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Primary Mucosal Melanoma: Uncommonly Described Entity

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Abstract

Because of rarity and clinical challenges arising from different anatomic location, our understanding of optimal management of mucosal melanoma remains limited. The most common sites for primary mucosal melanoma are head and neck followed by anorectal, and vulvovaginal regions. Data are limited but improved understanding has led to change in management from more radical excision to conservative surgery with negative margins. We try to summarize available evidences for management this uncommonly described entity.

Keywords: Primary mucosal melanoma; Head and neck malignant melanoma; Anorectal malignant melanoma; Vulvovaginal malignant melanoma; Malignant melanoma of mucosa

Background

Malignant melanoma arises by malignant transformation of the normal melanocytes. Distribution of malignant melanoma includes cutaneous (91.2%), ocular (5.3%), mucosal (1.3%), and unknown primary site (2.2%) [1]. Because of rarity and clinical challenges arising from different anatomic location, our understanding for the optimal management of mucosal melanoma remains limited. Malignant melanoma can arise from the mucosal epithelium of respiratory, alimentary, and genitourinary tracts, all of which contain melanocytes. The most common sites for primary mucosal melanoma include head and neck followed by anorectal, and vulvovaginal regions (55, 24, and 18%, respectively). Rarer sites are urinary tract, gallbladder, and small intestine.

Although melanocytes share same embryologic origin, mucosal melanomas behave more aggressively and have many different characteristics compared to cutaneous melanomas. Mucosal melanomas are multifocal in 20% cases, while cutaneous melanomas are multifocal in 5% [2,3]. 40% of mucosal melanomas are amelanotic, while <10% of cutaneous melanomas [3]. In the following section we described this uncommonly presented entity. 5 year survival for mucosal melanoma is 25%, while that for cutaneous melanoma it is 80.8% [1].

Etiopathogenesis

Mucosal melanoma arises in non-sun exposed parts of the body and risk factors are not properly defined. Incidence increases with age and > 65% of patients are older than 60 years [4]. The difference between white and black population is less pronounced compared to cutaneous melanoma and mucosal melanomas are approximately twice higher among whites compared to blacks [5]. The higher incidence in females compared to males is because of the predominance of genital tract melanomas in females, which account for 56.5% of mucosal melanomas among them [5]. There is no difference in rates between genders for extragenital mucosal melanomas.

For oral mucosal melanoma cigarette smoking has been suggested as a risk factor [6]. Formaldehyde has been implicated in sinonasal mucosal melanoma [7]. Genetic studies identified increased prevalence of c-KIT mutation and lower expression BRAF and NRAS oncogene mutation in mucosal melanoma compared with cutaneous melanoma [8,9].

Diagnosis and Staging

Whole body skin examination and ophthalmic examination are

important to exclude possibility of metastatic lesion from primary cutaneous or ocular melanoma and it is more important when diagnosing melanoma in sites, where it occurs uncommonly. To distinguish primary lesions from metastases Allen and Spitz identified junctional or in situ melanoma component with intact epithelium overlaying invasive melanoma as main diagnostic criteria for primary melanoma [10]. As diagnosis of mucosal melanomas is usually delayed and many lesions are ulcerated, this criterion is not easy to assess.

There is no uniformly accepted staging system for mucosal melanoma and varies depending on the primary site. A simplified staging system originally developed for head and neck melanoma can be applied to all cases of mucosal melanoma [11] (Table I).

Mucosal Melanoma of the Head and Neck

Presentation

Commonly occur in the nasal cavity (most commonly involving the turbinates and nasal wall) 55%, paranasal sinuses (most commonly maxillary and ethmoid sinuses) 15%, oral cavity (most commonly involving the hard palate and upper alveolus) 25% [12]. Uncommonly, it arises in pharynx, larynx, or esophagus [13-15]. Sinonasal mucosal melanomas present with nasal obstruction, epistaxis, or loss of smell [16]. Mucosal melanoma of the oral cavity presents as painless bleeding mass, an ulcerated area, mucosal discoloration, or ill-fitting dentures [17]. Regional lymph node involvement has been estimated to be present in 25% of oral cavity lesions and 6% sinonasal mucosal melanoma. Any suspicious lesion should undergo biopsy.

Staging

Workup includes clinical examination with endoscopic inspection for paranasal disease, CT and/or MRI of the primary site and CT and/or PET imaging to assess for lymph node involvement or distant metastases.

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The American Joint Committee on Cancer (AJCC) staging system for head and neck is used for this subset of disease and staging starts at stage III reflecting poor prognosis (Table II) [18].

Treatment

Wide local excision is the treatment of choice if R0 resection can be achieved. The surgical approach is same as for other common malignancies of that particular site. Local resection is followed by appropriate reconstruction. Therapeutic neck dissection is indicated in the presence of lymph node metastasis. Elective neck dissection in the presence of local disease only is not indicated. Sentinel node biopsy doesn't have an established role in the management of head and neck mucosal melanoma. Local recurrence occurs in 29-79% of cases even after despite aggressive surgical treatment [19-22].

Malignant melanoma are relatively radioresistant, but some studies have shown benefit [20,21]. Temam et al found local control rates of 26% with surgery alone and 62% with postoperative radiation therapy in 69 patients with mucosal melanoma [22]. Several series have reported improvement in local recurrence with adjuvant RT but no improvement in survival [23]. Role of RT has not been established in trials. Postoperative RT is usually indicated for positive surgical margins or narrow surgical margins and recurrent disease. Some centres routinely use postoperative RT if palpable lymph nodes or extracapsular extension present. RT is not used if lesions are close to the eye or central nervous system. Primary RT is applied to patients who are not candidates for resection and when adequate resection margin is not possible.

Prognosis of the head and neck mucosal melanoma is usually poor with 5 year survival rate of 12-30%. 10% have distant metastasis at presentation. Local recurrence occurs in 40% of nasal cavity lesions, 25% of oral cavity lesions, and 32% of pharyngeal tumours. Overall local recurrence occurs in 55% -66% and nodal recurrence in 16%-35%. Most of the recurrences occur within first 3 years [24]. Nodal involvement reduces median survival time of 18 months and multiple local recurrences are the most common cause of treatment failure. As per Memorial Sloan-Kettering Cancer Centre study independent prognostic predictors include stage at presentation, tumor thickness >5mm, vascular invasion, and distant failure are the only independent predictors of outcome of mucosal melanoma of the head and neck [18]. In localized lymph node negative primary mucosal melanoma microstaging according to invasion into tissue compartments are found to be a significant and independent predictor of poor survival (Table III).

Anorectal Malignant Melanoma

Presentation

Anorectal mucosal melanoma accounts for < 3% of all malignant melanomas and 0.05% of colorectal malignancies and <1% of all anal canal cancers [25,26]. Though risk factors are not identified, indirect evidence implicates human immunodeficiency virus infection as a risk factor [25]. Majority arises from mucocutaneous junction, but it can also arise from anal verge skin or rectal and anal mucosa. Lesions at or proximal to the dentate line present with more advanced disease due to delay in diagnosis, while lesions distal to the dentate line more commonly recurs within lymph nodes, which may represent differences in nodal drainage. Irrespective of location, the long-term prognosis remains poor in all cases of anorectal melanoma [26].

Anorectal melanoma present with bleeding, mass, change in bowel habits and occasionally as an incidental finding on pathologic evaluation of hemorrhoidectomy or anal polyp specimen. Regional lymph nodes are involved in 60% of patients at presentation, and distant metastases are present in 30% [27,28].

Staging

Work-up include rectal examination, rectal ultrasound, and CT and/or PET imaging to assess for distant metastases. AJCC doesn't include any specified staging system for anorectal melanoma, but a simplified system as described can be applied (Table I).

Treatment

Primary goal is to perform a sphincter preserving negative resection margin (R0) excision. Ross et al reviewed 32 patients with melanoma treated with either APR or local resection and concluded that local recurrence was lower in the APR group compared to local excision (29% vs 58%), however there was no difference in overall survival (19.5 months vs 18.9 months) [27]. Retrospective studies also confirmed comparable overall survival between APR and local excision [29,30]. Resection status and tumor stage were significantly associated with prognosis, but the type of resection (abdominoperineal resection or local excision) was not significant. Patients with positive surgical margins suffer inferior survival. Abdominoperineal resection is reserved for patients with bulky local disease, involved anal sphincter, anal incompetence and for selected patients with local recurrence. Inguinal lymphadenectomy is performed for clinically apparent disease in inguinal lymph nodes. Adjuvant RT has not shown improvement in overall survival. 5-year survival for R0 resection is 19% and for cases with involved margins is 5%. Factors adversely affecting prognosis in localized disease include perineural invasion, tumor size and thickness, and the presence of amelanotic melanoma.

Vulvovaginal Melanoma

Presentation

It occurs primarily in vulva (95%) and vagina (3%). Urinary bladder, urethra, or cervix is rare sites. Although vulvar melanoma is <1% of all melanomas, they represent 10% of all malignant tumors of the vulva [31]. Chronic inflammatory disease, viral infections, chemical irritants, and genetic factors have been implicated as risk factors [32]. Vulvovaginal melanoma commonly presents with pruritus, vaginal bleeding, a vaginal discharge, dyspareunia, or a mass.

Staging

Work-up includes clinical assessment with a pelvic examination, CT and/or MRI of the primary site and CT and/or PET imaging for distant metastasis. Vulvar melanoma is staged according to AJCC TNM classification for cutaneous melanoma [33]. No staging system has demonstrated prognostic accuracy for vaginal melanoma. Previously described simplified clinical staging system can be used for the purposes of standardization (Table II); however its prognostic utility is limited.

Treatment

Vulvar Melanoma: Wide local excision with negative margins is the adequate treatment and it has replaced the more radical surgeries. Melanomas <1 mm thick should be treated with at least 1 cm skin margins and for thicker melanoma margins can be extended up to 2 cm [34]. The excision should incorporate all layers of skin and subcutaneous tissues and extends upto muscular fascia below. Radical vulvectomy is reserved for large tumors and inguinal lymphadenectomy is done in the presence of nodal disease. Even after extensive surgery prognosis is poor in advanced cases.

Vaginal Melanoma: achieving wide local excision with negative margins can be difficult without pelvic exenteration because of multifocality and anatomical constrain. Whenever possible, wide excision with negative margins is adequate. There may be a role of adjuvant RT in selected cases.

Patients with vulvar melanoma have 5-year survival rates of 24-

Table I: Staging System Mucosal Melanoma.

Stage I	Clinically localized disease
Stage II	Regional nodal involvement
Stage III	Distant metastatic involvement

Table II: AJCC Staging Primary Mucosal Malignant Melanoma-Head and Neck.

T3	Mucosal disease
T4a	Moderately advanced disease Tumor involving deep soft tissue, cartilage, bone, or overlying skin
T4b	Very advanced disease Tumor involving brain, dura, skull base, lower cranial nerves (IX, X, XI, XII), masticator space, carotid artery, prevertebral space, or mediastinal structures
Nx	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastases
N1	Regional lymph node metastases present
M0	No distant metastasis
M1	Distant metastasis present
Stage Grouping	
Stage III	T3, N0, M0
Stage IVA	T4a, N0, M0, T3-T4a, N1, M0
Stage IVB	T4b, Any N, M0
Stage IVC	Any T, Any N M1

Table III: Microstaging in Lymph Node Negative Primary Mucosal Malignant Melanoma.

Level 1	Melanoma in situ
Level 2	Invasion in the lamina propria only
Level 3	Invasion into deep tissue

77% and those with vaginal melanoma have 5-year survival rates of 5-25% [35].

Other rare sites have also been reported for primary mucosal melanoma. These include esophagus, stomach, small and large bowel and lungs. Surgery with negative margins remains adequate treatment, but prognosis is poor.

Role of Systemic Therapy

Data are limited on the role of adjuvant systemic therapy in mucosal melanoma. High dose interferon (HDI) alpha has been approved for treatment of stage III cutaneous melanoma. Only data on the efficacy of adjuvant systemic therapy for mucosal melanoma are from a Chinese phase II randomized trial of interferon versus chemotherapy. In this study both temozolomide based chemotherapy and HDI were effective and safe as adjuvant therapies for the resected mucosal melanoma as compared with observation alone. However, relapse free survival was better with temozolomide-based chemotherapy compared to HDI. These results should be replicated in a larger population study before general recommendation [36].

The anti-CTLA4 monoclonal antibody ipilimumab has been shown to significantly prolong survival in some patients with cutaneous melanoma, but there are no randomized trials in mucosal melanoma. Targeted treatment against BRAF and KIT mutation may provide additional treatment options in some cases, but data are limited [37].

Conclusion

Wide local excision with negative margins is the standard of treatment for mucosa malignant melanoma and gives best chance of cure. Mucosal melanoma of head and neck are approached in the same way as head and neck squamous cell carcinoma. Wide local excision with negative margins has replaced more radical pelvic exenteration for vulvovaginal melanoma and abdominoperineal resection for anorectal

melanoma. Regional lymphadenectomy is indicated in presence of clinical evidence of disease in lymph nodes. There is role of sentinel lymph node biopsy in vulvar malignant melanoma. Adjuvant RT may offer improved local control in selected patients with margin positive or recurrent disease, but improved overall survival has not been demonstrated. KIT inhibitors may have potential role as targeted therapy in future. Distant metastases are managed in the same way as cutaneous malignant melanoma.

Conflict of interests

Authors have no conflict of interests to declare

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Can Single Incision Laparoscopic Appendectomy Replace the Traditional Three Port Laparoscopic Approach in Coming Future: A Review

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Abstract

In this modern era, the major aims of most of the GI surgeons have been a minimal invasive approach towards surgery, thereby reducing the various complications associated with the surgery. Till now open appendectomy has been practiced a lot for the treatment of acute appendicitis. The 3port laparoscopic approach is widely used and now considered as a gold standard treatment for acute appendicitis currently the 3-port laparoscopic appendectomy. In recent years, laparoendoscopic single site surgery (LESS) has become a major focus of study, with even difficult procedures achieved using this technique, which uses a single port, rather than the traditional 3-ports for the removal of the diseased appendix laparoscopically known as Single Incision Laparoscopic Appendectomy (SILA). This is a comparatively minimal approach towards surgery as minimal invasive surgery. Therefore the purpose of this review is to compare the outcomes of SILA versus traditional 3-port laparoscopic appendectomy and hence giving an idea of whether SILA is an alternative to replace the traditional approach as the new treatment of choice in coming future.

Keywords: Laparoendoscopic single site surgery; Single incision laparoscopic appendectomy; Single incision laparoscopic surgery; 3 Port laparoscopic appendectomy; Natural orifice transluminal endoscopic surgery; Minimal invasive surgery

Abbreviations: LESS: laparoendoscopic single site surgery; SILA: Single Incision Laparoscopic Appendectomy; SILS: Single Incision Laparoscopic Surgery; 3PLA: 3 Port Laparoscopic Appendectomy; NOTES: Natural Orifice Transluminal Endoscopic Surgery; MIS: Minimal Invasive Surgery

Introduction

Medicine is an ever-changing and ever-growing field where day after day and year after year new things are invented, applied for the treatment of various diseases. In the line of treatment, surgery has been one of the feared treatment options for most of the patients; therefore surgeons try to provide the patients with the best possible surgical treatment options. The best possible surgical option has always been the one with the lesser complications intra and postoperatively, well-controlled pain, less stay at hospital etc. Both doctors and patient don't want to maximize hospital stay as one study stated that extended hospital stay has been associated with increased incidence of hospital acquired infections, which causes further increase in morbidity and mortality [1]. One of the greatest achievements in the history of surgery has been evolved from open surgical techniques to the operative video-laparoscopy

Acute appendicitis is one of the most common cause of acute abdomen and one of the most common surgical emergencies. Appendectomy for acute appendicitis is one of the most commonly performed surgical procedures [2]. The surgical technique of first open appendectomy (OA) was performed by Dr. Charles Mcburney in and this approach has not significantly changed in the last 1 century [3]. In 1983, Dr. Kurt Semm, performed first minimally invasive laparoscopic appendectomy, thereafter LA has become the standard of practice in uncomplicated appendectomies in most minimally invasive institution [4]. In the past few years of minimally invasive surgery, LESS, NOTES has gained popularity. SILA was first described in 1998 by Esposito and has gained popularity as a method with a concept of "scarless" abdomen [5]. While Pelosi in 1992 performed the first SILA for acute appendicitis [6]. Innovative methods such as NOTES (Natural Orifice

Tran luminal Endoscopic Surgery) and single incision laparoscopy (SIL) have demonstrated promissory results in various surgical procedures, appendectomy among them [7]. According to a recent study, SILA resulted in faster recovery than conventional 3-port LA [8]. However in some other studies it has also been reported that SILS is associated with a longer operative time and higher postoperative pain scores, and that patients need more analgesics to feel comfortable [9]. NOTES, SILS, and robotic surgery do not constitute techniques, rather they are concepts, hence regarded as transitions from laparoscopic surgery to unknown fields of minimally invasive therapeutic modalities [10]. SILS was recommended as a possible alternative of the traditional laparoscopic surgery via four ports for the biliary tract by Navarra et al. [11]. With NOTES having a diminished success, because of the inability to find a clean site for access, thereby increasing the chances of intra-abdominal spillage or infection from the incision [12] increased interest has been seen in SILS. SILS occupies a space between NOTES and standard laparoscopy [13]. There have been several studies regarding comparison between the SILA and 3PLA and to evaluate the possible advantage and disadvantages between them. Therefore the purpose of this article is to review and assess the outcomes and results related to SILA and 3PLA thus have an idea that whether SILA can be replacement for 3PLA in coming years.

Discussion

Minimal invasive surgery has continued to evolve, with a focus on improving cosmetic results and others potential benefits regarding

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postoperative outcomes and to reduce surgical trauma. Both techniques have their own advantages and disadvantage. A comparison of outcomes between both techniques is required to be looked into.

Cosmetic

One of the commonly seen advantages of SILA over 3PLA is the reduction in incisions needed. Where in SILA there is a single about 2 cm intraumbilical skin incision from which SILS port is inserted while other two 10-mm and two 5 mm trocars were inserted from the same port. While in 3PLA there is need for three incisions; two 5 mm ports and one 10 mm port [14]. In a study of scar comparison by both SILA and traditional 3-port by Ceci et al. [15] it was concluded that the former was found to reduce scars, thus it is advantageous from cosmetic improvement. Another study by Teoh et al. [16] concluded that the LESS approach resulted in better cosmetic scores and satisfaction scores than 3-PLA. Most researchers found that the cosmetic scores given by patients undergoing SILA was higher than that given by patients undergoing the 3PLA [17,18]. Conversely, according to study conducted by Lee et al. [19], reported that the cosmetic satisfaction score and postoperative pain scores were not significantly different between SILA and 3-port LA. According to these studies, patients were more satisfied with the cosmetic appearance of SILA over 3PLA.

Operative time

As SILA is considered to be a relatively less used technique, it is essential to understand the learning experience of the surgeons and how the operative time changes with experience. According to the studies conducted by Teoh et al., Pan et al., Carter et al., Vilallonga et al., Kye et al. and Frutos et al. [16,18,20-23] the results showed that SILA was associated with significant longer operative times than 3-port LA. More time is needed for performing SILA than 3PLA may be due to the characteristic single incision of SILA technique would increase its technical difficulty because all surgical procedures have to be performed in one working channel [18,24]. However in the study conducted by Ahmed et al. [25] showed that SILA which took 74 minutes to complete the operation was quicker than traditional 3-port which took 89 minutes with the total operation time being 15 min shorter. The shorter operating time observed in SILA may be due to more experienced surgeons in the SILA group. Interestingly though, in another study conducted by Mutter et al. [26] stated that even though the surgeons with experience performed more rapidly, there was no significant difference. But the study by Tay et al. [27] reported that a second surgeon showed faster improvement on mentoring from the first surgeon. Overall, the learning curve is said to be quite short [28]. The technical change from conventional to single-port LA requires a learning curve of at least 10 surgeries for a basic handling of SILA [29]. Therefore with more experience, the time required for the operation significantly decreases.

Length of hospital stay

Shortening the stay in the hospital is one main concern of the patient and patient party and is beneficial to both hospital and patient, as it reduces costs also. As one study by Adolfo et al. [30] showed the mean postoperative hospital stay was shorter in the SILA group than in the 3PLA group but the difference was not significant. Other studies though, didn't find a much significant difference in hospital stay [20,23,31,32]. However some studies regarding SILC was said to have a significantly shorter stay in the hospital [33]. This was supported by a few other studies [34,35]. So among different studies done the LOS between SILA and 3PLA has not much difference.

Post-operative pain

Pain is one of the main concerns for patients after surgery. In order for patients to return back to their daily activities, postoperative

pain needs to be less. Less post-operative pain also allows less use of analgesics. In the study conducted by Carter et al. [20] showed the SILA patients reported a mean pain score of 4.4 of 10 in the first 12 hours after surgery, compared with 3.5 for 3-port patients. A visual analog scale was used from 0-10 in which 0 refers no pain whereas as 10 refers to severe pain in ascending order. In another study Post-surgery pain was measured using the VAS scale (0-10), with higher readings for SILS with a statistically significant difference, SILA=4, 3PLA=3.3 [23]. In contrary other study by Ahmed et al. [25] showed patient have slightly less pain following SILA; comparison to 3-PLA. However, this was not statistically significant in which SILA group required less morphine in recovery. Another two study reported significant difference on pain score in favor of the SILA group during the first 24 h [21,22]. Teoh et al. [16] described no significant differences in pain score when evaluated at rest but a decrease in this score in the CLA group during coughing and standing. As many patients felt pain after surgery, it is difficult to conclude precisely on whether or not there is less post-operative pain. More study is required in this area.

Complications

During or after surgery both doctors and patient don't want any complication, which could lengthen the hospital stay and could affect the normal life after operation. The most frequently reported surgery-related complications were wound infection, prolonged postoperative ileus, incisional hernia, intra-abdominal infection, stump leakage etc. According to study done by villabos et al. [36] there were 2 intra-abdominal abscess cases requiring hospitalization for IV antibiotics for SILA group, and only 1 case for 3PLA. Other complications such as postoperative ileus or surgical wound infection, among others, showed no significant differences. Peters et al. [37] stated that there was no significant difference in wound infection between the SPILA group (6/180) and the three-port group (3/180). A single patient suffered an intra-abdominal abscess, occurring in the three-port group. According to the several studies conducted by Teoh et al., Frutos et al., Sozutek et al. and Lee et al. [14,16,19,21] showed patient complications were similar between groups the results for SILA and 3PLA groups revealed no significant difference despite some fewer complications in each groups.

Conversion (to additional port or Open)

During the course of surgery every surgeon wants to finish the surgery without any complication or difficulty but due to some unavoidable circumstances surgeon need to convert the operation for example difficult and unclear anatomy, intra operative bleeding that can't be tackled by existing procedure etc. In one study by Ahmed et al. out of 33 patients in SILA group 3 patients in the required an additional port, 2 patients underwent standard three port laparoscopic surgery, and 1 patient was converted to an open operation. While out of 34 patients the 3PLA group, 2 patients required an additional port and 2 patients were converted to an open operation. Another study Carter et al. showed 1 case of SILA need to be converted which required 2 additional port due to intra operative complication. While in 3PLA group this is no any conversion. Others studies Sozutek et al., Teoh et al. and Frutos et al. [14,16,21] regarding conversions reported that there was not significant difference in the conversion rates among two groups. Sozutek et al. [14] in their studies stated that considering results of patients with complicated appendicitis treated with SILA and 3PLA, both methods may be applicable in experienced hands. As in all laparoscopic operations, insufficient exposure due to severe inflammation or dense adhesions is always the main indications for open conversion or additional port. Conversion should be considered as a surgical decision and not a complication.

Cost

Although not many studies have clearly stated about the cost difference between SILA and 3PLA, one meta-analysis conducted by

Jun Gao et al. [17] reported that the use of additional device makes SILA more expensive than 3PLA.

In a comparison of costs, it is said that SILC is more expensive than traditional 4 port laparoscopic cholecystectomy [38,39]. In another study Bucher et al. [40] surgeons tried to reduce the cost by reusing material. According to the study conducted by Lee et al. cost was significantly lower in the SILA group compared with the CLA group because of using a unique “single-port”, that could reduce the number of trocars, generally 3 trocars were needed for CLA and 1 trocar for SILA [41]. However, it must be noted that the surgical techniques differed among the included studies in terms of the type of umbilical port (triport vs. “homemade”) and straight versus curved instruments. These differences impact the cost of SILA significantly [42]. The study conducted by Seung Min Baik et al. [43] showed no any significant difference in the cost comparisons between the two groups. (SILA \$1,527 ± 218.3 and 3PLA \$1,549 ± 119.8)

Conclusion

In the current era of modern surgery SILS represents a new technique in minimally invasive surgery and has been applied to various abdominal operations aiming to reduce the trauma of surgical access and improving cosmesis. Paul Buckley 3rd et al. [44] in their study concluded that Single-incision laparoscopic (SILS) surgery has emerged as an alternative to 3-PLA, with some advantages in terms of patient satisfaction and cosmesis and SILA performed by experienced surgeons have shown similar postoperative outcomes as 3PLA. SILA is a safe technical alternative to 3PLA for patients with appendicitis. Some studies have shown that SILA has the advantage of shorter hospital stay and it can achieve comparable operative time, blood loss, postoperative recovery, postoperative pain and complications with 3 port laparoscopic [45]. SILA is feasible technique and represents a possible alternative to conventional laparoscopic appendectomy as it does not increase the rate of complications. However Jun gao et al. [17] in their study reported that SILA should not yet be considered the gold standard for appendectomy as long term data on outcome are lacking.

Hence, SILA is a procedure still in the progress of being superior to traditional 3 port in the field of minimally invasive surgery for the treatment of acute appendicitis and many more studies should be conducted in large scale to see if SILA can replace 3PLA in future.

Conflict of interests

Authors have no conflict of interests to declare

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“Hungry Bone” Syndrome after Parathyroidectomy: Up-To-Date

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Abstract

The hungry bone syndrome is considered in literature as being a complication following parathyroidectomy and it refers to the rapidly installed, severe, prolonged, and in most cases clinically manifested hypocalcaemia, which is sometimes accompanied by hypophosphatemia and hypomagnesemia. It appears due to the rapid demineralization of the dystrophic bone as a result of the sudden drop in the seric level of the parathyroid hormone. The prevalence of this complication is reported in literature with different variations, the number reported ranging from 4-95% depending on the type of affection - i.e. primary hyperparathyroidism or renal secondary hyperparathyroidism, but also on the geographical areas where the respective reports have been filled. The high preoperative level of calcaemia, seric parathyroid hormone and alkaline phosphatase correlate statistically with the risk of postoperative hungry bone syndrome appearance; the elderly patients present a higher risk for this complication, increasingly because this category of patients is oftenly associated with D hypovitaminosis and insufficient intake of nutritional calcium. The syndrome semiology is one of a hypocalcaemia and the curative treatment is initially a symptomatic one of fighting the severe postparathyroidectomy hypocalcaemia and only later a pathogenic one, aiming to remineralize the dystrophic bone. The purpose of this review is to describe the main epidemiologic, physiopathologic and clinical aspects of hungry bone syndrome but also of presenting prevention and treatment methods for this complication of parathyroidectomy.

Keywords: Parathyroidectomy; Hypocalcaemia; Hyperparathyroidism; Hungry bones syndrome

Introducere

O paratiroidectomie reușită, indiferent de tehnica folosită, este urmată de scăderea brutală a nivelului de parathormon seric (iPTH), care antrenează în subsidiar o modificare uneori dramatică a fluxurilor ionice osteo-plasmatic preoperatorii [1]. Hipocalcemia moderată și tranzitorie este frecvent întâlnită în primele 3-4 zile după paratiroidectomie, fiind de regulă independentă de gravitatea hiperparatiroidismului preoperator [2-4].

Sindromul “hungry bone” (SHB) este interpretat în literatură ca o complicație a paratiroidectomiei și se referă la hipocalcemia rapid instalată, severă, prelungită și de cele mai multe ori manifestă clinic, însoțită uneori de hipofosfatemie, hipomagnezemie, ce apare datorită remineralizării rapide a osului distrofic ca rezultat al scăderii bruste a nivelului seric al parathormonului [1,3-5]. Acest sindrom este descris atât după paratiroidectomiile efectuate în tratamentul hiperparatiroidismului primar cât și a celui secundar de origine renală; practic determinismul hipocalcemiei este similar în ambele afecțiuni, dar riscul hipocalcemiei postoperatorii severe și prelungite este mai mare la dializatul cronic, datorită distrofiei severe osoase frecvent întâlnită la această categorie de pacienți [6]. Un sindrom similar dar mai puțin sever poate apare și după tratamentul chirurgical al hipertiroidismului asociat cu boală osoasă [1,7]; spre deosebire de SHB după paratiroidectomie în acest caz valorile iPTH sunt crescute [1,7,8]. În literatură sunt citate și alte cauze de hipocalcemie prelungită după paratiroidectomie, explicată prin îndepărtarea intenționată sau accidentală a tuturor paratiroidelor, devascularizarea paratiroidelor restante, supresia postoperatorie a acestora [6,9,10].

Scopul acestui “review” este de a descrie principalele aspecte epidemiologice, fiziopatologice și clinice ale SHB dar și a modalităților de prevenție și tratament a acestei complicații a paratiroidectomiei. În elaborarea prezentului material am folosit atât datele din literatură pe această temă pe care le-am discutat însă și din perspectiva experienței noastre în tratamentul chirurgical al ambelor afecțiuni.

Date epidemiologice și importanța problemei

Prevalența SHB este diferit raportată de literatură, cu cifre cuprinse între 4-95%, în funcție de tipul afecțiunii i.e. hiperparatiroidism primar (1HPT) sau secundar renal (2HPT), dar și de zonele geografice unde s-au efectuat respectivele raportări [6,11-14]. Hipocalcemia severă după tratamentul chirurgical al 1HPT are o incidență medie estimată de 12% [15]. În general acest sindrom este mai rar întâlnit în țările vestice, datorită depistării 1HPT în faza sa subclinică, oligosimptomatică, înaintea instalării complicațiilor evolutive ale bolii, în special a celor osoase [1,16,17]; în aceeași zonă geografică, complicația este mai rar întâlnită și după tratamentul 2HPT, datorită tratamentului mai eficient și precoce al afecțiunii de bază i.e. insuficiența renală cronică terminală, inclusiv prin transplant renal [18]. Latus et al. [6], într-un studiu pe 84 de pacienți cu 2HPT, identifică complicația la peste 50% din cazuri (51.2%), aceste date fiind similare [19] sau mai mari decât ale altor autori [20]. Diferențele pe care le constatăm în raportarea incidenței și prevalenței SHB pot fi explicate prin criteriile clinice și paraclinice diferite utilizate pentru definirea acestei complicații dar și prin lipsa standardizării protocoalelor de tratament pre și postoperator [5,6,20].

În literatura autohtonă există câteva studii ce descriu experiența unor centre în tratamentul hiperparatiroidismului primar sau a celui secundar de origine renală, dar nu am găsit date suficiente legate de incidența SHB [18,21-24].

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Etiopatogenia sindromului “hungry bone”

Mecanismul patogenic al SHB nu este încă pe deplin lămurit; explicarea lanțului fiziopatologic al complicației pleacă de la boala osoasă (osteitis fibroasă) asociată frecvent hiperparatiroidismului. Remodelarea osoasă este un proces continuu de-a lungul vieții, desfășurat în spiritul unui echilibru dintre activitatea osteoclastică de resorbție a osului și cea osteoblastică, de refacere a acestuia [1,4,6]. În hiperparatiroidism secreția crescută de parathormon alterează la nivel osos echilibrul dintre activitatea osteoblastică și cea osteoclastică în favoarea celei din urmă, consecința fiind demineralizarea treptată cu riscul de apariție a deformărilor osoase și fracturilor patologice [6,20]. Paratiroidectomia, prin reducerea brutală a secreției de parathormon, întrerupe abrupt acest lanț fiziopatologic; activitatea osteoclastică încetează brusc, cu menținerea și chiar accentuarea activității osteoblastice [1,6,8,20]. Se produce ca urmare o schimbare de direcție a fluxurilor osteo-plasmatice fosfo-calcice, în sensul remineralizării rapide a osului distrofic (resorbție fosfocalică), cu scaderea uneori severă a concentrației acestor ioni la nivel plasmatic. Hipocalcemia din primele 2-4 zile postoperator este o consecință frecventă a unei paratiroidectomii reușite, lipsa acesteia punând sub semnul întrebării chiar calitatea intervenției [1,20]. Sindromul „hungry bone” a fost definit pentru prima dată de către Brasier și Nussbaum în 1988 [5], ca fiind prelungirea hipocalcemiei (calciul seric <8.5 mg/dl) și hipofosfatemiei (fosfor seric <3.0 mg/dl) postparatiroidectomie peste intervalul anterior menționat, până la săptămâni sau chiar luni de la intervenție [25]. Durata SHB se confundă cu durata hipocalcemiei postoperatorii, practic cu durata necesară remineralizării osoase până la normalizarea turnover-ului osos [1,5,20,25]. Gravitatea acestui sindrom a fost asociată atât cu durata afecțiunii primare i.e. hiperparatiroidismul [26] cât și cu severitatea distrofiei osoase [27].

Factori de risc ai apariției SHB

În ceea ce privește factorii de risc ai complicației, găsim în literatură diferențe uneori majore între 1HPT și 2HPT. Legat de 1HPT, mai multe studii au arătat că nivelul preoperator crescut al calcemiei, parathormonului seric și fosfatazei alcaline se corelează statistic cu riscul de apariție a SHB postoperator [1,5,28,29]; modificările preoperatorii ale altor parametrii biochimici i.e. hipomagnezemia, hipovitaminoza D, hipoalbuminemia, par a se asocia și ele statistic cu riscul de dezvoltare a complicației la aceasta categorie de pacienți [1]. Brassier și Nussbaum [5], studiind fenomenul pe un lot de 198 de paratiroidectomii pentru 1HPT, arată că pacienții vârstnici prezintă un risc crescut pentru apariția acestei complicații, cu atât mai mult cu cât această categorie de pacienți asociază frecvent hipovitaminoza D și aportul insuficient de calciu alimentar [1].

Dar poate cel mai important factor de risc este prezența bolii osoase înaintea paratiroidectomiei, SHB fiind remarcat postoperator la majoritatea cazurilor cu modificări radiologice preoperatorii de tipul osteitis fibroasă, tumori brune sau fracturi patologice [5,28]. Alți factori de risc discutați sunt volumul și greutatea paratiroidelor rezecate [30]; am remarcat și noi aceasta corelație pe un lot de 45 de paratiroidectomii efectuate pentru hiperparatiroidism renal (observație nepublicată). Mai mult, într-un caz de paratiroidectomie pentru un adenom paratiroidian gigant (aprox 30 g) am notat postoperator un sever SHB ce a necesitat reinternarea pacientei și administrarea unor doze importante de calciu gluconic intravenos [31]. Nu am găsit în literatură corelații între modificările patologice ale paratiroidelor rezecate și riscul de apariție a SHB [1,3,5,24].

Goldfarb et al. [20], studiind retrospectiv 79 pacienți paratiroidectomizați pentru 2HPT refractar, identifică doar doi factori de risc asociați statistic cu apariția SHB și anume vârsta mai tânără la momentul operației și hipocalcemia preoperatorie, ceilalți parametri analizați i.e. fosfatemia, valorile iPTH, uree, hemoglobină, durata dializei neavând

asocieri semnificative statistice, observații similare fiind raportate și de alți autori [6,32].

Tabloul clinic, biochimic și imagistic al SHB

Semiologia SHB este cea a unei hipocalcemii, obiectivate prin valori ale calciului seric sub 8 mg/dl; simptomele pot fi moderate, traduse clinic doar printr-o senzație de slăbiciune sau severe. În această ultimă situație alterarea excitabilității neuro-musculare se traduce prin spasme carpedale, parestezii periorale și ale extremităților, pozitivarea semnelor de hipocalcemie (Cvostek, Trousseau) [1,5,6,10]. În aceste forme severe pot apare convulsii generalizate cu fracturi patologice, stare comatoasă, insuficiență cardiacă acută, tulburări majore de ritm cardiac cu risc de deces [1]. Indiferent de forma clinică a bolii inițiale (hiperparatiroidism primar sau secundar) hipocalcemia severă postoperatorie este o urgență ce impune reinternarea pacientului, monitorizarea atentă a ionogramei (calcemie dar și fosfor, magneziu seric și corectarea adecvată a acestora), monitorizare cardiologică; complicația asociază de regulă creșterea duratei de spitalizare, inclusiv în secția ATI și creșterea costurilor [6].

Laboratorul evidențiază valorile persistent scăzute ale calcemiei însoțite de hipofosfatemie, eventual hipomagnezemie; iPTH seric scade constant în limitele normale sau de multe ori sub 10 pg/ml, traducând biochimic un hipoparatiroidism. La primul lot de 24 de pacienți operați de noi pentru 2HPT, la care am practicat paratiroidectomie subtotală cu autoimplant suprasternal pe pedicol vascular, am remarcat o scădere medie a iPTH-ului seric de 150 de ori față de valorile medii preoperatorii [24]. Smith et al [33] descrie un caz interesant de SHB după o paratiroidectomie pentru 1HPT dar fără hipocalcemie postoperatorie, diagnosticul complicației fiind confirmat evolutiv prin măsurări postoperatorii ale densității osoase; autorii explică fenomenul prin efectul pe care hipocalcemia l-ar avea asupra celorlalte paratiroide indemne, cu stimularea secundară a secreției de parathormon (hiperparatiroidism secundar) și corectia calciului seric. Valoarea fosfatazei alcaline serice (AlkPhos) ca și a altor markeri de biosinteză osoasă este constant crescută, marturie a unui turnover osos crescut [1,5,6,20], menținându-se ca atare mai multe luni postoperator. Zamboni și Folse [30] arată că valoarea preoperatorie a AlkPhos poate fi considerată un indicator predictiv al severității hipocalcemiei postoperatorii după paratiroidectomie pentru 1HPT; în același studiu pe 24 pacienți cu 2HPT [24] amintit anterior am găsit corelații semnificative între valoarea preoperatorie a AlkPhos și nivelul calcemiei postoperatorii, în sensul că există o clară relație negativă între constantele. e. o valoare crescută a AlkPhos preoperator este un factor predictiv al unei calcemii postoperatorii scăzute. Se consideră că SHB durează atât timp cât este necesar pentru ca markerii turnover osos (în primul rând AlkPhos) să se normalizeze, modificările radiologice de tip “osteitis fibroasă” să dispară iar indicii densității osoase să se normalizeze [1,4,5,15].

Modificările radiologice sugestive pentru afectarea osoasă hiperparatiroidiană constau din resorbții superiostale, sechele ale unor (multiple) fracturi patologice, osteoporoză, leziuni litice tip tumori brune, toate grupate ca “osteitis fibroasă cystica” [1]. Corelația între prezența acestor modificări radiologice preoperatorii și riscul de apariție postoperatorie a SHB este semnificativă statistic, 47-100% din pacienții cu boală osoasă de origine hiperparatiroidiană dezvoltând postoperator complicația [11,29]. Paratiroidectomia este urmată de remineralizarea treptată a osului distrofic, demonstrabilă atât imagistic (radiologic și/sau scintigrafic) sau prin măsurători ale densității osoase.

Prevenția și tratamentul SHB

Tratamentul preventiv al sindromului “hungry bone” este de preferat și se adresează grupei de pacienți cu risc crescut. Având în vedere determinismul aparent între gravitatea distrofiei osoase

preoperatorii și riscul de apariție a hipocalcemiei severe postoperatorii, se discută despre rolul tratamentului preoperator cu biofosfonați în prevenția complicației, fiind cunoscut efectul inhibitor al acestora asupra activității osteoclastice. Deși lipsesc studiile randomizate care să confirme eficiența acestei terapii, se pare că administrarea preoperatorie prelungită a biofosfonaților, până la remineralizarea osoasă și cvasinormalizarea AlkPhos, ar putea preveni apariția SHB [34-37]. Având în vedere că hipovitaminoza D este un factor de risc al SHB, că peste 2/3 din pacienții cu IHPT prezintă hipovitaminoza D preoperator [15] și administrarea calcitriolului poate fi utilă în prevenția complicației, dar nici acest aspect nu este confirmat prin studii randomizate; Smith et al. [33] notează că tratamentul preoperator cu Vit D timp de 5-10 zile previne apariția SHB.

Tratamentul curativ sindromului "hungry bone" este inițial unul simptomatic, de combatere a hipocalcemiei severe postparatiroidectomie iar ulterior patogenetic, urmărind remineralizarea osului distrofic [26,33,34]. În faza de debut a complicației dozele de calciu necesare menținerii unei calcemii în limite normale sunt prea mari pentru a putea fi tolerate pe cale orală, fiind necesară administrarea intravenoasă; tratamentul asociază constant analogi metabolici activi ai vitaminei D, cu atât mai mult cu cât hipovitaminoza D este frecvent întâlnită la această categorie de pacienți [30,33]. Cantitatea de calciu administrată în această perioadă "acută" poate fi foarte mare, până la 12g/zi; în aceste situații este necesară spitalizarea pacientului (amânarea externării sau re-internarea), cu monitorizarea frecventă a ionogramei (calciu, fosfor, magneziu seric) dar și monitorizarea cardiologică, hipercalcemia putând fi cauza unor severe tulburări de ritm cardiac [23,25]. Noi preferăm administrarea calciului gluconic în microperezuzii pe calea unui cateter venos central, pentru a evita unele complicații locale (necroze cutanate, iritații etc). În situația în care este prezentă hipomagnezemia este necesară și compensarea acesteia, pe cale intravenoasă (sulfat de magneziu) mai rar intramusculară sau orală; hipocalcemia nu poate fi corectată atâta timp cât magneziul seric este scăzut [36].

Tendința spre normalizare a calcemiei cu scăderea necesarului de calciu intravenos poate constitui momentul trecerii la substituția orală; preparatele de calciu ce se găsesc în comerț conțin doze active diferite, preparatele de calciu carbonic având dozele cele mai mari de calciu elementar per tabletă. Tratamentul curativ al SHB durează până în momentul în care investigațiile de laborator și imagistice, măsurarea densității osoase certifică remineralizarea completă; în unele situații aceasta poate continua mai multe luni după paratiroidectomie.

Concluzii

Sindromul "hungry bone" este o complicație uneori severă ce poate apare după paratiroidectomiile efectuate pentru hiperparatiroidism primar sau secundar (renal). Sindromul se manifestă clinic prin semniologia unei hipocalcemii (uneori severe), ce necesită nu de puține ori reinternarea, monitorizarea atentă și corectarea deficitelor ionice. Prevenția acestei complicații este dificilă, intrând în discuție tratamentul cu biofosfonați sau calcitriol. În faza "acută" se impune administrarea unor doze importante de calciu IV; tratamentul se poate prelungi de-a lungul mai multor luni postoperator și constă în administrarea preparatelor orale de calciu și a derivaților vitaminei D.

Conflict de interese

Autorii nu declară niciun conflict de interese.

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Quality of Life Improvement after Surgery for Deep Infiltrating Endometriosis (DIE)

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Abstract

Endometriosis is categorized as one of the chronic benign gynecologic diseases, which causes pelvic pain and infertility, affecting almost 10% of reproductive-age women. Deeply infiltrating endometriosis (DIE) is a specific entity of endometriosis, responsible for painful symptoms, which are related to the anatomic location of the lesions. In this paper, we aim to review the current literature regarding the post-surgery quality of life improvement for DIE. Irrespective of its low sensitivity and specificity, vaginal examination and evaluation of specific symptoms should be emphasized as a basic diagnostic tool in detecting endometriosis. This will help in planning further DIE related therapeutic interventions. Out of several, transvaginal ultrasound (TVUS) has been reported as one of the widely used and excellent tools to diagnose DIE lesions in different locations (rectovaginal septum, retrocervical and paracervical areas, rectum and sigmoid and vesical wall).

Keywords: Deep infiltrating endometriosis; DIE; Quality of life; QOL; Preoperative evaluation

Background

Endometriosis is a painful and chronic gynecologic disorder, characterized by the presence of ectopic endometrium outside the endometrial cavity. Under this situation endometrial cells are implanted ectopically, that lead to retrograde menstruation via the fallopian tubes into the pelvis [1]. Endometriosis affects at least 6.3 million women and girls predominantly of reproductive age in the United States, 1 million in Canada, and millions more worldwide. It is associated with pelvic pain and infertility [2]. Peritoneal endometriosis, ovarian endometriosis and DIE are the three clinical presentations of endometriosis that have been described before [3]. Furthermore, several classifications of DIE have been proposed. In one classification, three different types of DIE are distinguished [4]:

(I) A large lesion in the peritoneal cavity, infiltrating conically with the deeper parts becoming progressively smaller is designated as type-1;

(II) In type-2, the bowel is being retracted over the lesion, and becomes deeply situated in the rectovaginal septum without infiltrating it;

(III) Spherically shaped lesions, situated deep in the rectovaginal septum, and are often only visible as a small typical lesion at laparoscopy or often not visible at all. In the year 1995, Donnez and Nisolle have proposed only two types of DIE, first being caused by the invasion of a very active peritoneal lesion deep in the retroperitoneal space. In cases of lateral peritoneal invasion, utero-sacral ligaments can be involved as well as the anterior wall of the recto-sigmoid bowel junction resulting in a retraction, adhesions and secondary obliteration of the cul-de-sac. A second type is pseudo-DIE where the lesion originates from the rectovaginal septum tissue and consists essentially of smooth muscle with active glandular epithelium and scanty stroma [5].

Today it is believed that endometriotic lesions can penetrate deep either into the retroperitoneal space or into the walls of the pelvic organs [6]. However, the mechanism is not clear and little is known about the impact of the different types of surgery in the treatment of DIE on complications, pain, patients' quality of life (QOL), recurrence

rate and pregnancy rate or fertility. The aim of this review is therefore to evaluate the quality of life improvement after the different surgical modalities for management of DIE based on the above-mentioned parameters.

Material and Method

In this review we have searched The PUBMED (March 2005 to July 2015) for relevant articles. Heading terms "deep infiltrating endometriosis, quality of life" (n1=33) and "deep infiltrating endometriosis" (n2=402) were used. All pertinent articles were retrieved without any language restriction. To ensure the relevance of the publications, additional inclusion criteria were applied. We have included only those studies that contained a clear explanation of the surgical technique, an effectual evaluation of pain and an explicit description of post-operative QOL. To ensure a complete review of the preoperative evaluation of DIE, we have also included some of the most relevant studies regarding this subject, without any restriction.

Specific Symptoms of DIE

DIE exhibits a broad spectrum of clinical manifestations. DIE can be completely asymptomatic, or can become a disorder where quality of life is heavily compromised, as DIE is defined by the presence of endometrial implants, fibrosis and muscular hyperplasia under the

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peritoneum [7]. It may also involve, in descending order of frequency, the uterosacral ligaments, the rectosigmoid colon, the vagina and the bladder. DIE may cause severe dysmenorrhoea. However, pelvic pain may be more common in women with deep, infiltrating implants post-surgery. It is reported that, DIE induced pain is due to compression or infiltration of nerves in the sub-peritoneal pelvic space by the implants [8]. However, the intensity of pain in woman with DIE correlates well with the depth and volume of infiltration [9]. DIE induced painful symptoms is very organ specific, being present in precise anatomical locations. However, multifocality is also a major characteristic of DIE Lesions [9]. DIE induced pain can thus be described as organ and location specific pain. Rectovaginal endometriosis accounts for 5% to 10% of women with DIE [9]. It is characterized by the presence of palpable endometriotic nodules deep in the connective tissue of the pelvis. This shows profound fibrosis and fibromuscular hyperplasia [9].

Surgical versus Conservative Management

Surgery is the primary mode of treatment in most of the infiltrating diseases. Surgical treatment is very effective in relieving painful defecation, pelvic pain and dyspareunia [10]. In principle, deep endometriotic lesions should be ignored some time and should not be always treated because of its passive impact (and effect). However, intestinal and ureteral foci that cause progressive stenosis constitute indisputable reasons for operating. Otherwise, it is not necessary to opt for asymptomatic DIE surgery and should not be considered mandatory in all cases. In case there is no response to medical therapies or there is a symptom, which requires urgent surgical procedure, surgery should be the primary mode of DIE treatment. In addition, the location of the DIE lesions must dictate the choice of operating technique. Since endometriosis is located primarily on the pelvic organs, laparoscopy should be the preferred technique for diagnosis, especially in multifocal cases. It is ideal to obtain consent for surgical resection of DIE, if surgery is performed for diagnosis.

Normally, the mean number of lesions is significantly correlated with the location of the main lesion, as the percentage of isolated DIE lesions that is located on a single, varies between 29 and 83% [10]. During speculum observation, a bluish lesion is observed which is normally located in the upper third corner of posterior vaginal wall. These are normally pathognomonic for DIE diagnosis. Under such situation, a detailed medical investigation in the posterior vaginal fornix should be made for irregular appearance or for a stiff and thickened area. During this process, existence of a nodule must be sought during the vaginal touch. Even though, most clinicians sought for nodular lesion (a most standard form observed), it is not a must-to-follow rule [11,12]. It is also true that the outcome of clinical examination varies per the physical location of the lesion. However, signs like lateral deviation of the cervix [13] or asymmetry of the uterosacral ligaments instead of a nodule are also evident [14,15]. With a close examination with the speculum that finds lesions evocative of endometriosis, the upper third of the posterior surface of the vagina is infiltrated. Nevertheless, this proportion is significantly far lower in cases where the bowel or uterosacral ligaments are involved [11]. On the same note, lesions affecting vagina results in more frequent palpation of a nodule or painful infiltration during the vaginal touch [11]. So, the surgical practice must systematically include a rectal touch.

Preoperative Evaluation

Pelvic exam still represents an important step in the initial evaluation of DIE, as it offers the first perspective of preoperative assessment. Studies have demonstrated that results vary depending on DIE involvement, having low sensitivity and specificity, especially when referring to multiple localizations: ovaries, bladder, rectum, ureters etc. Fauconnier et al. in a study on 255 women evaluated the correlation between specific symptoms such as: dysmenorrhea, dyspareunia,

dyschezia, gastrointestinal symptoms, and noncyclical pelvic pain and the anatomic locations of deep infiltrating endometriosis. They found a direct correlation between symptoms and location of DIE, as painful defecation was associated with vagina involvement and dyspareunia with uterosacral ligament localization. Other manifestations such as: GI symptomatology and lower urinary tract symptoms were correlated with bowel, respectively with bladder extension. It was also noticed that severe dysmenorrhea was more frequent in patients with adhesions in the Douglas pouch [16]. In a study by Chapron et al., 300 women were evaluated in order to assess the type and severity of pain symptoms and correlate them with intraoperative findings. Endometrioma associated to severe pelvic pain strongly correlates with the presence of DIE, thus making preoperative extensive evaluation of endometriotic lesions mandatory for planning the surgical intraoperative strategy [17]. As a consequence, it is crucial to conduct additional investigations in order to map out DIE lesions accurately before surgery. The best time to conduct additional investigation is either during menstruation or just before/after the menstruation. Pelvic exam should always be associated with transvaginal ultrasound (TVUS), which is definitely the most important and widely available tool in evaluating endometriosis. Existing preliminary results need to be confirmed, but is a common view that TVUS should be conducted systematically at first intention [18]. Transrectal ultrasonography (TRUS) is one of the most reliable and widely accepted methods of diagnosing for infiltration of the bowel wall [15,19-22]. Infiltration of the bowel wall is an essential point of preoperative investigation as it affects the way the surgery is performed. One must consider following factors while opting for TRUS: (1) pre-existence of rectal bleeding (2) possible bowel infiltration (3) possibilities of painful menstrual bowel functional symptoms in the absence of rectal bleeding and (4) possibility of a large posterior lesion. Among other methods, few clinicians also adopt cystoscopy and ureteroscopy in order to determine urinary tract mucosal infiltration, especially when bladder endometriosis is suspected [23-25]. This method allows the position of the lesion relative to the ureteral meatuses to be established. This is an important factor to consider especially when deciding on the surgical technique.

Regarding preoperative staging, the revised American Society for Reproductive Medicine (rASRM) score is the most widely used classification of endometriosis. The Enzian classification, also revised in 2011 and mainly used in the German-speaking countries, was developed as a supplement to the rASRM score, in order to provide a morphologically descriptive classification of deeply infiltrating endometriosis [26].

Magnetic resonance imaging (MRI) is another means of preoperative evaluation that provides complete and simultaneous descriptions of the anterior and posterior compartments of the pelvis [27]. Complete and simultaneous preoperative evaluation is important, as DIE lesions are most often located in the posterior compartment of the pelvis [10,28]. Posterior compartment of the pelvis is an area that transvaginal ultrasonography does not explore well. One drawback of MRI is that it is less sensitive for the diagnosis of bowel infiltration [29,30].

Virtual modified colonoscopy is a single investigation that can visualize all affected organ systems in the pelvis and abdomen (multifocal bowel lesions, urinary tract lesions, reproductive organ lesions, and distant organ lesions such as liver involvement). The LSD/MURO Scale is a new preoperative classification designed specifically for this method in an attempt to quantify the severity of rectogenital disease and disseminated endometriosis [31]. Further studies are essential to establish novel way of diagnosing bowel infiltration and to define the respective places of the various additional means of investigation. If the intestinal infiltration is known or suspected to exist, the bowel must be prepared preoperatively.

In conclusion, TVUS / TRUS provide accurate information about the presence and extent of the lesions. Moreover, TVUS with or without prior preparation of the colon, can be alone an accurate non-invasive method for preoperative detection of deep-infiltrating endometriosis (DIE) involving the rectosigmoid. Ultrasound evaluation of DIE lesions is very similar to that performed laparoscopically in concordance with Enzian classification. However, involvement of the USL, pelvic and vaginal wall is difficult to assess by ultrasound only. MRI proves its worth in the correct classification of doubtful cases, in case of extrapelvic localization and abdominal adhesions. Both ultrasound and MRI are accurate diagnostic methods, with no differences in terms of disease staging. Transvaginal ultrasound is the first choice investigation if clinical suspicion is present and for rectovaginal septum evaluation. Enzian classification and rASRM score supplement each other in terms of morphological description and have common potential for classifying endometriosis. Preoperative staging permits the creation of a treatment plan and provides an early stage prognosis [26,32-35].

Choosing the Best Surgical Approach

The overall goal behind designing the best surgical approach is to achieve complete resection of all symptomatic DIE lesions during a one-step surgical intervention. To accomplish this, several surgical procedures must be associated. Operative laparoscopy based partial cystectomy is a standard method for bladder DIE. For vaginal DIE, numerous authors have demonstrated that operative laparoscopy using various techniques like electrosurgery, sharp dissection or laser CO₂, exclusively laparoscopic procedure or laparoscopically assisted vaginal surgery is highly efficient. For DIE infiltrating the uterosacral ligaments, it has been shown that laparoscopic surgical resection is efficient.

In principle, the location of the endometriosis governs the choice of operating technique. Despite a huge number of available publications, there is no definitive answer available for a best possible surgical procedure that is recommended for women presenting with DIE. Previous studies show at least two widely used (and accepted) surgical approaches that are employed: (1) colorectal resection removing the rectal segment affected by the disease, and (2) nodule excision. Nodule excision may be performed by shaving the rectum. Alternatively, nodule excision is performed by removing the nodule along with the surrounding rectal wall. Again, the best surgical procedures to treat DIE lesions can be further divided into two concepts of surgery: conservative and radical. Conservative surgery is otherwise known as "nodulectomy" where intestinal DIE implant is resected. Nodulectomy is accomplished by rectal shaving [36-39] or mucosal skinning [40]. Rectal shaving allows an incomplete excision of microscopic implants, and lead to cyclic pain or digestive complaints. However, as cyclic pain may be controlled by post-operative hormonal treatment, they should not lend support to an argument for a more aggressive surgical approach. In case of bladder endometriosis, partial cystectomy is the surgical treatment of reference. This operation has been conducted by operative laparoscopy as described elsewhere [41,42]. Moreover, clinicians use laparoscopic surgical resection in cases of deep endometriosis infiltrating the uterosacral ligaments [43-47]. In this case, it is necessary to conduct ureterolysis to be able to execute the uterosacral ligament (USL) nodule completely without any risk of ureter injury. Decision on laparoscopic surgery is totally dependent upon the nature of USL. A bilateral surgery is conducted if a nodule affects both USLs. However, a healthy contralateral ligament should not be resected if the USL lesion is unilateral.

Approaching an advanced stage of endometriosis disease can be a real challenge, as it should take into consideration the real extent of infiltration and all possible complications that may appear. Angioni et al. demonstrated that incomplete surgery of DIE can eventually lead to higher rates of pain recurrences and even to repeated surgery accompanied by medical therapies [48].

Determining Quality of Life Improvement after Surgery for DIE

Quality of life (QOL) and health-related satisfaction of DIE patients can be assessed with the Medical Outcomes Survey Short Form 36 (MOS-SF-36). Available in several languages, MOS-SF-36 is the most widely used generic instrument to evaluate health-related quality of life and offers a simple tool to help clinicians select and inform patients who might benefit from DIE surgery [49]. Previous study shows that preoperative assessment of QOL with the SF-36 questionnaire can predict the QOL improvement after laparoscopic resection for endometriosis [50]. It is very important to emphasize patient's pain during the preoperative examination, which normally has a higher impact on the other components of QOL [51]. However, conservative surgeries in young women have a higher rate of pain recurrence [52]. Same study has demonstrated that in the absence of bowel resection in women with DIE, intestinal endometriosis is the factor most strongly associated with the actuarial recurrence rate [52].

One flip side of this questionnaire is that, SF-36 contains 36 items and thus places a considerable burden on both patients and investigators [53]. To overcome this issue, Ware and colleagues, therefore, decided to develop a substantially shorter questionnaire-the SF-12—reducing the number of items from 36 to 12 [54]. Clinicians found that the SF-12 summary measures are highly correlated with the SF-36 summary measures. In addition, SF-12 items explained about maximum variation of the SF-36 summary measures. SF-12 also reproduces eight-scale profile with fewer levels than SF-36 scales and yields less precise scores, as would be expected for single-item and two-item scales [50]. However, for large group of studies, confidence intervals are largely determined by sample size and hence these differences are not as important.

Previous studies have evaluated the impact of surgery on quality of life using visual analogue scale (VAS) [55,56]. From a group of patients with endometriosis, a significant negative correlation between VAS rating and quality of life has been evaluated by using MOS SF-36 questionnaire [57]. In addition, the same group has found a relation between hyperalgesia to pressure pain threshold measured and the impairment of SF-36 physical function as well as mental health parameters. All these interesting facts emphasize the systematic use of MOS SF-36 questionnaire as a tool, especially to identify patients who may have a benefit of surgery. On the same note, Abbott et al. (2004) have demonstrated a placebo effect of surgery on quality of life in 30% of patients with DIE [58]. Using qualitative and semi-quantitative evaluations of symptoms, Redwine and Wright (2001) has convincingly demonstrated that women with predominant low back pain or asthenias are less likely candidates for extensive surgery [59]. However, we observed these data are partly in contrast with a previous report [60] with no reduction in medium- or long-term frequency and severity of recurrent dysmenorrhea after laparoscopic uterosacral ligament resection.

A study published by Mabrouk et al (2011) on 100 patients who underwent laparoscopic surgery for DIE evaluated quality of life through the QOL questionnaire, the short form 36 (SF-36), which was completed preoperatively and postoperatively at 6-months. Laparoscopic excision of DIE lesions performed either by intestinal segmental resection or by nodule shaving, significantly improved the general symptomatology in DIE, with an increase in patient's general status and even psycho-emotional condition. The authors encourage clinicians to use this questionnaire when assessing women's health-related quality of life outcome after surgery for DIE [61]. Dae Gy Hong et al. evaluated the outcomes on health-related quality of life (HRQOL) of radical excision of DIE in Douglas cul-de-sac among 390 patients who underwent laparoscopic surgery. They evaluated the preoperative and postoperative visual analog scale (VAS) pain scores

and HRQOL data from the 36-item Short Form (SF-36) questionnaire and concluded that radical excision of DIE is safe and is associated with significant improvement in QOL, especially in terms of pain [62]. Another study by Angioni et al. demonstrated that complete surgical excision of deep endometriosis is associated with better long-lasting improvement in quality of life. They encouraged surgeons to completely excise DIE implants when possible, as administration of GnRHa is followed by only a temporary improvement of symptomatology when incomplete surgery is performed [48]. In a study published by Ruffo et al., long-term outcome after laparoscopic bowel resections for DIE was evaluated on a number of 900 cases. Bowel resection for endometriosis is associated with an acceptable postoperative complication rate and significant improvement in symptoms (except for rectal bleeding and dysuria). Unfortunately, the median follow-up was just 54 months, which can be considered as a bias, so further studies need to be done in order to confirm the results [63].

The study published by Lukic et al. showed significant improvement in women with endometriosis and deep dyspareunia who underwent laparoscopic interventions. After a six-month follow-up, there was a significant improvement either in painful symptoms, but also in the quality of sexual and social lives [64]. Unfortunately, there are a few studies evaluating the quality of sex life in women with dyspareunia and endometriosis before and after surgical treatment. Abbott et al. evaluated the surgical outcomes in 135 women, demonstrating improvement in dyspareunia and sexual pleasure using the Sexual Active Questionnaire (SAQ), with a 2-5 year follow-up [65]. Ferrero et al. also showed an increase in the number of coitus and more satisfactory orgasm among 68 women who underwent surgical intervention for endometriosis [66].

A pilot study on 20 patients with DIE and colorectal infiltration who benefited from osteopathic manipulative therapy, showed an improvement of the quality of life evaluated by the SF-36 questionnaire. Further randomized studies are required to correctly evaluate the benefits and outcomes of this technique [67].

Identifying Patients Most Likely to Benefit from Surgery

The latest review on the subject clearly concludes that surgery should be indicated only in the following situations: patients who present with significant dyspareunia and dyschezia that results in major impairment of quality of life (evaluated by VAS), patients who present with signs of bowel obstruction, and patients who have failed previous in vitro fertilization (IVF) cycles [68].

Therefore, a thorough preoperative diagnostic investigation and careful detailed counseling are of major importance to understand which patients are most likely to benefit from DIE surgery. A good understanding of family history and physical examination of the patients helps predicting clinicians to evaluate the risks and benefits of surgery on an individual basis. Patients with prior information of the intestinal and urologic systems are the good candidates to schedule intraoperative consultation. Laparoscopic visualization remains the gold standard for diagnosis of endometriosis and preoperative imaging may also help guide therapeutic approaches, enabling patient counseling prior to surgery. Patients with pain should undergo a trial of empiric hormonal treatment, especially those who fail to benefit from laparoscopy. Patients with unsatisfactory preoperative function are most likely to improve, especially those with worse preoperative imagery. However, patients with a previous family history of DIE are less likely to gain functional improvement. Previous studies report a worse preoperative physical function as a strong predictor of functional improvement. This is true for patients who especially fall under upper quartile of the change in SF-36 function score [69]. One must consider predictive variables and operationalize into a clinical scoring tool to identify patients who are most likely to benefit from DIE surgery in terms of a clinically meaningful improvement in SF-36 function score.

Conclusion

A delay between onset of symptoms and diagnosis of DIE is mainly attributed to insensitivity of specific signs and available diagnostic tests. There is a clear need for a comprehensive preoperative evaluation of the disease with precise description of the morphologic extension. This mandatory step can provide the necessary surgical planning and predict possible future quality of life improvements. Patients should be precisely informed and counseled about treatment options and expected results.

Conflict of interest

The authors have no conflict of interest to report.

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The Impact of Body Image and Self-Perceived Physical Ability on the Well-Being after Mastectomy without Reconstruction

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Abstract

Introduction: Mastectomy has well-known effects on both physical health status of the patients as well as on their mental life (self-image, daily activities, social integration, lifestyle, etc.). The aim of this study was to identify the physical and psychological factors associated with post-mastectomy distress.

Material and Methods: Thirty-one women aged 39 to 69 years old (mean age 57 +/- 7.85 years old) who underwent surgery for tumour excision responded to questionnaires on their current physical and psychological well-being following surgery. 83.33% of the patients underwent mastectomy, 10% lumpectomy, and 6.67% both interventions. Age at the time of surgery ranged from 33 to 67 years old (mean 48.30 +/- 7.54). Fifty percent of the patients had no family cancer history, 30% had a family cancer history, and 16.67% were not aware of their family antecedents.

Results: Over half of the women were satisfied with their arm and trunk mobility and the ability to perform strenuous or prolonged exercise; 60% of patients were satisfied and very satisfied with the postoperative scar. 78.56% feel comfortable when making short trips (weekend). A higher depression score was identified in patients who received chemotherapy compared to those who received hormonotherapy, radiation therapy or targeted therapy.

Conclusions: The quality of life of mastectomized patients is influenced by the level of satisfaction with body image, perceived physical state, and independence in activities of daily living, and type of therapy. The age at the time of surgery, time passed since surgery or educational level, had no influence on the quality of life.

Keywords: Mastectomy; Quality of life; Distress; Breast cancer

Introduction

Breast cancer is the most common form of cancer diagnosed in women (23% of all cancer cases) and the leading cause of cancer death, accounting for 14% of all cancer deaths [1]. Studies show that breast surgery, regardless of type, mastectomy or lumpectomy, has a major impact on both health and psychosocial life, affecting patient's femininity, body image and indirectly her behaviour and social integration [2].

The impact of mastectomy is strongly reflected on body image during the first 3-12 postoperative months [3]. Thirty percent of the women with breast cancer require mastectomy, of which 8-10% undergo immediate or delayed breast reconstruction. Many studies have confirmed its psychosocial benefits; however, the research conclusions are not generally valid [4-7]. Boughton showed that most psychological consequences of conservative breast cancer surgery mostly depend on individual personality and not on the type or technique of surgical procedure [8]. The psychological echo of mastectomy is generated by stress and feeling of disfigurement due to breast loss, to which the anxiety generated by the disease that threatens the vital prognosis adds up [9].

The ultimate goal of modern medicine is to overcome life-threatening obstacles and offer better chances of survival to certain categories of persons who would otherwise have tragic destinies. This idea is more easily understood by people who have to deal with patients with similar diagnoses [10].

According to the WHO definition, the concept of "quality of life" (QoL) implies the absence of disease on the background of physical, social and mental well-being [11]. Ensuring QoL is assumed by a multidisciplinary team of physicians, psychologists, social workers, nurses, who must work together to improve the physical, mental

and social well-being of patients. The WHO definition of health emphasizes not only the physical well-being, but also the idea that health represents a balance between physical, mental and social well-being in an environment that promotes good health. Consequently, the health status is the expression of individual's capacity to adjust adequately to his environment, so that a harmonious balance between the psychophysiological states, body resources and environmental circumstances to be established. Currently, there is no universally accepted definition of health, but a plurality of definitions, due to the extensive *medical knowledge gained*, cultural specificity and to the fact that health is an evolving concept. As advances in medicine have led to highly improved therapeutic methods aimed at delaying as much as possible the complications and death, logically, those who are assessing the health status should consider the idea of not only saving lives but also of improving its quality.

Osoba evokes six basic lessons emerging from the measurement of QoL in oncology: (a) QoL is a multidimensional construct that should be measured with adequate tools; (b) outside observers are poor judges of how cancer patients feel about their QoL; (c) high rates of compliance

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in the collection of self-report QoL data; (d) aggressive therapy may result in improved QoL; (e) pathological symptoms are associated with quantifiable disruptions in QoL; (F) CV pre-treatment QoL may be predictive of may be predictive of on-treatment QoL and of survival [12]. The breasts are attractive in many cultures and losing a breast by mastectomy is considered to be extremely demanding mentally compared to other forms of cancer therapy [13]. In this context, surgeons hope that breast preservation or reconstruction would help the affected women to regain psychological well-being, resume daily life activities, and have sexual relationships and better sexual functions after breast cancer diagnosis and treatment [14].

Material and Method

Study sample

In the interval October 2014 - January 2015, a total of 31 women from Northeast Romania who were diagnosed with breast cancer and underwent mastectomy answered a QoL-M questionnaire developed by the first author of this study. The relatively small study sample is mainly explained by the surprisingly numerous difficulties encountered in identifying and approaching the patients operated for breast cancer. Most patients (93.1%) were from urban areas, and 6.9% from rural areas and their age ranged from 39 to 69 years old, with a mean of 57.22 +/- 7, 85 years old. The time elapsed since surgery ranged from 1 to 21 years, with a mean of 8.25 +/- 4, 89 years. The age at the time of breast cancer surgery ranged from 33 to 67 years old, with a mean of 48.3 +/- 7, 54 years.

Fifty per cent of the patients had higher education, 30% high school education, 6.67% secondary education and 13.32% primary education or unschooled. As to marital status, 6.45% were unmarried, 54.84% married, 25.81% divorced, and 12.9% widows. A percentage of 12.9 had no children, 41.94% had one child, 38.71% had two children, and 6.45% had three children.

QoL-M questionnaire

The questionnaire consisted of 64 items with response scales (four levels of intensity), developed by studying the literature and based on the results obtained from personal interviews and focus groups of mastectomized patients. Items are based on a 5-dimensional structure: functional (e.g. satisfaction with arm mobility), physical state (e.g. frequency of arm pain); relational (e.g. family relationship); mental disposition (e.g. good mood); sexual life (e.g. frequency of intercourse).

The following socio-demographic variables were taken into account: age, area of residence, education level, marital status, number of children, depression level, data on surgical intervention, aspects of the doctor-patient relationship, family history, comorbidities, disease-related data (diagnosis, time passed since surgery), treatment, type of surgery, ways of informing the patient about the possibility of breast reconstruction, source of information and reasons for not having breast reconstructive surgery until the time of questioning. The relationships between these variables and responses to the QoL-M questionnaire will be analysed in a further step of this

The main objectives of this research were:

1. preliminary assessment of QoL-M questionnaire psychometric characteristics;
2. Analysing the collected data about the QoL of mastectomized patients and the relationship between QoL and the level of depression.

The research was approved by the Ethics Committee of the Iași "Grigore T. Popa" University of Medicine and Pharmacy. The questionnaire was completed after the patients were instructed and signed the informed consent. Data were processed with SPSS 22.0.

Results

Medical variables

The synthesis of medical data of patients included in the study is shown in Table I. About half of the investigated patients (46.67%) had various associated diseases (other cancers, hypertension, diabetes), 46.67% answered that they did not have associated diseases, while 6.67% said they were not aware of diseases other than the one they were operated for.

Fifty per cent of patients declared not having a family cancer history, 30% had a family cancer history (parents, siblings or extended family), and 16.67% said they were not aware of such a diagnosis in their close relatives. More than half of the patients, 53.33%, declared that prior to diagnosis they had various family problems (financial, relational, stressful life events etc.)(Table I).

Psychometric characteristics of QoL-M questionnaire

Data in Table II summarize the correlations between the 6 dimensions of the questionnaire, overall QoL score and Cronbach alpha value, calculated on the study sample. The values show in the first place, appropriate levels Cronbach alpha index, from 0.79 to 0.94. As expected, the correlations between overall score of QoL and the six dimensions are relatively high. However, the correlations between questionnaire dimensions are relatively small, indicating a sufficient level of mutual independence. (Table II)

Analysis of Satisfaction Level with some QoL Indicators Measured by qol-M Questionnaire

Satisfaction with physical state

The items aimed at identifying the level of satisfaction with the ability to perform strenuous or prolonged exercise, arm and trunk mobility, variables considered only in relation with the performed surgery and its consequences. Responses were assessed on a scale of 1 to 4 (where 1=very little satisfied, 2=little satisfied 3=satisfied and 4=very satisfied) and the results are as follows:

1. Capacity to perform strenuous physical exercise, with mean of 2.28+/-1.15; of all responses, 25% of patients were very little satisfied, 7.14% little satisfied, 53.57 satisfied, and 7.14% very satisfied with their ability to perform strenuous exercise;

Table I: Medical data related to the type of surgery for malignant breast tumour removal.

Type of Surgery	Percentage (number)
Mastectomy	83.33% (N=22)
Sectorectomy	10% (N=3)
Breast surgery of both breasts by both procedures	6.67% (N=2)
Therapy type	Percentage (number)
Chemotherapy	86.7% (N=26)
Radiation therapy	60% (N=18)
Hormone therapy	70% (N=21)
Targeted therapy	10% (N=3)

Table II: Correlations between QoL overall score and QoL dimensions (On diagonal the index Cronbach alpha).

Scales	No. of items	1	2	3	4	5	6
QoL overall score	49	-0.94					
Functional	14	0.73**	-0.87				
Physical	9	0.66**	0.2	-0.91			
Relationships	6	0.78**	0.70**	0.22	-0.79		
Mental disposition	15	0.89**	0.61**	0.61**	0.65**	-0.86	
Sexual life	5	0.76**	0.35*	0.48**	0.54**	0.62**	-0.85

*Significant at $p < 0.001$

*Significant at $p < 0.05$

2. Prolonged physical exercise, with a mean of 2.32 +/- 1.14: 8% of the patient were not at all satisfied, 20% were satisfied, 12% little satisfied, 52% satisfied and 8% very satisfied with their capacity for prolonged physical exercise;
3. Arm mobility, with a mean of 3.28 +/- 0.93; of all responses, 7.14% were very little satisfied, 10.71% little satisfied, 28.57% satisfied, and 53.57% very satisfied;
4. Arm swelling after breast surgery, with a mean 2.75 +/- 1.17, of which 25% were very little satisfied, 7.14% little satisfied, 35.71% satisfied and 32.14% very satisfied with lymphedema;
5. Trunk mobility, with an average of 3.4 +/- 0.97, of which 7.41% were very little satisfied, 11.11% little satisfied, 14.81% satisfied and 66.67% very satisfied with the ability to move their body;
6. Postoperative scar, with an mean of 2.73 +/- 1.11; of all responses, 19.23% were very little satisfied, 19.23% little satisfied, 30.77% satisfied and 30.77% very satisfied with postoperative scar appearance.

The statistical significance of the above presented percentages was subjected to chi-square test goodness of fit, to analyse the deviation of the answer values profile from the null hypothesis (equal frequency of each answer level). A non-significant *p*-value for an item means that the answers profile for that item significantly departs from equal frequency profile, and therefore that item capture a significant preference for the observed levels responses. The associated phi-Cramer index is the effect size measure of each chi-square test. The greater effect size index, the greater the intensity of preference for the chosen answer values for that question. The results are summarized in (Table III).

As can be seen, in all cases the profile of responses deviates statistically significant the null hypothesis (equal percentages for the four possible answers). Even more important than statistical significance is the phi-Cramer index of effect size, which was high and very high (over 0.40) in most situations. The lowest value of this index was for postoperative scar (0.29), which is characterized by an effect size only slightly exceeding the average. These data support the conclusion that these questionnaire indicators are relevant in for the level of QoL in mastectomized patients.

Satisfaction with self-perceived physical appearance

The questionnaire included items related to the comfort to wear clothes, bra included, and satisfaction with the perceived body image. Over half of the questioned patients said they were satisfied and very satisfied with the way clothes fit them (40.74% and 18.52%, respectively), while 25.93% were little satisfied and 14.81% very little satisfied

As to satisfaction with the self-perceived body image over 35% were very little or little satisfied, 25% were satisfied and 39.29% very satisfied physical. Over 40% of the patients who responded to the questionnaire said that wearing a bra is uncomfortable, and were very little satisfied (14.81%) and little satisfied (25.93%) with the need of wearing it, while 59.26% felt very comfortable wearing a bra.

Satisfaction with daily or leisure activities

The items aimed at identifying the level of satisfaction with the ability to cope with household, work-related and leisure activities, or ability to make shorter (weekend) or longer (vacations) trips. These variables were taken into account only related to performed surgery and its consequences. The answers were assessed on a scale of 1 to 4 (where 1=very little satisfied, 2=little satisfied 3=satisfied and 4=very satisfied) and the obtained results were distributed as follows:

1. Ability to cope with household activities, with a mean of 2.92 +/- 1.05: 7.14% of the patients were very little satisfied, 14.29% little satisfied, 42.86% satisfied and 32.14% very satisfied;

2. Ability to cope with work-related activities, with a mean of 2.53 +/- 1.37. Of the investigated patients 14.29% were not in employment, either because they were retired or unemployed. Of all employed patients, 10.71% were very little satisfied, 7.4% little satisfied, 42.86% satisfied and 25% very satisfied their ability to cope work duties.
3. Ability to perform leisure activities, with a mean of 2.7 +/- 1.97. A percentage of 7.14% of patients were very little satisfied, 10.71% are little satisfied, 42.86% satisfied and 28.57% very satisfied with their ability to cope with leisure activities. A percentage of 10.71% recognized they did no longer engage in activities they enjoyed.
4. Ability to make longer trips, such as holiday travels (with an average of 2.66 +/- 1.20) or shorter weekend trips (with an average of 2.96 +/- 1.34). Of the questioned patients 3.70% declared that they did no longer travel on vacation and 10.71% on weekends. The frequency of responses is shown in Table IV.

The significance of the percentages obtained to questions about daily and leisure activities was also subjected to chi-square test goodness of fit test (Table V).

As with physical state, the profile of answers to these questions had a statistically significance ($p < 0.05$). Also the values of effect size index exceed the "large" effect threshold, showing that patients feel a strong positive effect of mastectomy in terms of physical state. However, although high, effect size levels for physical and leisure activities were significantly lower than those obtained for physical state (Table II). Also, it is interesting to note that satisfaction with the ability to perform short trips is noticeably higher (0.91) than the satisfaction with the ability to make long journeys (0.39).

Relationship Between Quality of Life and Depression

The level of depression was measured with BDI (Beck Depression Inventory), composed of 21 items related to symptoms of depression,

Table III: Results of chi-square goodness of fit test and effect size for answers on the physical state.

Items	Chi-square Goodness of fit	<i>p</i>	phi-Cramer Index'
Capacity for strenuous physical exercise	58.16	<0.001	0.97
Capacity for prolonged physical exercise	48	<0.001	0.88
Arm mobility	54.08	<0.001	0.93
Arm swelling after breast surgery	19.38	<0.001	0.56
Trunk mobility	93.7	<0.001	1.23
Postoperative scar	5.32	<0.05	0.29

*Thresholds for interpretation of phi-Cramer index:

0.10 = Little effect; 0.25 = Medium effect; 0.40 = Large effect

Table IV: Answers for the ability to travel.

Answers	Longer trips	Shorter trips
Very little satisfied	18.52%	7.14%
Little satisfied	14.81%	3.57%
Satisfied	33.33%	32.14%
Very satisfied	29.63%	46.43%

Table V: Results of chi-square goodness of fit test and effect size for answers related to daily and leisure activities.

Items	Chi-square Goodness of fit	<i>p</i>	phi-Cramer Index'
Ability to cope with household activities	32.14	<0.001	0.72
Ability to cope job activities	33.68	<0.001	0.74
Ability to perform leisure activities	34.19	<0.001	0.74
Ability to make trips	9.466	<0.05	0.39
Ability to make short trips	51.38	<0.001	0.91

*Thresholds for interpretation of phi-Cramer index:

0.10 = little effect; 0.25 = medium effect; 0.40 = large effect

such as hopelessness and irritability, perceptions of guilt or of being punished, or physical symptoms, such as fatigue, weight loss or loss of sexual desire. The study identified an average score of depression of 6.7 ± 6.29 .

The relationship between QoL and depression was studied on dimensions level and overall QoL scoring and on elementary-level indicators of the questionnaire. For the first level, the results are summarized in Table VI, which presents the Pearson r correlations between overall QoL score, its dimensions and BDI questionnaire score. The obtained results show that a low level of overall QoL score and its mental and somatic dimensions is associated with statistically significant higher levels of depression (Table VI).

For a better understanding of the relationship between QoL and depression the responses to QoL indicators were correlated with depression level. Table VII synthesizes the correlation between the level of depression (measured with BDI questionnaire) and satisfaction with physical state and functional capacity (measured with QoL-M questionnaire).

Given the small size of our study sample, it was not surprising that most correlations did not reach statistical significance. As a result, it was more relevant to interpret the correlation coefficients in terms of effect size. According to Cohen's recommendations [15], we refer to the following thresholds: $r=0.01$ – small, $r=0.24$ – medium, and $r=0.37$ – large.

The correlations in Table VII allow us the following conclusions:

Higher levels of satisfaction with postoperative scar are associated with lower levels of depression;

Feeling comfortable with wearing a bra is associated with lower levels of depression;

Ability to make longer trips correlates with lower levels of depression;

The other variables in the table have no relevant correlations with depression (Table VII)

Analysing the obtained correlations in Table VIII between depression and self-image in public places, we can draw the following conclusions:

Depression levels tend to be higher when the satisfaction with family relationships (spouse, children, and parents) is lower. Although negative, the correlations of depression with satisfaction with extra-family relationships (friends, colleagues, etc.) remain at a low threshold;

A higher level of depression is associated with a lower level of satisfaction with the way the clothes fit and her physical appearance with or without clothes;

Regarding sexual life, a higher level of depression is associated with a lower frequency of sexual intercourse and with a poor perception of femininity. No relevant correlations resulted in terms of libido, satisfaction and state of comfort and relaxation during intercourse;

A higher level of depression is associated with lower self-confidence in public places, less optimism and good mood, while self-confidence in the family environment showed no relevant correlation (Table VIII).

Discussions

Breast reconstruction is an important step in breast cancer management. Data in the literature demonstrate that the psychological effects of that procedure depend on a series of variables such as age, psychological traits, patient-surgeon relationship, and relationship with the partner, socioeconomic level, and type of breast reconstruction. The QoL of mastectomized patients can be considerably improved

by selecting the most adequate strategy, both medically and psychologically.

Considering the safety proven by conservatory breast surgery procedures, with excellent cosmetic results, it is obvious that they lead to an improved body image, well-being and QoL of the patients and their entourage [16]. However, we are not entitled to neglect the depression symptoms that occur frequently in patients with mastectomy. The answer to this health problem can be provided by reconstructive surgery. Studies analysing the well-being in more and more specific pathologies prove that women who undertake plastic surgery after mastectomy have lower depression levels, as compared with patients who do not choose these procedures [17].

Besides the evolution of oncogenetics and the modern multidisciplinary medical collaborations, we presume that the prophylactic bilateral mastectomy rate will also increase in the years to follow. New genetic discoveries related to breast cancer motivate the risk patients and their close relatives to take regular tests and to have surgery if necessary [18]. It is a known fact that contralateral

Table VI: Pearson r correlations between QoL measured with QoL-M and BDI, calculated with the bootstrap technique (1000 resample).

Quality of life (QoL-M)	Depression (BDI)
Overall score	-0.35*
Somatic	-0.51*
Functional	0.03
Relationships	-0.19
Mental	-0.34*
Sexual	0

* $p<0.05$

Table VII: Correlations between depression and satisfaction with physical state and functional capacity (bold letters indicate the correlations that reached at least medium level).

Items	r	p
Postoperative scar	-0.5	0.001
How comfortable is it to wear a bra	-0.34	0.085
Ability to make longer trips (e.g. vacation / holiday)	-0.24	0.238
Capacity to perform strenuous exercise.	0.23	0.239
Capacity to perform prolonged exercise	0.15	0.486
Ability to cope with household activities	-0.08	0.671
Ability to perform job duties	-0.2	0.314
Ability to perform recreational activities	0.04	0.843
Ability to make shorter trips (e.g. on weekends)	-0.1	0.599
Trunk mobility (can you lean?)	-0.04	0.838
Arm mobility	0.1	0.607
Arm swelling after breast surgery (lymphedema)	0.04	0.814

Table VIII: Correlations between depression and satisfaction with self-image, relationship satisfaction and sexual life (bold letters indicate the correlations that reached at least medium level).

Items	r	p
Relationship with the husband (partner)	-0.37	0.062
Relationship with children	-0.31	0.128
Relationship with parents	-0.4	0.04
Relationship with friends	0.01	0.963
Relationship with co-workers	-0.16	0.424
Occasional relationship with various persons	-0.11	0.588
How you look in the mirror	-0.17	0.397
How do clothes fit	-0.27	0.169
Physical appearance	-0.4	0.036
Frequency of sexual relationships (intercourses)	-0.34	0.089
Sexual desire (libido)	-0.03	0.879
Sexual satisfaction	-0.08	0.688

prophylactic mastectomy is the most effective method of avoiding relapse in the case of hereditary breast cancer patients [19].

The moment of the reconstruction may vary from one particular case to the other. It was proven that the immediate breast reconstruction does not increase the risk of tumour recurrence [16,20]. The patients who were interviewed and asked to explain their reasons for choosing breast reconstruction explained that the procedure allows them to keep the discretion about their disease, to avoid a great shock after mastectomy and to go on with the life they used to live before [21]. For women with mastectomy, a visit to the plastic surgeon is the first step towards breast reconstruction. Health insurance covers these expenses, the patients being fully supported by the law. The therapeutic trajectory is changed due to the more and more advanced cancer treatments. The breast reconstruction can be a strong ally in the fight for survival [18].

There are multiple tools used for measuring the various dimensions of the quality of life. In the studies we analysed (Ireland, China, Australia, Brazil, Poland, France, Great Britain, Italy, Belgium, Sweden, Spain, USA or Canada) most authors admit the fact that a sensitive instrument is the one that measures the research indicator accurately and that its validation is a mandatory condition for the data to be relevant and valuable. The general questionnaires we came across in most researches were EORTC QLQ-C30 [16,17,22], MOS SF-36 [19], FACT-G [23], WHOQOL [24]. It is current practice, though, for researchers to use several questionnaires on the same group of patients, so that the study acquires a specific feature for different researched dimensions. Consequently, for the measurement of depression we apply the BDI [17] or HAD questionnaires [19,25], to which the investigated anxiety component is added, Body Image Scale (BIS) [25], for sexuality, Sexuality Activity Questionnaire (SAQ), for the impact of an event upon the created feelings, Impact of Event Scale (IES) and so on.

Although general tools are still widely used [20,26], specific tools are beginning to gain more and more interest, being conceived for different cultures or groups and targeted at patients. Such questionnaires, conceived for the breast cancer pathology in Europe and the USA are: EORTC-QLQ-B23, BREAST-Q or FACT-B [16,17,22,27]. They include items for dimensions such as: functional state, physical symptoms, emotional states, psychosocial impact, self-perception, sexual life or for the calculation of the global score. The application methods vary from direct application to correspondence by mail or by direct interviews with the patients.

In order to compare pre- or post-surgery results and assess the quality of life we need two or more patient groups. This aspect varied for each particular study. Some researchers compared the results from one group of patients with mastectomy to which they presented the questionnaire in parallel with other patients with similar descriptive data who had breast reconstruction surgery in the same period [16,17,19,21-25,27]. Other researchers prefer to apply the tool retroactively for the same investigated group for the periods before and after the reconstruction surgery, the data described being provided by the patients from memory. Finally, a third category of researchers evaluated the questionnaire for the same prospective cohort before the intervention and use the same instrument at different times after the surgery. All these methods have their supporters. However, it is obvious that, despite the fact that studies are not very frequently conducted and the patient groups are relatively small, similar outcomes seem to result from all these studies.

The results and conclusions of the studies presented in literature are often similar. Statistic data are spectacular most of the time, if we compare them with the attitude of the patients who we consult or treat regularly. Women who opt for conservative surgery for cancer, for instance, have the same or slightly lower quality of life scores as

patients who had reconstruction [16]. However, both methods help in keeping the body image, with high scores on this segment, as compared to patients with mastectomy [23]. This conclusion allows us to refine upon the fact that female patients are confronted with a major negative emotional impact only when they have at least one amputated breast. This aspect can also be explained by the fact that conservative breast surgery is available especially to patients who discovered the disease in an incipient stage with early breast cancer, with higher chances for a long survival and who do not need an aggressive treatment subsequently. The satisfaction final score is higher in patients with breast reconstruction [23]. The fact that they receive or do not receive radiotherapy does not affect the similar groups (as far as the stage of the disease is concerned) [16]. Thus the patients benefit from a less traumatising rehabilitation during the subsequent treatment for breast cancer, with visible physical and psychosocial benefits.

Out of all patients who undergo breast reconstruction surgery the most satisfied are the ones opting for delayed breast reconstruction. The explanation provided by several authors is that they had more time to reflect upon their situation and to adapt to new conditions. The new breast was thus accepted much better. Moreover, the patients who lived for a while without a breast regained their self-esteem after the reconstruction surgery, which determined them to value the new breast even more. This feeling is not shared by women who have two identical breasts before the anaesthetics and have two new breasts when they wake up [24]. Brazilian women, for example, who undergo breast reconstruction surgery, have a high level of satisfaction in the psychic and social relationships fields. Breast reconstruction help patients with mastectomy to improve their quality of life, from a physical, psychic, social, self-perception and integrity viewpoint, their cognitive dimension remaining unaffected [22,24,28].

Patients are fully satisfied with the reconstruction surgery but their satisfaction does not depend on the variables related to their personal life. The longer the period left until the reconstruction is performed, the more their satisfaction decreases. As well as this, it was demonstrated that most of the patients feel that they are involved in choosing their reconstruction method [27]. The basic component that is modified after reconstruction in patients with mastectomy is the psychical one. In one of the studies in which depression was also measured it was shown that patients with a higher level of depression also had a lower quality of life level measured with both general questionnaires and questionnaires specific for breast cancer pathology [17]. Another extremely important component for our target group of patients is the sexual one. Patients usually avoid this subject [21]. Most probably the participants do not feel comfortable talking about this subject, which would be approached more easily on focus group meetings, where several people could open a debate on this subject.

More and more patients opt for immediate breast reconstruction, although the applicability of these procedures is still limited. The reasons can include the fear that planning this intervention might affect the subsequent oncological treatments, the lack of information and knowledge regarding reconstruction surgery and the patients' having other priorities besides reconstruction surgery. More research is needed in the field in order to enable clinicians to recommend and to make the right choices in their multidisciplinary therapeutic behaviour [20].

Patients should be informed about the possible side effects of the reconstruction surgery procedures. Providing fully detailed information is essential in order to create realistic expectations in the patients and enable them to have a good relationship with their surgeon. When women become aware that the techniques and materials available at the present time are less and less invasive, the number of patients who will opt for breast reconstruction surgery is likely to increase [22].

Women should be informed regarding the post-surgery psychological risk before they undergo surgery. This information must be considered by the multidisciplinary commissions during the counselling process of such a candidate [19]. Reconstruction surgery combined with psycho-spiritual therapy sessions has already begun to display promising results [28].

Conclusions

In our pilot study we have noticed higher levels of satisfaction regarding the post-surgery scar, which are associated with lower levels of depression; a feeling of comfort in wearing a bra is associated with lower depression levels; the ability to take longer trips is also associated with a lower level of depression, while the other variables did not have relevant correlations with depression.

Analysing the correlations between depression and self-perception in the public space, the following conclusion can be drawn: the level of depression tends to be higher when satisfaction within the family relationship (husband, children, parents, etc.) is lower. Depression is negatively correlated with the level of satisfaction within extra-family relationships (friends, co-workers, etc.): a higher level of depression is associated with a lower level of satisfaction regarding the way clothes fit and the physical appearance of the patient with or without clothes; as far as the sex life is concerned, a higher level of depression is associated with a less frequent sexual activity and a distorted perception of femininity.

There were no relevant correlations regarding the libido, satisfaction, the state of comfort and relaxation during the sexual activity; a higher level of depression is associated with a lower self-esteem, especially in the public space, with lower levels of optimism and happiness, while self-esteem within the family space does not present a relevant correlation.

The data obtained by the pilot study support the transition of QoL-M in the psychometric validation stage in order to draft the final version of the questionnaire. As well as this we have to mention the introduction of the zero response option (0=this question does not regard me) in the final version of the questionnaire, in order to avoid, as much as possible the refuse of the patients to answer certain questions to which they were actually unable to answer (for instance "relationship with your husband" when women filling in the questionnaire were either unmarried, divorced or widows).

This research shows that physical comfort-related aspects greatly influence the quality of life and the level of depression. The type of therapy after breast cancer diagnosis is associated with psychological parameters, meaning that chemotherapy is more frequently associated with depression than other forms of therapy (hormone therapy, radiation therapy or targeted therapy). No causal relationship have been identified between the time elapsed since surgery and age at the time of surgery, meaning that these two variables have no influence on the quality of life.

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Conflict of interests

The authors have no conflicts of interest to report.

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Atypical Presentation of Ileo-Sigmoid Knot: A Rare Case

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Abstract

Ileosigmoid knot, also known as compound volvulus, is an unusual and a rare cause of intestinal obstruction. We are reporting a case of ileosigmoid knot in a 25-year-old male, who presented with features of acute intestinal obstruction, peritonitis and hypovolemic shock. On immediate exploration after resuscitation, we found minimal haemorrhagic intraperitoneal fluid and gangrenous total colon, gangrenous distal ileal loop twisted around the base of the gangrenous sigmoid loop. Total colectomy with distal ilectomy (50 cms), Hartmann's procedure with end ileostomy was done. After 3 months we performed ileorectal anastomosis.

Keywords: Ileosigmoid knot; Gangrenous total colon and distal ileum; Hartmann's procedure with end ileostomy

Introduction

Ileosigmoid knot (ISK), also known as compound volvulus, is an unusual and rare cause of intestinal obstruction. In this condition, a loop of ileum encircles the loop of sigmoid colon & then knots on itself. It generally occurs in areas with a high incidence of sigmoid volvulus [1]. ISK is an unusual entity in the West, but is comparatively common in certain African, Asian and Middle Eastern nations, known as 'volvulus belt'. The aetiology of ISK is controversial. ISK rapidly progress to gangrene of the ileum as well as of the sigmoid colon.

Case Report

A 25-year-old male was brought to the emergency department with severe pain and distension of abdomen for 12 hours duration, which he developed in the later part of the night. Patient presented with vomitings and obstipation. On examination his pulse rate was 112/min, having low volume, BP was 90/60 mm Hg and respiratory rate was 30 cycles/min. Abdomen was distended without visible peristalsis. Abdominal examination revealed guarding and rebound tenderness without any audible bowel sounds. Patient was in hypovolemic shock, so resuscitated immediately. Investigations revealed leucocytosis (TLC-16,000), hypokalemia (Serum K⁺-2.8 meq/lit) and multiple air fluid levels along with dilated colonic loops in plain X-ray abdomen in erect position (Figure1).

With a provisional diagnosis of acute large bowel obstruction and peritonitis, we proceeded for emergency exploratory laparotomy. On exploration, minimal hemorrhagic peritoneal fluid was noted. A gangrenous loop of ileum encircling base of loop of gangrenous sigmoid colon was found (Figure 2). Unknottting of ileosigmoid knot was successfully achieved and on further exploration, a kink was found in the ileum distal to the knot. Entire colon along with distal ileum except 10 cm of ileum adjacent to ileo-caecal junction was gangrenous (Figures 3 and 4). Total colectomy with distal ilectomy (50cms) followed by Hartmann's procedure with end ileostomy in the right iliac fossa was done. Patient was allowed enteral nutrition on 3rd postoperative day and was supplemented with multivitamins (vitamin B₁₂). Post-operative period was uneventful and the patient was discharged on tenth post-operative day.

Patient was on regular follow-up and his general condition improved after 3 months when he was planned for relaparotomy and ileorectal anastomosis was done. Patient was allowed liquid diet on 5th postoperative day and was gradually advanced to solid diet on 7th

postoperative day. Entire postoperative period was uneventful and was discharged on twelfth postoperative day. Patient is on regular follow-up for last 1 year and without any features suggestive of either bile salt or vitamin B₁₂ malabsorption.

Discussion

Parker has been credited for describing the first patient of ileosigmoid knot in 1845. It more commonly affects men who are in fourth decade of life. Aetiology of ileosigmoid knot remains controversial [1]. This condition is common in east Africa, particularly among the young males of the Baganda tribe. Three factors are responsible for ileosigmoid knot; a long small bowel mesentery and a freely mobile small bowel, a long sigmoid colon on a narrow pedicle and finally, the ingestion of a high bulk diet in presence of an empty small bowel [1-3]. In our case all three factors were present. Ileosigmoid knot has been categorized into four types. In type I, ileum acts as active component and wraps around the sigmoid colon. In type II, sigmoid colon is the active component wrapping itself around ileum. In both these types it is subdivided as type A, when the direction of torsion is clockwise and type B when torsion is counter-clockwise. In type III, the ileo-caecal segment acts as the active component, while in type IV (undetermined type) [1,4]. Our case was type I, A ileosigmoid knot. The predominant symptoms and signs of presentation include abdominal pain and tenderness (100%), abdominal distension (94% to 100%), nausea and vomiting (87% to 100%), rebound tenderness (69%), and shock (0% to 60%) [1,4,5]. ISK can rapidly progress to gangrene of the ileum as well as of the sigmoid colon. Generalized peritonitis, sepsis, and dehydration are the principal complications. Radiographically, ISK is often mistaken for simple sigmoid volvulus. CT scan reveals the classical "whirl sign" of volvulus, created by the twisted mesentery and bowel, and the afferent and efferent limbs of the sigmoid colon have the appearance of a beak [2,5].

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Figure 1: X-ray showing dilated colon.

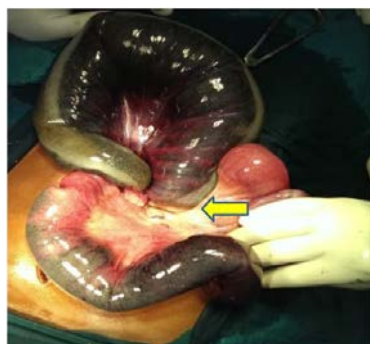


Figure 2: Showing ileosigmoid knot.

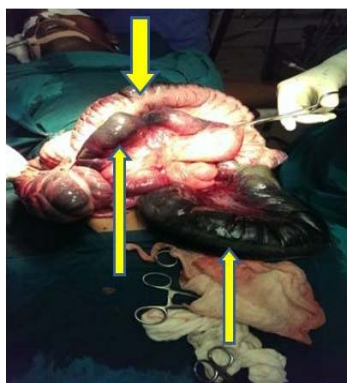


Figure 3: Showing gangrenous transverse colon, ileum and sigmoid colon.

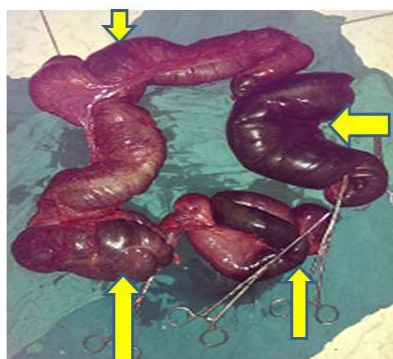


Figure 4: Resected specimen total colon and distal ileum.

The anatomical and pathological changes dictate the operative procedure. In 73.5% to 79.4% of the cases, gangrenous bowel was encountered, whereas in 20.6% to 26.5% both small and large bowels were assessed to be viable in surgery. In 52.9% to 60.3% cases, both the small intestine and sigmoid colon were gangrenous. Paradoxically, the incidence of bowel gangrene was 90.9% in those who presented within 24 hours of their symptoms. Among those who presented after 24 hours after their initial symptoms, bowel gangrene was seen in 57% [2,4,6,]. In our case we found total colon along with distal ileum except 10 cm of ileum adjacent to ileo-caecal junction were gangrenous. Closed loop obstruction caused distension of sigmoid loop, ileal loop & the bowel between these two loops. Both strangulation and thrombosis of the vessels due to increased intramural pressure because of the closed-loop obstruction contributed to ischemia and gangrene of long segment of bowel except 10 cm of non-gangrenous ileum. This type of presentation we did not find to be reported in English literature even after doing through search, so a rare presentation. Various surgical procedures have been conducted in these patients depending upon the bowel viability [5].

Conclusion

Ileosigmoid knot as such is a very rare cause of intestinal obstruction and a high degree of suspicion is needed in cases mimicking sigmoid volvulus. Timely intervention is needed as it is a closed loop obstruction and that rapidly progresses to peritonitis and gangrene. It is uncommon to see cases presenting with total gangrenous colon and distal ileum which is an atypical presentation in our case and till now not reported in literature.

Conflict of interests

Authors have no conflict of interests to declare

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Treatment of Bleeding Secondary to Gastric Metastases from Renal Cell Carcinoma Primary

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Abstract

Gastric metastases from primary renal cell carcinoma (RCC) are uncommon, but not as rare as once thought. These metastases frequently present with upper gastrointestinal (UGI) bleeding. We report two such cases, and utilising lessons learnt from them, and from a literature review, propose a model of treatment for UGI bleeding secondary to metastases from RCC primaries.

Both patients presented with clinically significant UGI bleeding secondary to RCC metastasis to the stomach. A literature search was conducted and a qualitative review of the published case reports and studies were undertaken.

The two cases were discussed in a multi-disciplinary setting to plan management. One patient underwent gastric wedge resection; the second patient received palliative radiotherapy. Cessation of bleeding was achieved in both cases. A total of 48 cases were identified from the literature search. The reports indicate that surgery for gastric metastases has favourable outcomes in patients who do not have concurrent metastases. Palliative radiotherapy in this setting has not previously been described. A model of how these patients could be managed was subsequently constructed; the key question to answer is how disseminated the disease is.

Treatment modalities are still debated and should be discussed on a case-by-case basis. However, the literature suggests that surgical intervention has good therapeutic and prognostic benefit in patients with isolated metastatic disease to the stomach. For those with widespread metastases, there are several management options available. We advise that radiotherapy should also be considered as an option in the management of patients with bleeding lesions and concurrent metastatic disease.

Keywords: Renal cell carcinoma; Metastasis; Stomach; Gastrointestinal bleeding

Introduction

Gastric metastases from primary renal cell carcinoma (RCC) are considered rare. However, there are nearly 50 cases described in the literature. We present two cases of patients presenting with clinically significant bleeding from gastric RCC metastasis; utilising lessons learnt from these cases, and from a literature review, we propose a model of treatment for gastrointestinal (GI) bleeding secondary to metastases from RCC.

Case 1

A 68-year-old Caucasian lady (Ms DA) was referred to the emergency department (ED) by her general practitioner following a collapse. She complained of fatigue, anorexia and weight loss of around 1.5 stone over 6 months. Blood tests revealed a microcytic anaemia (haemoglobin = 51 grams/litre, mean corpuscular volume (MCV) = 71 femtolitres).

Past medical history was significant for left-sided clear cell renal cell carcinoma 21 years prior to this presentation, for which she underwent a nephrectomy. Her drug history included levothyroxine, aspirin and prochlorperazine. Ms DA lived with her partner, was a non-smoker and consumed no alcohol. Physical examination at the time of presentation did not reveal anything of note.

Initial treatment involved resuscitation and transfusion of 3 units of packed red cells and an infusion of vitamin B complex. Her haemoglobin levels returned to normal parameters following this.

A computerised tomography (CT) scan showed an elevated soft tissue lesion arising from the posterior wall of the central stomach with no evidence of metastatic disease.

Ms DA subsequently underwent a gastroscopy which showed 2 ulcerated, sessile polyps, the largest measuring 20 millimetres, and a submucosal polyp on the greater curvature of the stomach. All lesions were biopsied. A colonoscopy was attempted but was limited by melaena.

A positron emission tomography CT scan and a nuclear medicine bone scan were performed, neither of which showed metastatic disease.

Histological examination of the biopsies showed clear cell RCC metastasis. Her case was discussed at a multi-disciplinary meeting (MDM), where it was decided that a laparoscopic gastric wedge resection would be most appropriate for her. This procedure was performed successfully without post-operative complications.

Histology of the resected specimen showed a well circumscribed 15 millimetre nodule in the submucosa with ulceration into the mucosa, no spread into stomach muscle and clear surgical margins.

Since this, Ms DA has annual surveillance gastroscopies which have not shown any evidence of recurrence (Figure 1).

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Case 2

A 73-year-old Asian lady (Mrs HB) presented to the ED with a one day history of per rectal bleeding, including both fresh blood and melaena. There were no associated symptoms and examination was unremarkable.

Serological investigations confirmed a microcytic anaemia, with haemoglobin = 82 grams/litre, and MCV = 77.3 femtolitres. She had already been receiving iron supplementation for this.

In 2005, she underwent left-sided nephrectomy for clear cell RCC. Surveillance CT scan that year had shown nodules in the nephrectomy bed as well as pulmonary spread. She received Sunitinib for this.

During her admission she required repeated transfusions of packed red cells for continuous per rectal bleeding and persistent anaemia.

A gastroscopy showed a distal gastric lesion in the greater curvature of the stomach with ulcerated overlying mucosa and clot. Biopsies of the lesion were taken which confirmed clear cell RCC metastasis.

Mrs HB's case was discussed in a MDM, where it was felt surgical intervention would not be appropriate given the presence of multiple metastases. Palliative radiotherapy was thought to be the best course of treatment in view of her ongoing bleeding. Thus, she underwent a repeat gastroscopy to reassess the lesion and endoscopically place marking clips for focused palliative radiotherapy. Cessation of bleeding was successfully achieved (Figure 2).

Literature Review

Renal cell carcinomas account for nearly 2% of cancers worldwide and are associated with high rates of metastases, with these often occurring several months after curative treatment [1,2]. Metastases originating from RCCs are most commonly found in the lungs, brain, breast and bones and are of clear cell histology [3-8].

Method

A review of the current literature on metastatic renal cell carcinoma to the stomach was performed using PubMed. The search terms were: "renal cell carcinoma stomach" + "renal cell carcinoma metastasis stomach". A total of 48 cases were identified (Table I).

Demographics and clinical characteristics

The majority of patients were male (67%) with a mean age of 67 years (range 45-83 years). The mean interval post-nephrectomy was 6.9 years. This implies a significant delay in the development of gastric metastases following curative treatment. Melaena was the most frequently reported presenting complaint (46%).

Tumour characteristics

Clear cell histology was evident in all cases which reported a histopathological diagnosis. Over two thirds of patients had single lesions with the appearance of polyps, ulcers or tumours. The majority of lesions were located in the body of the stomach (63%).

Concurrent metastatic disease was found in 28 patients, the majority of which was present in the lung (86%), followed by metastases to the brain (25%), and bone (21%).

Management and outcomes

Surgical intervention was used in 20 of the 48 cases identified, half of which had no other concurrent metastatic disease. Four patients underwent total gastrectomy. The remainder had partial gastrectomies including 5 subtotal gastrectomies, 4 wedge resections and 1 antrectomy. Six cases did not specify the type of surgery. Three of the cases reporting use of wedge resections were performed for treatment of lesions <7 centimetres located in the gastric body.

Of those patients who did not receive surgery, 10 had endoscopic therapy, either in the form of polypectomy, ablation or mucosal resection. Palliative embolization was the treatment of choice in 2 cases, both requiring multiple embolizations in order to achieve haemostasis. Lamb et al. (2005) report a case of a patient who required 6 embolizations following 10 upper GI bleeds. Eight patients received chemotherapy and 7 did not receive any treatment. There were no case reports in the literature which described the use of palliative radiotherapy.

Cessation of bleeding was achieved in all patients who underwent surgical or endoscopic treatment for bleeding lesions (Figure 3).

Survival

Survival rates are generally poor with metastatic RCC, with most patients dying a few months after diagnosis [1,2]. In those with metastases to other organs in addition to the stomach, outcomes were worse (range 4 weeks to 36 months survival) than in those with isolated gastric metastases (range 4 weeks survival to alive after 6 years). Nearly half of the cases with widespread metastatic disease did not survive beyond 6 months, although several papers did not report survival data.

Of the 10 patients who received surgical intervention for isolated gastric metastases, 5 were cancer-free after 2-18 months. As only 7 cases in this category had published survival statistics, it is evident that surgical intervention carries symptomatic benefit in these patients, as well as the potential for curative treatment.

Overall survival for patients with RCC metastases to the stomach ranged from 4 weeks to alive after 6 years.

Discussion

Gastric metastases from RCC are rare and usually present with significant upper gastrointestinal haemorrhage.

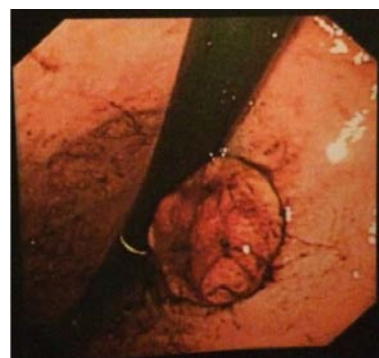


Figure 1: Ms DA – nodular gastric metastasis with mucosal ulceration.



Figure 2: Mrs HB – bleeding mass with overlying mucosal ulceration in the greater curvature of the stomach.

Table I: Case Reports of Gastric Metastases in RCC.

Paper	Year	Age (years)	Sex	Presenting Complaint	Interval Post-Nephrectomy (years)	Location	Number of lesions	Type of Lesion	Treatment	Other Metastases	Survival outcomes	Ref.
Sullivan et al.	1980	69	M	Melaena	7.5	Antrum	Single	Polypoid	Antrectomy	None	-	[17]
Bisesti et al.	1984	64	M	Chest pain	14	Antrum	Single	Ulcer	Subtotal Gx	None	-	[18]
Nakamura et al.	1984	65	M	Melaena	9	-	-	-	Partial Gx	Ileum	Died 33 days post-op	[19]
Ibáñez Olcoz et al.	1989	60	F	Melaena	1.8	Body	Multiple	Polypoid	None	Lung, brain	-	[20]
Márquez et al.	1992	70	M	Melaena	0.1	Body	Single	Ulcer	None	Lung	Died after 4 weeks	[21]
Durous et al.	1992	66	M	Anaemia	12	Fundus	Multiple	-	Interferon	Lung, parotid	-	[22]
Otowa et al.	1992	61	F	Haematemesis	0	Body	Multiple	-	Total Gx	None	Died 3 months post-op	[23]
Herrera Puerto et al.	1993	63	M	Haematemesis	0.1	Antrum	Single	Ulcer	None	None	Died 4 weeks post nephrectomy	[24]
Boruchowicz et al.	1995	48	M	Dysphagia	1.3	Fundus	Single	Polypoid	Chemotherapy	Lung, liver, oesophagus	-	[25]
Blake et al.	1995	63	M	Haematemesis	6	-	Single	Tumour	Palliative embolization	Lung	Alive after 5 months	[26]
Odori et al.	1998	59	M	Asymptomatic	4.4	Body	Single	Ulcer	Total Gx	None	No tumour recurrence at 17 months	[27]
Picchio et al.	2000	50	F	Melaena	14	Body	Single	Polypoid	Subtotal Gx	None	No tumour recurrence at 6 months	[28]
Mascarenhas et al.	2001	66	M	Haematemesis	7	Body	Single	Ulcer	Partial Gx	Lung, pleura	Died after 36 months	[29]
Suárez-Ortega et al.	2004	70	F	Melaena	0	-	Multiple	Polypoid	Palliative	Lung	-	[30]
Kobayashi et al.	2004	78	M	Anaemia	6.2	Body	Single	Not stated	Gx (NOS)	None	Died after 5 months	[31]
Kok et al.	2004	60	M	Melaena	20	Body	Multiple	Tumour	-	-	-	[32]
Suárez Fonseca et al.	2004	61	F	Melaena	4	Body	Single	Polypoid	Palliative	Lung	-	[33]
Lamb et al.	2005	69	F	Haematemesis	3	Body	Single	Tumour	Palliative embolization (x6)	Lung	Died after 23 months	[34]
Portanova et al.	2006	67	F	Melaena	5	Body	Single	Polypoid	Total Gx	Pancreas	Alive after 2 weeks	[35]
Hollerbach et al.	2006	56	M	Anaemia	-	Body	Multiple	Polypoid	Endoscopic mucosal resection	None	-	[36]
Riviello et al.	2006	68	M	Melaena	11	Fundus	Single	Polypoid	Total Gx, chemotherapy	Lung, spleen, pancreas, liver, lymph nodes	Died after 2 years	[37]
Saidi et al.	2007	-	-	Melaena	10	Body	Single	Polypoid	Wedge Rx	None	Disease free after 18 months	[38]
Pezzoli et al.	2007	78	M	Anaemia	5	Body	Multiple	Polypoid	Electrosurgical snare resection	-	Died after 6 months	[3]
Haffner et al.	2007	80	M	Anaemia	0	Fundus	Multiple	Ulcer	Endoscopic ablation	Lung	Alive after 5 months	[39]
Ko et al.	2008	71	M	Abdominal mass	-	Body	Multiple	Tumour	-	Lung	-	[40]
Roh et al.	2008	60	F	Dyspepsia	8	Body	Multiple	Polypoid	Subtotal Gx	None	-	[41]
Pollheimer et al.	2008	69	M	Abdominal pain	4.2	Body	Single	Ulcer	Tamoxifen	Lung, bone, adrenal	Died after 19 months	[5]
Pollheimer et al.	2008	77	M	Asymptomatic	6.3	Antrum	Single	Ulcer	Interferon	Lung, bone	Died after 4 months	[5]
Pollheimer et al.	2008	83	F	Melaena	1.7	Antrum	Multiple	-	Endoscopic ablation, Interferon	Lung, liver, pancreas	Died after 5 months	[5]
Pollheimer et al.	2008	65	F	Haematemesis & Melaena	13.1	-	Multiple	-	Endoscopic ablation	Lung, brain	Died after 3 months	[5]
Pollheimer et al.	2008	69	M	Abdominal pain	9.3	Body	Multiple	-	Endoscopic ablation, Sunitinib	Lung, bone	Alive after 2 years	[5]
Maeda et al.	2009	49	M	Anaemia	1.7	Body	Single	Polypoid	Partial Gx	-	-	[42]
Kibria et al.	2009	53	M	Melaena	0	Fundus	Single	Polypoid	None	Lung, bone	Died after 2 months	[8]
Yamamoto et al.	2009	74	M	Melaena	5	Body	Single	Polypoid	Wedge Rx	Brain	Died 1 month post-op	[4]

Sugasawa et al.	2010	69	M	Melaena	19	Fundus	Single	Ulcer	Wedge Rx	None	Disease free after 12 months	[43]
Tiwari et al.	2010	58	F	Haematemesis & Melaena	0	Antrum	Single	Polypoid	Subtotal Gx	Lung	Died 2 months post-op	[7]
Palade et al.	2011	-	-	Melaena	8	-	Single	Ulcer	Partial Gx	Lung, brain, bone	-	[44]
Cruz et al.	2011	56	F	Melaena	6	Antrum	Single	Tumour	Subtotal Gx	Lung, brain	-	[45]
Eslick et al.	2011	65	M	PR Bleeding	9	Body	Single	Ulcer	Endoscopic polypectomy	None	Alive after 6 years	[2]
Rodrigues et al.	2012	45	F	Haematemesis	9	Body	Single	Ulcer	Sunitinib	Lung, ovary	Died after 4 months	[46]
Namikawa et al.	2012	65	M	Mass on CT	23	Body	Single	Polypoid	Wedge Rx	None	Disease free after 2 months	[9]
Gómez-de-la-Cuesta et al.	2012	87	F	Melaena	4	Body	Multiple	Polypoid	Palliative	Lung, pancreas	-	[10]
Siriwardana et al.	2012	71	M	Anaemia	3	-	Single	Polypoid	Endoscopic mucosal resection	None	Disease free after 15 months	[47]
Kim et al.	2012	79	M	Abdominal pain	0	Body	Single	Ulcer	Endoscopic submucosal dissection	None	Disease free after 6 months	[6]
Thoufeeq et al.	2012	59	F	Dyspepsia	3	Fundus	Single	Polypoid	Sunitinib	Brain	-	[48]
Onorati et al.	2013	80	-	-	20	-	-	-	-	-	-	[49]
Sakurai et al.	2014	61	M	Melaena	2	Body	Single	Polypoid	Partial Gx	Lung, bone, brain	Died 4 months post-op	[50]
Ikari et al.	2014	64	M	-	22	-	Single	Tumour	Endoscopic submucosal dissection	None	Disease free after 30 months	[51]

Treatment Modalities

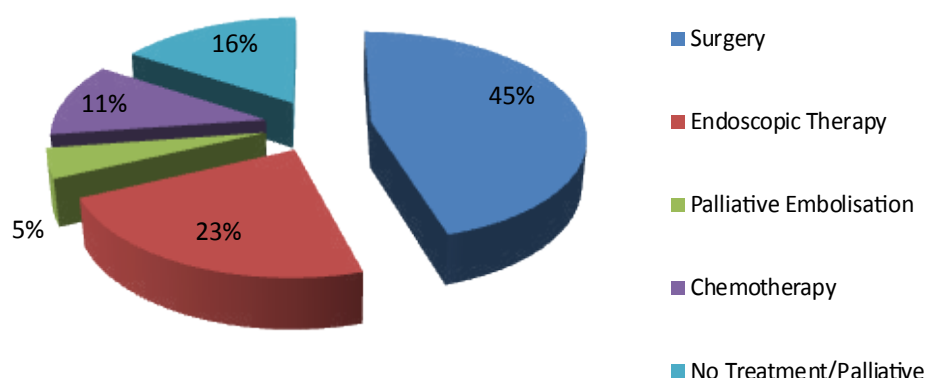


Figure 3: Treatment Modalities for Management of Gastric Metastases in RCC (n = 44).

Establishing the histopathological differentiation between metastatic disease and other tumours such as primary gastrointestinal stromal tumours (GIST) is essential in determining the appropriate treatment [9].

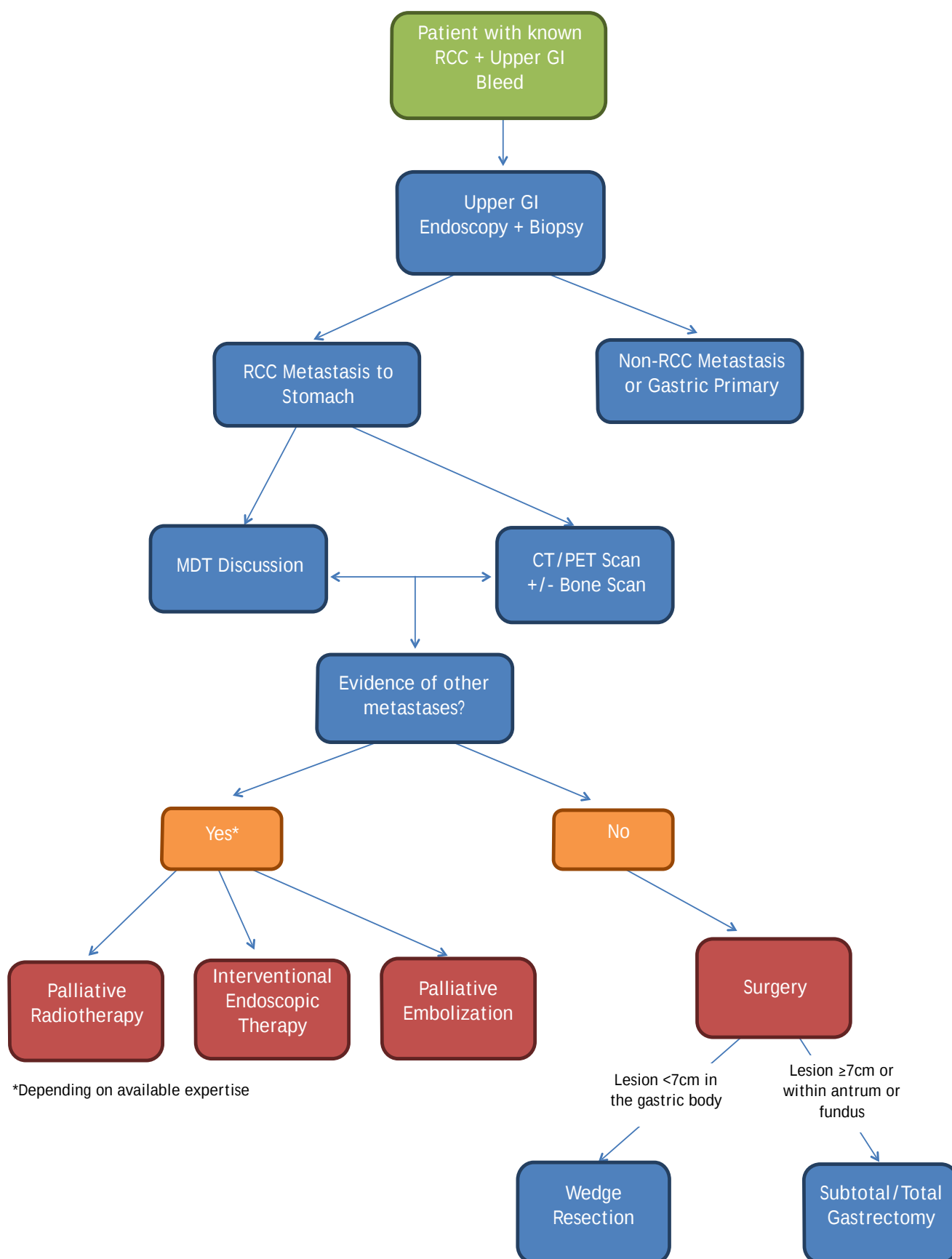
Laparoscopic wedge resection is the treatment of choice for isolated small/medium gastric tumours (<7 centimetres) near the greater curvature of the stomach as it is associated with quicker recovery in comparison to open procedures [10]. Saidi et al. (2007) report one case where this resection technique was used in a patient with an isolated gastric metastasis of RCC origin, after which they remained disease-free 18 months following surgery. Our patient is one of the longest surviving patients after laparoscopic wedge resection for isolated gastric RCC metastasis and remains disease-free 8 years post-surgery.

Subtotal and total gastrectomies are more frequently reported and are used to treat larger tumours or those which are localised within the antral or fundal regions of the stomach [2,11]. In the cases reviewed, all

patients who underwent wedge resection in the absence of metastases to other organs were disease-free after 2-18 months with no evidence of further bleeding.

Endoscopic clipping is used to achieve haemostasis in upper GI bleeding, although it is also a technique used to localize gastric or oesophageal tumours to aid external beam radiotherapy [12]. Radiotherapy to gastric tumours is primarily utilised to palliatively treat symptoms of bleeding, pain and dysphagia [13,14]. To the best of our knowledge, there are no case reports on gastric metastases from renal carcinoma in which radiotherapy has been used as a treatment modality for cessation of bleeding.

Given the relatively small number of patients who develop gastric metastases from RCC, it would not be feasible to conduct trials to determine which interventions have the best outcomes. Hence, based on our experience and our literature review, we propose the following paradigm for treating gastric metastases from RCC primary (Figure 4)



RCC: Renal Cell Carcinoma; MDT: Multidisciplinary Team; CT: Computed Tomography.

Figure 4: Treatment Paradigm for Management of Bleeding Gastric RCC Metastases.

Discussion of such cases in a multi-disciplinary setting is critical. It is thought that oncology patients who are discussed at such meetings often have better outcomes [15,16].

Conclusion

Gastric metastases in RCC are uncommon, but not as rare as once thought. They can cause significant haemorrhage and are generally associated with poor prognosis. Treatment should be patient-tailored depending on general condition at time of presentation, presence of extra-gastric metastases and the available resources and expertise. However, based on both our experience and the literature, we suggest that surgical intervention has good therapeutic and prognostic benefit in patients with isolated metastatic disease to the stomach. On the other hand, for those with widespread metastatic disease, other management options, if available, including embolization therapy, endoscopic submucosal resection and chemotherapy, should be considered. Furthermore, we advise that radiotherapy should also be considered as a viable option in the management of patients with bleeding lesions and concurrent metastases.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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Impacted Foreign Body in the Infratemporal Region: Case Report

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Abstract

The incidence of retained foreign body deep in the maxillofacial region has increased greatly in recent years. Retained foreign bodies following a penetrating trauma may pose a diagnostic difficulty for an Oral and Maxillofacial surgeons. The case of XR-negative impacted foreign body located deep in the infratemporal region is described. The operation was carried out under local anesthesia and impacted by foreign body (plastic pen cap) was found by deep finger palpation, grasped with a hemostat and retrieved out successfully.

Keywords: Foreign bodies; Infratemporal region; XR-negative objects

Abbreviations: CT: Computerized Tomography

Introduction

Foreign bodies are often encountered by oral and maxillofacial surgeons and may present a diagnostic challenge to the trauma surgeon due to many factors such as the size of the object, the difficult access, and a close anatomic relationship of the foreign body to vital structures. They are usually a result of injuries or operations [1-3]. Fragments of broken instruments can be left behind and entire teeth or their fragments can be displaced during extraction. In particular, penetrating injuries represent a rare but a complex variety of craniofacial trauma. Generally, the penetrating material is stiff enough to cross through different anatomic structures during a particularly violent collision caused by a road or work accident or during an attack. The therapeutic strategy adopted for this type of patient depends mainly on diagnostic procedures such as skull radiograms in different projections, computerized tomography, magnetic resonance imaging, and, occasionally, echo tomography [1,4,5]. Removal of the foreign body can be delayed in approximately one third of all foreign bodies because they are initially radiologically missed or misdiagnosed [6]. The approach to this kind of injury should be sequential and multidisciplinary, beginning with the trauma unit that will provide maintenance of the airways, hemodynamic stabilization, and, but only if necessary, neurologic, ophthalmologic, and vascular evaluation [7]. The case of an infratemporal region impacted foreign body, caused by a stabbing weapon is presented.

Case Report

A 33-year-old male patient was admitted to ENT and Maxillofacial Surgery department with a complaint of painful swelling over his left cheek and evident limitation of mouth opening for three days. He gave a history of drunken brawl in which he got a stab on the left cheek area. On examination the patient was conscious and well oriented. His vital signs were normal. There was a small laceration measuring approximately 1.0 cm in the left parotidea-masseteral region (Figure 1). The lacerated area was swollen with a little bruise and there was no neurosensory dysfunction. The mouth opening was limited up to 1.5 cm and painful. The oral cavity clinical examination did not reveal any pathology: there was no open communication into the oral cavity. The CT scan examination showed 2.7 × 0.38 cm cylindrical XR-negative gaseous zone, which was at the depth of 3 cm from the skin in the infratemporal region with the distal end between condylar and coronoid processes (Figure 2a-c). As an additional finding left side maxillary sinusitis and hypertrophic rhinitis were revealed.

The patient was taken up for surgery under local anesthesia for wound revision. The 2 cm long incision was done from the upper point of wound laterally and parallel to facial nerve buccal branch. The skin and SMAS were excised and the deeper tissues were opened by blunt dissection. Finger was used as a tactile sensor in the surgical pocket to probe the object (Figure 3). His distal end was at the depth of 3-3.5 cm from skin. The tissue tunnel was performed, when the finger was kept approximately 1 minute in touch with foreign body edge. Once the finger was located precisely the embedded foreign body was grasped with a haemostat and was retrieved out successfully. The retrieved object was a plastic pen cap (Figure 4). It was estimated, that the stab was done by the pen with cap, and after pen removing the cap was stuck in the surrounding soft tissues, may be because of mandible movement at that moment. The wound was inspected for hemostasis, a rubber ribbon drain was inserted, and the wound was closed in layers. The patient was prescribed routine antibiotics. The drain was removed on the second postoperative day (Figure 5). Sutures were removed on the seventh postoperative day (Figure 6). No facial nerve branch injuries or salivary fistulas were observed in postoperative period.

Discussion

The incidence of retained foreign body deep in the maxillofacial region has increased greatly in recent years [1]. Retained foreign bodies following a penetrating trauma may pose a diagnostic difficulty for an Oral and Maxillofacial surgeons [2]. The foreign body can often modify the regional anatomy [8]. Inflammatory response in the tissues around a foreign body can add difficulties [9]. Patient history, physical examination, and radiographic examinations may not confirm the presence of a foreign body [5,10]. The clinical examination of the patient who presented an impacted object injury in the face should be carried out in a systematic manner [11]. The paranasal region is the most affected by this kind of injury, and it is important to observe the

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Figure 1: External view of patient before operation.

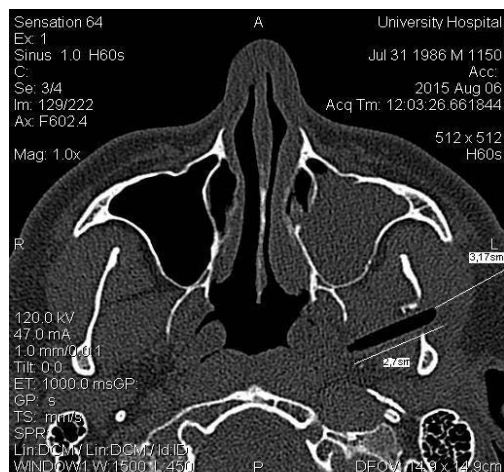


Figure 2a: CT of the head: axial plane.



Figure 2b: CT of the head: coronal plane.

major anatomic structures, such as the facial nerve and the parotid gland and duct [12].

Metallic objects are radiopaque and mostly are clearly visible on plain radiographs itself [13]. Though a surgeon might still desire a CT scan for precise location and accurate diagnosis of these metallic objects [9]. Wood or bamboo foreign bodies are difficult to diagnose if they are placed very deeply [14]. Radiological examination including three dimensional CT enables the surgeon to choose the optimal surgical approach to remove the foreign body, thereby avoiding purulent inflammatory complications [15]. Wooden or bamboo foreign bodies in both fat and soft tissues may present in CT patterns simulating as different as a gas bubble or a bone fragment [13,14]. In our case plastic

pen cap has shown the gas cylinder that was observed deep in the infratemporal region, horizontally, close to the nasopharynx.

Foreign bodies may migrate within the tissues and become symptomatic after a certain time lapse. In these cases, it is very difficult to correlate the direct relation between the suspected foreign body and the present clinical symptoms. One should therefore suspect a foreign body when presented with a laceration due to a blow [16]. In our case, the patient gave a history of drunken brawl in which he got a stab on the left cheek area, which gave us an idea for knife injury and, as a result, mandible fracture or any remaining foreign body. Removal

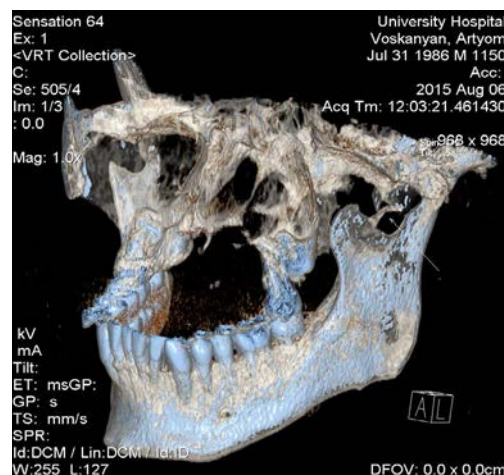


Figure 2c: CT of the head: 3-D reconstruction.



Figure 3: The intralesional palpation.



Figure 4: Removed plastic pen cap.



Figure 5: External view of patient on second postoperative day.



Figure 6: External view of patient on seventh postoperative day.

of the foreign bodies can be delayed because of a misdiagnosis or because of their asymptomatic behavior [6]. In the reported case the patient complained of painful swelling over his left cheek and evident limitation of mouth opening for 3 days. The first thing we thought was the mandible condyle fracture, as a result of knife injury, and CT scan examination was organized.

Treatment of penetrating lesions located in the maxillofacial region can vary according to the lesion's etiology, the nature of the retained foreign body, the site of the lesion, as well as extension of damage to soft and hard tissues of the region and neighboring structures [2]. It should initially prioritize the patient's stabilization with evaluation and maintenance of the upper airways, followed by hemodynamic control and neurologic evaluation [17]. Only after this treatment the foreign body should be carefully removed, preferably under general anesthesia [5,18]. When the impacted object is superficially confirmed by imaging examinations and it is not near any major vessel, the removal under local anesthesia can be performed. In presented case we have carried out operation under local anesthesia in spite of the fact, that impacted foreign body was located deep in the infratemporal region. The finger is the most sensitive probe and will readily palpate the buried foreign body [19]. If a long curved hemostat is passed along the line of finger, the foreign body can be grasped and removed by an experienced surgeon through a relatively small wound. In such manner we have done the reported operation.

The wound should be explored, followed by hemostasis, copious irrigation with saline solution and suture for planes [20]. It is advisable to prescribe antibiotics before and after surgery, as well as tetanus prophylaxis [7,16,18].

Conclusion

Timely removal of impacted foreign bodies in the maxillofacial region may avoid functional, allergic and infective complications. This case demonstrated foreign body retrieval which was impacted in the infratemporal region. Preoperative CT imaging is a prerequisite for the diagnosis and accurate localization of the foreign body. The case describes, that intralesional finger palpation could be a sensitive and helpful probe for foreign bodies finding and removal.

Conflict of interests

Authors have no conflict of interests to declare

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Gastric Cancer in Pregnancy in China: Case Reports and a Mini-Review

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Abstract

Gastric cancer associated with pregnancy is quite rare, and it is often diagnosed late due to misinterpretation of clinic presentations as pregnancy-related digestive symptoms. Most pregnancy-associated gastric cancer is often at its advanced stage at the time of diagnosis. The difficulties in the early diagnosis of gastric cancer in pregnant women deter timely surgical treatment for the disease. We reviewed the existing literature using the key words “pregnancy” and “gastric cancer”. 65 cases, including 62 cases reported previously in China and 3 cases that we report here, were accumulated. The analysis of these and other 29 cases from Japan revealed that the pathology of such kind of tumor mostly were poorly differentiated diffuse carcinomas. Some further examinations should be conducted timely on the pregnant patients with persistent gastrointestinal symptoms for the differential diagnosis of hyperemesis gravidarum. As soon as gastric cancer was diagnosed, a therapeutic plan should be promptly made by obstetric and gastric cancer specialists.

Keywords: Gastric cancer; Pregnancy; Diagnosis

Introduction

Cancer associated with pregnancy is rare. The incidence of cancer during pregnancy accounts for approximately 0.1% [1]. As women defer childbearing to the third or fourth decade of life, this rare coexistence is likely to become more common. The common malignancies associated with pregnancy include malignant melanoma, breast cancer, cervical cancer, lymphoma, ovarian cancer, gastrointestinal cancer and genitourinary cancer [2]. Gastric cancer in pregnancy is often diagnosed late due to misinterpretation of clinic presentations as pregnancy-related digestive symptoms. The difficulties in the early diagnosis of gastric cancer in pregnant women deter timely surgical treatment of the disease.

In an analysis by Sakamoto et al. that includes 137 cases of pregnancy-associated gastric cancer from Japan, most cancer were at advanced or late stages at the time of diagnosis, which to a large extent would cause dilemma for surgeons [3]. Here we reported our cases and reviewed literatures from China in order to analyze the clinicopathological characters of pregnancy-associated gastric cancer and shed light on the early diagnostic strategies.

Materials and Methods

1. The database of Peking University Third Hospital was searched for the cases of pregnancy-associated gastric cancer that were treated at the Department of General Surgery from 2001 to 2014.

2. A literature search was conducted on China National Knowledge Infrastructure (CNKI), VIP database, WANFANG DATA, and the China Biology Medicine Disc by using “gastric cancer” and “pregnancy” as key words. Inclusion criteria were as follows: (1) literatures were published in the last two decades, (2) original documents and detailed clinic and pathological data were preserved, (3) not less than 3 cases of gastric cancer during pregnancy or within 1 year after delivery were reported in the article.

Results

Case report

Among 863 gastric cancer patients, 3 were associated with pregnancy. The clinicopathological data of these cases were illustrated in Table I. These 3 patients all experienced nausea and vomiting

during the second or third trimester, while they were diagnosed with hyperemesis gravidarum or pregnancy-associated manifestation and with no further investigation or treatment. When admitted to our hospital, their symptoms failed to improve and laboratory tests showed anemia and hypoalbuminemia. Through gastrointestinal endoscopy, they were all diagnosed as gastric cancer. Two pregnant women chose induced labor to terminate their pregnancy. Due to advanced tumor stage and multiple metastases, one of the patients lost the chance of tumor resection. Other two accepted the surgical treatment. Despite all this, three patients all died of the progression of cancer from one to six months after the diagnosis.

Literature research

There are a total of 65 cases included in our study, three of which are from our department and 62 from 9 literatures [4-11]. In order to help clinicians formulate the best treatment plan, we present a comparison of the data collected from China and Japan.

Two tables (Table II and III) show the clinicopathological features of the 65 patients from China and 29 patients from Japan. Most of the patients (76.9%) were diagnosed by gastroscopy. With respect to the stage of gastric cancer, all patients were found to have advanced gastric cancer. The most common macroscopic feature was the infiltrative type (Borrmann III and IV) (76.5%). Regarding the pathological features, the diffuse type (poorly differentiated adenocarcinoma, mucinous adenocarcinoma, signet ring cell cancer) was most common (92.3%). In regard to the obstetric management of pregnant women with gastric cancer, no detailed record was reported in Chinese patients.

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Table I: Clinicopathological data of 3 cases treated in Peking University Third Hospital.

Patient age(years)	Weeks of gestation	Symptoms					Pathology		Treatment
		Abdominal pain	Abdominal distension	Nausea and vomiting	Melena	Weight loss	Macroscopic type	Histological type	
29	26	-	-	+	+	+	Borrmann III	Moderately differentiated adenocarcinoma	Pancreaticoduodenectomy
31	24	-	+	+	-	-	Borrmann IV	Poorly differentiated adenocarcinoma	No surgery
36	post-partum	+	-	+	-	+	Borrmann III	Poorly differentiated adenocarcinoma	Palliative subtotal gastrectomy

Table II: Clinical features of Chinese and Japanese patients diagnosed with pregnancy-associated gastric cancer.

	China (1993-2014)	Japan (1988-2007)
No. of patients [No. (%)]	65	29
Patient age (years)		
20-29	26(40.0)	9(31.0)
30-39	8(12.3)	13(44.8)
>40	1(1.5)	7(24.1)
Unknown	30(46.2)	0
Weeks of gestation [No. (%)]		
<24	11(16.9)	9(31.0)
24-27	6(9.2)	2(6.8)
≥28	13(20.0)	13(44.8)
post-partum	35(35.8)	5(17.2)
Diagnostic method [No. (%)]		
Endoscopy	50(76.9)	22(75.8)
Ultrasound	1(1.5)	0
Upper GI series	9(13.8)	0
Palpable tumor or lymph nodes	0	1(3.4)
Laparotomy	2(3.1)	3(10.3)
Unknown	3(4.6)	3(10.3)
Disease status [No. (%)]		
Early	0	2(7.0)
Advanced	65(100.0)	26(89.7)
Unknown	0	1(3.4)

According to the record of Japanese cases in the last two decades, a majority of patients (7/9) prior to week 24 of gestation selected surgical intervention after termination of pregnancy. All the patients (13/13) at week 28 of gestation and beyond implemented cesarean section or vaginal delivery, as well as two patients at week 24 to 27 of gestation carried out cesarean section. The survival rate of gastric cancer for the patients with pregnancy is far lower than those without pregnancy at the corresponding time period (Table III).

Discussion

As far is known, there is no clear definition of gastric cancer associated with pregnancy. In current literature, patients who are diagnosed with gastric cancer during pregnancy or within one year of childbirth are included [1,3,12,13]. Although the incidence of gastric cancer is in the second place among all malignancies around the world, the rate of gastric cancer during pregnancy is reported to be only 0.016% in Japan, a gastric cancer prevailing area [14]. In South Korea, among 14,563 patients with primary gastric cancer admitted at Seoul National University Hospital, only 15 patients (0.103%) were identified as pregnancy-associated [1]. There were only 3 patients (0.36%) with gastric cancer associated with pregnancy admitted at Department of General Surgery in the Third Hospital of Peking University, among 838 patients with primary gastric cancer during the period of 2001 to 2014.

Many factors may lead to the delayed diagnosis of gastric cancer associated with pregnancy. First of all, the incidence of gastric cancer

associated with pregnancy is uncommon. For this reason, gastric cancer might not be the first differential diagnosis for pregnant women with digestive symptoms in most of the cases. Secondly, gastric cancer symptoms can easily be concealed by pregnancy-related digestive symptoms. Pregnancy can decrease the secretion of acid in the stomach and increase mucus production at the same time. On the other hand, histaminase produced by the placenta deactivates histamine function. These factors will decrease the body sensitivity to cancerous ulcer injury. Jaspers et al. pointed out that the incidence of gastric cancer was not obviously different between pregnant women and other young people, but there was often a delay in diagnosis in pregnant women due to the lack of attention to upper abdominal discomfort during pregnancy [13]. Finally, the diagnostic measures are especially restricted for pregnant women. For instance, radiological examinations are not suitable for pregnant women and the safety of endoscopy is also questioned. All our 3 cases were delayed in diagnosis. One was considered to be hyperemesis gravidarum, and the other two were mistaken for digestive symptoms associated with pregnancy.

In our opinion, the causes of the poor prognosis of gastric cancer in pregnancy could be coming from many aspects. Firstly, most patients were found to have advanced cancer on diagnosis. Our data revealed that in all reported cases the tumors were diagnosed at an advanced stage. 83.6% of patients underwent surgery but only 14.3% of them had curative resection. In the Japanese data, 26 out of 29 patients had advanced gastric cancer at diagnosis. Secondly, a majority of patients had highly malignant tumor. In China, the percentage of infiltrative type (Borrmann III and IV) is 76.9%, and the percentage of diffuse type (poorly differentiated adenocarcinoma, mucus adenocarcinoma, signet ring cell cancer) is 92.3%, of which signet ring cell cancer accounts for 30.8%. Sakamoto et al. analyzed the pathology of the tumors in the 61 patients whose data were available [3]. The results showed that the percentage of infiltrative type and diffuse type were 83.6% and 86.9% respectively in gastric cancer associated with pregnancy.; Thirdly, the change of local biology in the stomach promotes the development of neoplasms during pregnancy. According to a report by Lanciers et al, *H. pylori* infection rate is significantly higher for pregnant women than non-pregnant women [15]. Given that circulatory blood flow increases and immunity attenuates during pregnancy, pregnant women are particularly susceptible to the rapid growth and spread of cancer [14]; besides, treatment is comparably restricted due to pregnancy. Ueo et al. have recommended that surgical treatment for gastric cancer should be immediately performed without regard for the pregnancy when gastric cancer is diagnosed prior to week 24 of gestation; At weeks 25 to 29 of gestation, the decision should depend on the stage of the gastric cancer as well as the resectability of the tumor; For week 30 of gestation and beyond, obstetric treatment followed by surgical intervention is recommended to guarantee the infant to be viable by cesarean section or vaginal delivery [12]. As the definition of abortion in Japan was revised in 1993, the above three categories correspond to prior to 22 weeks, 22 to 27 weeks as well as 28 weeks and beyond, respectively [3]. In our cases, two patients at week 23 to 27 underwent pregnancy termination because of their late tumor stage or poor nutritional condition, and then were delayed for the time of surgery or adjuvant therapy.

Table III: Pathology of tumors, surgical treatment, prognosis and obstetric management in Chinese and Japanese patient diagnosed with pregnancy-associated gastric cancer.

	China	Japan
Macroscopic type		
Localized type	1(1.5)	4(13.8)
Infiltrative type	50(76.9)	20(67.0)
Unknown	14(21.5)	5(17.2)
Histological type		
Intestinal type	5(7.7)	4(13.8)
Diffuse type	60(92.3)	19(65.5)
Signet ring cell type	20(30.8)	9(31.0)
Unknown	0	6(20.7)
Resectability		
No surgery	8(12.3)	7(24.1)
Surgery	57(87.7)	21(72.4)
Exploration or bypass	23(35.4)	4(13.8)
Gastrectomy	34(52.3)	17(58.6)
Unknown	0	1(3.4)
Management of obstetrics		
Abortion or induction of labor	11(16.9)	9(31.0)
Cesarean section or vaginal delivery	10(15.4)	15(51.7)
Diagnosed after delivery	37(56.9)	5(17.2)
Unknown	7(10.8)	0
Prognosis		
Patient alive at 12 months	8(12.3) ^b	10(37.0) ^a
Patient alive at 24 months	3(4.6) ^b	6(22.2) ^a
Patient alive at 36 months	2(3.1) ^b	

^aThe prognosis of 27 Japanese patients was recorded.

^bThe prognosis of 62 Chinese patients was recorded.

The impact of gastric cancer associated with pregnancy on fetus should be taken into account when deciding treatment. The perinatal mortality of the fetus is greatly influenced by the treatment methods. According to the statistical data from Jaspers's data, the prognosis for the fetus is favorable with 72% surviving. For pregnancies ≥ 30 weeks, only two babies died out of 29 cases [13]. With the development of perinatal medicine, fetal survival rate has gradually increased. The other factor impacting fetal survival is the potential occurrence of fetal tumor metastasis. Neonates delivered with concomitant placental or villous cancer involvement should be considered a high-risk population. Alexander et al. found that fetal risk of melanoma metastasis is approximately 22% with placental involvement [16]. There were less than 10 case reports of gastric carcinoma metastatic to the placenta, none of which found villous invasion or fetal metastasis.

On the basis of the clinical and pathological features of gastric cancer associated with pregnancy, early diagnosis is the only possibility for the better outcome. Eliakim et al. indicated that digestive symptoms would gradually remit after 16 weeks of gestation in 90% of patients with hyperemesis gravidarum and completely remit by 20 weeks in 99% of patients [17]. Most researchers emphasized that active examinations should be taken into account for pregnant women with persisting digestive symptoms. At present, the ultrasonography and gastroscopy are the main methods for gastric cancer patients in pregnancy.

Compared with endoscopy, ultrasonography could display both the intragastric and perigastric lesions and also the depth of invasion, with the advantage of noninvasion, economy and repeatability. Seevaratnam et al. made a meta-analysis about preoperative imaging for TNM staging of gastric cancer. The results showed the primary tumor detection rates ranged from 90.7 to 100 and the overall accuracy was $67.8\% \pm 10.8\%$ for ultrasonography [18]. Ultrasonography has guiding significance for further investigation. One of our cases showed a lesion of gastric wall by ultrasound, and then underwent endoscopy. But it is

debatable to diagnose the lesion of gastric fundus, tiny gastric cancer and small gastric cancer by ultrasonography.

Magnetic resonance imaging may be used to diagnose pregnancy-related gastric cancer. M. Anzidei et al. found that MRI and 64-MDCT accuracy levels did not differ in advanced stages of disease, whereas MRI was superior in identifying early gastric cancer [19]. K. M. Jang et al. analyzed a series of data of the patients who underwent gadoteric acid-enhanced MRI with diffusion-weighted imaging and multidetector contrast-enhanced abdominal computed tomography imaging [20]. They pointed out that the diagnostic accuracy and sensitivity of combined conventional and DW MRI set for detection of gastric cancer was significantly higher than that of the CT imaging set or the conventional MRI set. But it is still not clear whether MRI or gadoteric acid is safe for pregnant women or fetuses. MRI might be a valid alternative in clinical practice after finding a safer contrast agent instead of gadoteric acid.

Endoscopy can diagnose gastric cancer definitively and provide pathological biopsy. The safety of gastroscopy in pregnancy might hesitate pregnant patients. The potential risks of endoscopy include arrhythmia, hypertension, hypotension, hypoxemia, malformation, premature and so on. The research by Cappell et al. including 83 patients showed that gastroscopy didn't induce labor or result in congenital malformation [21]. No significant endoscopic complications occurred and none of the infants had a congenital malformation in the neonatal nursery. And compared with normal control group, neonatal Apgar scores were no significantly different. Another retrospective evaluation of 60 pregnant women also showed that endoscopy could be safely performed in pregnancy with no maternal and fetal complications [22]. American Society for Gastrointestinal Endoscopy outlined the main indications for endoscopy in pregnancy and general principles that apply to endoscopy in the Guidelines for Endoscopy in Pregnant and lactating Women. The safety of endoscopy could be greatly improved by following these indications and general principles [23].

Conclusion

In conclusion, the features of gastric cancer associated with pregnancy are the delayed diagnosis, high degree of malignancy and poor prognosis. Further examinations should be conducted timely in pregnant patients with persistent gastrointestinal symptoms for the differential diagnosis of hyperemesis gravidarum. When gastric cancer was diagnosed, a therapeutic plan should be promptly made by obstetrics and gastric cancer specialists.

Conflicts of interest

The authors declare that they have no conflicts of interest.

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Acute Surgical Repair of Large Incisional Hernia with Significant Loss of Domain: Case Report and Review of Literature

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Abstract

Introduction: Incisional abdominal hernias develop up to 11.5 % of laparotomy incisions. The most difficult to repair are hernias with significant loss of domain. The basic principle of treating abdominal incisional hernia entails restoring the anatomical and physiological integrity of the wall. Ideally, this involves the use of local musculo-aponeurotic tissue with a good blood supply and innervations. In the case of large defects, it is necessary to use alloplastic materials in order to reduce the tension load on the suture itself. Emergency surgery is indicated especially in the case of intestinal obstruction or strangulation.

Presentation of Case: The present report describes the case of emergency surgical treatment of intestinal obstruction in large abdominal incisional hernia by 77-year old man. We used reposition and onlay technique with biodegradable mesh to repair the abdominal wall.

Discussion: Emergency surgery for bowel obstruction primarily aims to resolve bowel obstruction and restore intestinal viability. In this case we present that techniques without bowel resection or stoma are safer as the other. Large hernias with loss of domain can be repaired only by an open method and the onlay method is the simplest and most versatile technique in this case.

Conclusions: Emergency surgery in incisional hernias is a challenging surgical problem due to risk of the preoperative and postoperative complications. Team involving general and plastic surgeons and anaesthetist is required.

Keywords: Hernia; Laparotomy incisions; Surgical repair

Introduction

Incisional hernias represent a relatively frequent iatrogenic complication of abdominal surgery, with an incidence between 3.8 to 11.5% [1]. The underlying causes vary. Risk factors mainly include older age, obesity, bowel surgery, wound infection, immunosuppression, smoking and chronic obstructive pulmonary disease. Treatment of large incisional hernias is associated with a number of risks and complications. These primarily include acute respiratory failure, acute renal failure associated with an abdominal compartment syndrome, disorders of intestinal motility and circulation. Late complications may include recurrence of hernia- in up to 30-50% of cases involving defects larger than 6 cm [2,3]. Incisional hernias with significant loss of domain are hernias where >15-20% of the abdominal contents reside permanently outside their natural compartment, and returning these contents will require significant physiological adaptation (mainly respiratory) [4]. Emergency surgery is indicated especially in the case of ileus and intestinal obstruction or if signs of intestinal ischaemia within the hernial sac appear. The basic principle of treating abdominal incisional hernia entails restoring the anatomical and physiological integrity of the wall. Ideally, this involves the use of local musculo-aponeurotic tissue with a good blood supply and innervations [5]. In the case of large defects, it is necessary to use alloplastic materials in order to reduce the tension load on the suture itself. Such materials include classical inorganic materials [6], which are however associated with a higher risk of complications such as infection and intestinal fistula [7]. Thus, biodegradable materials containing porcine small intestinal submucosa (SIS) are more advantageous. These materials promote healing, scar remodelling, angiogenesis at the site of the scar and represent an effective barrier against bacterial invasion [8].

Presentation of Case

A 77 year old man was admitted to our institution suffering from

abdominal pain, nausea, repeated vomiting of stagnant gastric content and elevation of inflammatory parameters. The underlying cause was bowel obstruction within a gigantic irreducible hernia. The patient had undergone cholecystectomy via a classical midline laparotomy 17 years previously with subsequent incisional hernia repair 5 years later. No further surgery was indicated given the patient's comorbidities- CAD, COPD, hypertension and diabetes. A conservative approach consisting of a hernia truss was recommended. The patient's risk factors for developing an incisional hernia included: obesity (height 170 cm, weight 117kg, BMI 40), COPD, diabetes, increased tension of the abdominal wall in a former professional trumpet player. The CT scan (Figures 1a,1b) revealed bowel obstruction in an otherwise well-vascularised small intestine loop and the right large intestine, which were pulled into the hernial sac. The X-ray series (Figures 2a,2b) described dilation of the small intestine loops and the contrast dye failed to progress at the level of the ileum. Acute surgical intervention for progressive ileus was indicated and commenced following necessary preparations including the insertion of a nasogastric tube and correction of the present mineral imbalance.

A central venous catheter and a Foley catheter were inserted once the patient was under general anaesthesia. Amoxicillin/clavulanic acid

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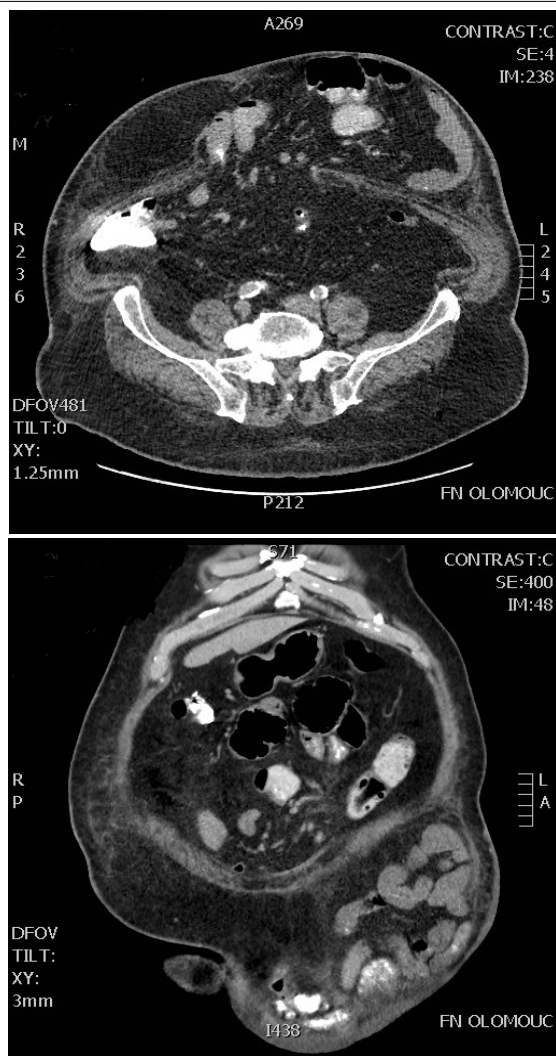


Figure 1 (a,b): CT scan of large incisional hernia.

was administered prophylactically. Then was the skin prepared and disinfected using a solution containing povidone-iodine. The incision was made through the initial site of the midline laparotomy dislocated to the right. The bulky hernial sac was identified and separated from the skin and subcutaneous structures. The hernial sac contained loops of the jejunum and ileum, the caecum, ascending colon and hypertrophied omentum. The intestinal loops were viable and only slightly distended. The hernia defect with a diameter of 20 cm was viable and firm musculo-aponeurotic structures were exposed. The omentum was resected and subsequently the loop of the small intestine and the colon were repositioned back into the abdominal cavity. Also the hernial sac was partially resected as well and its remains were used to cover the defect using interrupted absorbable sutures. The abdominal wall was closed using interrupted non-absorbable sutures and an onlay SIS mesh was placed on this suture. This was fixed using two continuous non-absorbable sutures. Further interrupted sutures were placed and fixed at the positions of 1,3,5,7,9,11 o'clock. Two Redon drains were placed subcutaneously between the onlay and the skin. The skin was closed using interrupted sutures and was not reduced. It was not possible to extubate the patient immediately after surgery as he developed acute respiratory distress. Thus, the patient was extubated at the ICU 6 hours after surgery, when his spontaneous ventilation was sufficient. Subsequently, we closely monitored his ventilation parameters, the onset of bowel movement and possible signs of intestinal ischaemia. The following parameters were also monitored. (Table I)

Ventilation parameters were tested before surgery and then on the 6th day after surgery and no fundamental changes were recorded (Table II). The drains were removed on the 5th day after surgery, once minimal secretion had been noted.

Bowel movement resumed on the third day after surgery. Hospitalisation was complicated by worsening of cardiac functions with right-sided heart failure that necessitated a change in the patient's medication, which led to improvement of the patient's condition. The patient was discharged on the twelfth day. No further complications occurred. Six-months and one year after surgery, the patient is symptom-free, the abdominal wall is firm and there are no signs of hernia recurrence.

Discussion

The systemic review of the literature targeting to the treatment and complications of incisional hernias with significant loss of domain and postoperative complication after this surgical techniques in Cochrane database and PubMed was created. Incisional hernias represent one of the most frequent iatrogenic complications of abdominal surgery. Several risk factors promote the development of these hernias. The ideal means of repairing abdominal incisional hernias involves midline reconstruction using native musculo-aponeurotic tissues [9]. Treatment of complex abdominal incisional hernias should be conversant with the different methods of placement of prosthetic materials and be able to deploy the techniques of abdominal components separation,

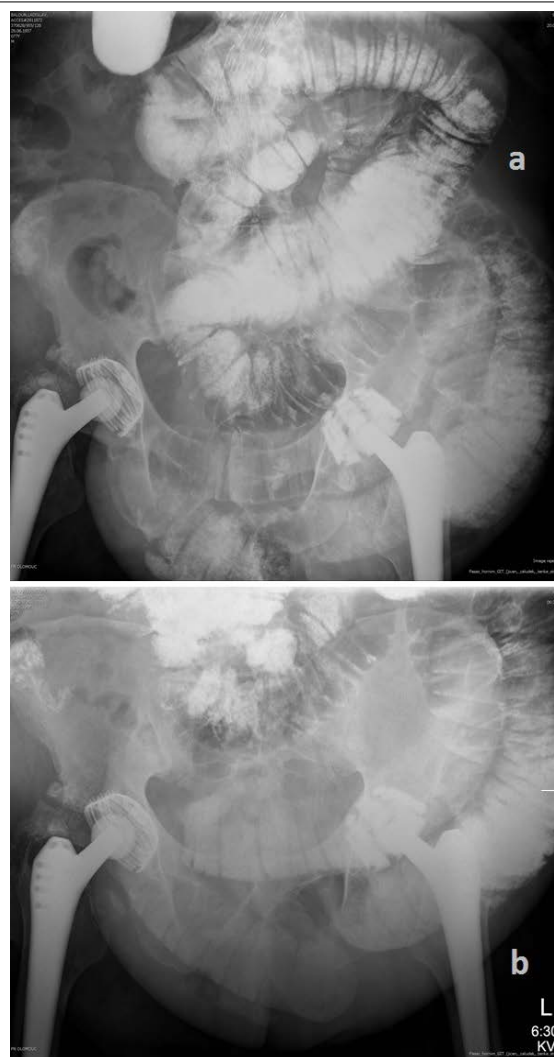


Figure 2 (a,b): X-ray series.

Table I: Extract of laboratory values.

Parameters	Norm		Postoperative day				
			0	1	2	3	6
Hemoglobin	135-175	g/L	120	117	114	108	111
Leukocytes	4.0-10.0	10 ⁹ /L	12.5	11.6	13.4	11.69	10.45
pH	7.35-7.45		7.33	7.42	7.4	7.43	7.41
Lactate	0.5-3.4	mmol/L	5.1	3.5	1.1	1.5	1.6
Potassium	3.5-5.1	mmol/L	3.37	4.23	4.01	4.2	3.9
Urea	2.8-8.1	mmol/L	12.3	7.2	11.6	14.2	10.3
Creatinine	64-104	μmol/L	137	110	143	171	117
IAP	0-20	mm Hg	21	23	12	12	10
CRP	0-5	mg/L	220	180	167	117	89

Table II: Respiratory parameters.

Parameters	VC max	FEV1	MEF25	TLC	RV	Raw
Normative	3.56	2.59	1.1	6.5	2.69	0.3
Preoperative	3.15	2.16	0.45	6.02	3.08	0.48
Postoperative	3.33	2.44	0.55	6.1	3.03	0.44

tissue expansion, local and distant muscle flaps, free tissue transfer and vacuum-assisted closure [10]. If such natural structures cannot be used for reconstruction, prosthetic materials such as onlays or inlays are used to reduce tension [2,4,6]. However, the use of these inorganic materials is associated with the risk of infection, extrusion, protrusion and intestinal fistula [7]. New biodegradable materials containing SIS allow midline reconstruction with minimal or no tension, especially given that they act as a mechanical binder that protects the sutured midline when intra-abdominal pressure increases [11,12]. These materials also stimulate the re-growth of the fascia and collagen growth and production, thus accelerating wound healing. They also reduce the risk of foreign material associated infection [7]. Incisional hernias with a hernia defect less than 6 cm in diameter are ideal candidates for reconstruction with minimum risk of recurrence. These small hernias can be repaired successfully by a laparoscopic approach [1]. Larger hernias are associated with a higher risk of recurrence, which is described in up to 50% of cases. By using alloplastic materials, the incidence of recurrence decreases to 10% and less [2,3]. Large hernias with loss of domain can be repaired only by an open method and the onlay method is the simplest and most versatile technique in this case [1].

Large incisional hernias with significant loss of domain represent a significant problem [4]. These hernias are usually encountered in patients in whom planned surgery had been contraindicated mainly because of patient comorbidities and anaesthesiological or surgical risk at the time or in patients who had been avoiding medical care. The most serious complication of these hernias is intestinal obstruction or strangulation. Resolution of acute conditions associated with gigantic hernias represents one of the most complicated cases in emergency surgery. Apart from the objective findings, diagnosis is based on a CT examination that determines the extent of herniation, the contents of the hernial sac and the perfusion of the intestinal wall. Laboratory parameters that we monitor include the leukocytes, CRP, lactate and pH, whereby pathological values usually indicate a disorder of intestinal perfusion. Monitoring of intraabdominal pressure as an indicator of intra-abdominal hypertension and the abdominal compartment syndrome in postoperative care is very necessary [13]. Abdominal compartment syndrome refers to organ dysfunction caused by intraabdominal hypertension. Intraabdominal pressure (IAP) is the steady state pressure concealed within the abdominal cavity [14]. For most critically ill patients, an IAP of 5 to 7 mmHg is considered normal. In a prospective cohort study of 77 supine hospitalized patients, the IAP averaged 6.5 mmHg and was directly related to body mass index [12]. Intraabdominal hypertension (IAH) is defined as a sustained intraabdominal pressure ≥ 12 mmHg [14]. Intraabdominal pressure can be further graded as follows: Grade I = IAP 12 to 15 mmHg;

Grade II = IAP 16 to 20 mmHg; Grade III = IAP 21 to 25 mmHg; Grade IV = IAP > 25 mmHg [15]. Abdominal compartment syndrome (ACS) is defined as a sustained intraabdominal pressure > 20 mmHg (with or without APP < 60 mmHg) that is associated with new organ dysfunction. IAH can impair the function of nearly every organ system (cardiovascular — IAH decreases cardiac output by impairing cardiac function and reducing venous return, pulmonary — mechanically ventilated patients with IAH have increased peak inspiratory and mean airway pressures, which can cause alveolar barotrauma, they also have reduced chest wall compliance and spontaneous tidal volumes, which combine to cause arterial hypoxemia and hypercarbia, and gastrointestinal with reduced mesenteric blood flow and intestinal mucosal perfusion). The goals of supportive care in patients with intraabdominal hypertension include reduction of intraabdominal volume through evacuation of intraluminal contents, evacuation of intraabdominal space-occupying lesions (eg, ascites, hematoma) when possible, and measures to improve abdominal wall compliance with ventilatory and hemodynamic support. Surgical decompression is indicated for all patients whose intraabdominal pressure is greater than 25 mmHg [16]. Most surgeons perform decompression and then maintain an open abdomen using temporary abdominal wall closure. Several techniques for temporary abdominal closure are available, including patch closure, negative pressure systems (towel and sponge-based), and silo closure. Each of these techniques has advantages and disadvantages with respect to their ability to control fluid loss, frequency of dressing changes, minimizing loss of domain, ease of use, and cost. The patch or silo technique can be used alone or in combination with a negative pressure system. Skin-only closures are an option but are rarely used in contemporary practice [17].

We present here the case report of a man with a gigantic incisional hernia and signs of small bowel strangulation as an example of the extreme symptomatology of such a hernia in a patient with a number of comorbidities. Nonetheless, despite the monstrous size of the hernial sac, emergency surgery enabled the reposition of the organs back into the abdominal cavity as well as the repair of the abdominal wall with no negative consequences during the post-operative course [4].

In these types of emergency procedures, it is mandatory in the days following surgery to monitor the patient's ventilation parameters as well as to prevent the development of the intra-abdominal compartment syndrome or the progression of bowel obstruction and development of intestinal ischemia.

Conclusions

Incisional abdominal hernias develop up to 11.5% of laparotomy incisions. The basic principle of treating abdominal incisional hernia entails restoring the anatomical and physiological integrity of the wall. Large hernias with loss of domain can be repaired only by an open method and the onlay method is the simplest and most versatile technique in this case. Emergency surgery is indicated in case of intestinal obstruction and strangulation and is acquired with increasing

risk of postoperative complications. Emergency surgery for bowel obstruction primarily aims to resolve bowel obstruction and restore intestinal viability. In this case we present that techniques without bowel resection or stoma are safer as the other. Emergency surgery in incisional hernias is a challenging surgical problem and should be managed by a skilled team of general surgeons, plastic surgeons, anaesthetists and intensivists.

Key Learning Points

- Timing of indication for surgical repair in patients with large incisional hernia with significant loss of domain
- Prevention of development of IAH and ACS after hernia's repair with using damage control techniques such as open abdomen closure
- Primary aims for emergency surgical repair of large incisional hernia with significant loss of domain are to resolve bowel obstruction and restore intestinal viability. Reconstruction of the abdominal wall is secondary goal.

Conflict of interests

Authors have no conflict of interests to declare

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Laparoscopic Management of Hydatid Cyst in Children

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Abstract

Hydatidosis is a zoonosis produced by the larval stage of *Echinococcus granulosus*, with an endemic distribution, mainly in the rural areas. Frequently it is localized in the liver (60%) or in the lungs (30%), with most of the patients being asymptomatic. The positive diagnosis is based on ultrasonography, CT or MRI scans, as well as immunological studies (ELISA). The management of hydatidosis includes medical treatment with Albendazole in association with surgical treatment, which may be achieved by open surgery or laparoscopic approach. We present the case of a 5 year-old patient, who was admitted to hospital for recurrent episodes of epistaxis, shortness of breath and abdominal fullness and was diagnosed with hepatic and pulmonary hydatidosis. We decided to perform a laparoscopic Lagrot pericystectomy and postoperative medical treatment with Albendazole, with favorable outcome.

Keywords: Hydatid cyst; Echinococcosis; Liver; Surgical resection; Laparoscopy; Pericystectomy

Background

Hydatidosis is a zoonosis produced by the larval stage of *Echinococcus granulosus*, with an endemic distribution, mainly in the rural areas [1]. Frequently it is localized in the liver (60%) or in the lungs (30%), with most of the patients being asymptomatic [2]. The positive diagnosis is based on ultrasonography, CT or MRI scans, as well as immunological studies (ELISA) [2,3].

The management of hydatidosis includes medical treatment with Albendazole in association with surgical treatment. Surgical procedures vary from puncture-aspiration-injection-reaspiration (PAIR) to partial resection and they can be divided into conservative or radical surgeries [2]. When talking about the conservative procedure (Lagrot pericystectomy) the hepatic parenchyma is not damaged and the pericystic cavity is saved or partially removed, whereas in the radical procedure the pericystic membrane is removed along with a portion of the hepatic tissue. Surgical treatment may be achieved by open surgery or laparoscopic approach [4,5].

We present the case of a 5 year-old patient, diagnosed with hepatic and pulmonary hydatidosis, in which we decided to perform a laparoscopic Lagrot pericystectomy.

Case Report

We report the case of a 5 year-old patient, who was admitted to hospital for recurrent episodes of epistaxis, shortness of breath and abdominal fullness. The chest X-ray showed a round opacity over the left diaphragm, with congestion of the parenchyma around the hilum. The thoracic CT revealed an 18mm image in the left inferior pulmonary lobe and it accidentally revealed a hypodense image in the left hepatic lobe (Figure 1). Laboratory exams show moderate leukocytosis with eosinophilia, and normal inflammatory markers.

The patient was then referred to our clinic. The preoperative abdominal ultrasonography showed a liver with compact structure, echogenic and normal size, right lobe of 11 cm, caudate lobe of 2 cm and left lobe of 6.5cm. In the left lobe, under the diaphragm, the ultrasound revealed a round image, with well-defined borders, transonic, with laminated membranes on the inside, measuring 4.5x2.4x2.7cm, localized between segment 2 and 3 of the liver, avascular on Doppler exam. Chest X-ray revealed a cystic mass in the left inferior pulmonary lobe (Figure 2). Treatment with Albendazole and antibiotic (Ceftriaxone) was initiated before surgery.

We decided to proceed with a laparoscopic approach, inserting the optic trocar at the umbilicus (5 mm) and 3 work trocars: one in the right upper quadrant (5 mm), one in the epigastrium (5 mm) and one in the left upper quadrant (10 mm). Intraoperative, a cystic mass measuring 6x4 cm could be observed between segment 2 and segment 3 of the left hepatic lobe. Hypertonic sodium chloride was injected in the cyst 3 times and then the content was aspirated. Afterwards the cyst was incised and the laminated membrane was extracted with the help of an Endobag. The need for a partial cystectomy with sub hepatic drainage was due to the proximity between the posterior wall of the cyst and segment 2 of the left lobe of the liver. On postoperative day 4 the peritoneal drainage was removed.

Due to the small size of the pulmonary hydatid cyst, we decided not to remove it and to continue medical treatment with Albendazole. Postoperative evolution was favorable; the patient being discharged on day 5 after surgery. Follow-up ultrasonography studies showed right and left liver lobes with normal structure, no lesions, and the chest X-ray revealed the decrease of the left pulmonary opacity (Figure 3).

Discussions

Hydatidosis is a zoonosis produced by the larval stage of *Echinococcus granulosus*, its symptoms depending on the affected organ: liver (60%), lung (30%), bones or brain [2]. Most patients are asymptomatic; symptoms usually appear when the cyst ruptures. However, some may present abdominal pain in the right upper quadrant or epigastrium, nausea, vomiting, fever [6]. Hepatic hydatidosis may lead, after the rupture of the cyst, to peritoneal or biliary dissemination and anaphylactic shock [5]. Bacterial infection of the cyst can lead to hepatic abscess, cholestasis, portal hypertension or Budd-Chiari syndrome.

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Figure 1: CT exam showing a hypodense image in the left hepatic lobe.



Figure 2: Cystic mass in the left inferior pulmonary lobe.

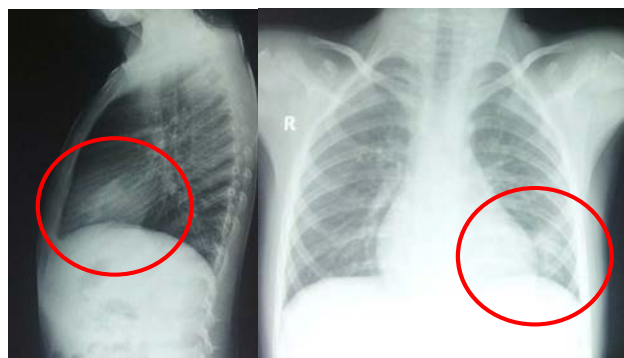


Figure 3: Chest x-ray 1 month after surgery showing a decrease of the left pulmonary opacity.

Laboratory data reveal eosinophilia, with otherwise normal blood cell counts. Positive diagnosis usually is established based on imagistic investigations (abdominal ultrasonography, abdominal CT), confirmed by serological tests: specific antibodies (90% sensitivity) [1-3].

Choosing the type of treatment depends on each case. Using only medical treatment is controversial, this option being reserved for disseminated hydatidosis or when the patient has a surgical contraindication; otherwise, treatment consists of Albendazole associated with the surgical removal of the cyst. The purpose of the surgical treatment is to excise the components of the cyst, prevent peritoneal dissemination of scolices during the intervention, and resolve the communication between the cyst and adjacent structures

and the management of the remaining cavity. Surgical treatment possibilities vary from puncture-aspiration-injection-reaspiration (PAIR) to surgical radical procedures consisting in complete removal of the cyst and hepatectomy [2,4,5].

The purpose of conservative surgery is to sterilize and evacuate the content of the cyst, including the hydatid membrane, by puncture of the cyst, followed by aspiration of the entire content and partial resection of the cyst. After the partial resection, bacterial infection may appear. The purpose of radical surgery is to ablate the entire cyst, with or without hepatectomy. However, in this case the intraoperative risks and postoperative complications are higher.

Laparoscopy was not accepted immediately or used in the treatment of hepatic hydatidosis, due to the concerns of some authors who considered that the rate of recurrence and risk of intraoperative dissemination is much higher than in open surgery [7]. However, many studies have proved that the short term recurrence rate for laparoscopic intervention is low (1-9%), compared to that of open surgery (0-30%) [8,9].

Rapid development of laparoscopic techniques encouraged adapting the procedures used during open surgery to minimally invasive approach. Minimally invasive surgery has become an advantage in the case of hydatid hepatic pathology, due to the good view over the cystic cavity, the possibility to observe and resolve a biliary fistula with the help of clips, bipolar clamp or harmonic device, allows identifying and removing the rests of the germinal membrane, therefore reducing the recurrence risk and the infectious complications [10].

Numerous laparoscopic techniques were described: complete pericystectomy (used in the case of small cysts with a superficial localization), puncture aspiration followed by marsupialization and omentoplasty, cystectomy and hepatectomy (used in case of large cysts, deep localization) [1,8].

Contraindications for laparoscopic treatment of the hydatid cyst are: rupture of the cyst in the biliary duct, cyst localized in segments 7 and 1 of the liver, cysts measuring more than 15cm, a large number of cysts or cysts with thick or calcified walls [11,12].

Postoperative morbidity associated to laparoscopy varies in the literature from 8 to 25% and includes biliary fistula, infection, fluid buildup around the liver [9], and the recurrence rate after open surgery is between 0-30%, whilst in the case of laparoscopy is 1-9% [8].

The difficulty of laparoscopic approach consists in extracting the cyst without rupturing the membranes and disseminating the cystic content, especially under the increased intraabdominal pressure induced by gas insufflation [9]. Even if the laparoscopic procedure takes longer than open surgery, postoperative recovery and hospital stay proved to be shorter in the first case [6].

Conclusions

Hydatidosis is a complex pathology, in which the treatment is chosen depending on the patient. Medical treatment is used as an adjuvant of the surgical treatment, whose purpose is to excise all the components of the cyst, preventing peritoneal dissemination. Laparoscopic approach allows a better perspective regarding the treatment of hepatic cystic pathology, permitting a good view over the cystic cavity, with the possibility of resolving an eventual biliary fistula, reducing the rate of complications and recurrence.

Conflict of interests

Authors have no conflict of interest to disclose.

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