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IPOM with Dual Mesh and Fibrin Glue *vs.* TAPP Review of Literature

Syed Hussain*

Department of Surgery, Surgery Royal Commission Medical Center, Yanbu Al Sinayah, Saudi Arabia

Abstract

The authors based on the analysis of literature reports have concluded that the danger of intraabdominal complications after IPOM is exaggerated. Tension-free intraperitoneal plasty with synthetic endoprostheses in abdominal wall hernias is a simple and reliable surgical approach. The results of studies as well as the meta-analysis of the series presented in the Literature, indicate that the IPOM may be a feasible, safe and effective procedure in the treatment of recurrent and bilateral hernias or when a hernia repair is performed during other laparoscopic procedures. The IPOM has in fact been shown to be faster and easier than the other more commonly performed laparoscopic hernioplasties (TAPP and TEP). This data may also suggest utilizing this technique in particular cases of primitive hernia such as very active young males or heavy duty workers. However the limited series and the short follow-up ask for randomized prospective long term studies to definitely ascertain the true incidence of recurrence and therefore the effectiveness of this attractive procedure.

Keywords: Laparoscopic inguinal hernia repair • Hernioplasty • Inguinal hernia • Laparoscopic *vs.* open inguinal hernia repair

Introduction

Repair of inguinal hernia is one of the commonest surgical procedures worldwide. Irrespective of The problem of abdominal wall repair is unsolved till now. The collagenopathy and changes of abdominal wall function are in basis of hernia formation. Over hundreds of surgical procedures, synthetic materials and methods of their implantation have been offered so far, however we have no ideal solution. The tension- free plasty with synthetic mesh ranks first in hernia repair that has significantly improved the results and reduced the recurrence rate. The use of mesh is recommended both in scheduled surgery and in emergency. The implantation of synthetic endoprosthesis is considered possible and useful in some cases of peritonitis and eventration. This approach is proved pathogenically, because the tension-free technique is helpful in solving the problem of abdominal compartment syndrome. This type of surgery is recommended as a method of choice in strangulated hernia repair, which significantly reduces the incidence of complications and mortality. Long-term results are generally assessed by analysis of quality of life indicator. In this regard the advantages of tension- free technique are proved.

However, as far as experience in abdominal wall plasty with mesh use has been gained, the delight in the results of the first operations has gone. New problems have arisen and surgeons discuss them not as enthusiastically as before. The implantation of mesh was found to give no assurances of recurrence absence.

There are experimental data on male infertility after mesh inguinal plasty were received. Clinical results are different, but some studies confirm grave reservations concerning the problem.

The mesh-associated chronic pain, foreign body sensation and stiff-man syndrome were described. The data on testicular atrophy and ejaculatory dysfunction was published. Mesh shrinkage effect (4–50%) that results in recurrence has not been corrected so far. The impact of mesh material and its fixation method on a phenomenon of shrinkage and dislocation is not clear and actively studied currently. It is proved that the morphological patterns of reparative process are common for many types of operations and materials. The reparative process includes aseptic inflammation after mesh implantation, angiogenesis, connective tissue formation (first — young tissue and then — mature). However, in some cases the inflammation after reparative process termination persists. It is not improbable that chronic inflammatory in implantation zone forms the basis of most problem. Probably, this is precisely why chronic pain syndrome and foreign body sensation are observed after both open repair and endoscopic surgery.

The results of treatment depend on clinical experience, endoprosthesis used, type of plasty chosen, as well as appropriate complication prevention. The impact of mesh material or operative method on life quality indicators are the subject of close attention of physicians. IPOM (intraperitoneal onlay mesh) is a tension-free method of abdominal wall repair, which includes an access to the abdominal cavity (endoscopic or open), intraperitoneal mesh placement with complete overlap of the existing defect. The simplicity of the first stage performance, reliability and easy learning to use the technique is the characteristic of IPOM.

Recent studies clearly demonstrated that the use of this method is associated with lower pain syndrome than TAPP and required minimal operation time. There is no contact between an implant and spermatic cord that gives hope for a positive result regarding fertility. The downside of IPOM is the risk of adhesions formation in the abdominal cavity and other intraabdominal complications. However, on the other hand, such problems are nonspecific and also found in other techniques of the inguinal canal reconstruction. Wider adoption of IPOM became possible after the development of composite implants with anti-adhesive properties of their visceral surface. The use of special fixation methods (sutureless technique, the use of glue) significantly expanded the possibilities of this technology.

Operative Details

The patient requires a General Anesthetic, with muscle relaxation. It can be done with an epidural or spinal anesthetic, but needs sedation as well; the view is difficult and there is often spontaneous movement. The operating position is supine, with some head-down tilt, to move viscera out of the pelvis.

***Address for Correspondence:** Syed Hussain, Department of Surgery, Surgery Royal Commission Medical Center, Yanbu Al Sinayah, Saudi Arabia; Tel: +91 9667126862; E-mail: syedhussain91@hotmail.com*

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Primary access (and endoscope position) is immediately below the umbilicus, with an operating port on either side. A 30 degree optic makes the view much better. A horizontal peritoneal flap is mobilized down at the level of the anterior superior iliac spine. The space must be made large enough to accommodate the polypropylene mesh, allowing it to lie completely flat – not doing this adequately is a common error. The mesh must be large enough to cover all of the myopectineal orofice of Fruchaud, with an overlap of at least 2 cm from the margin of the hernia defect(s) in all directions. The mesh is stapled to Cooper's ligament, with a few staples medially on the rectus abdominis and superiorly as far as the inferior epigastric artery. None must be placed laterally. Large hernias in obese men are best not treated laparoscopically. The view and dissection are difficult and postoperative haematoma is more likely.

Key questions

1. What is the recurrence rate for the laparoscopic procedure and how does it compare with other methods? This is the single most important question for the patient!
2. How rapid is the patient's recovery and return to normal activities?
3. What is the incidence of long-term operation-related symptoms?
4. What about the "economics"? These can be considered in terms of:
    - Operating time – the use of available facilities.
    - Cost of disposables and other materials.
    - Time in hospital and the suitability for day-case facilities.
    - Time off work and "normal activities".

Some of these questions are hard to answer from the literature. Very little exists to demonstrate clearly the value of laparoscopic hernia repair as an established procedure. Large numbers of repairs in a homogeneous series allow some conclusions to be drawn on a "res ipsa loquitur" basis – the facts speak for themselves. The most obvious example is the work of Bittner's unit in Stuttgart.

Many thousands of patients have been treated, with impressive outcomes, but we do not have access to his data base!

The Stafford study

TAPP hernia repair was started in Stafford in April 1992 and to date, 1,873 have been done, by a single surgeon. 78% were treated within the same day. The demographic data and operative details (including anatomy, mesh size and operating time) were recorded prospectively. Two cohorts of patients have been studied. In the first, 629 hernias from the very beginning were followed up after 1-9 years (mean 56 months). Series 2 was 945 hernias, with a mean follow-up of 43.8 months. The patients were all sent a postal questionnaire, with three simple questions.

- Have you had any further problems from your hernia operation?
- Do you still get any pain or discomfort?
- Is there anything else you would like to say?

Any adverse or unclear comments were pursued by telephone and, if still unclear, by a clinic visit. There was a very good response rate – achieving complete data in 92.7% for series 1 and 75.9% in series 2. The hospital is the only one for its catchment population.

Results

All these patients had TAPP repairs, almost all of them by closed entry with a Verres needle. There were no visceral or vascular entry injuries and no conversions to open operation. The operating time was defined as from first incision to last stitch. It clearly shows a Learning Curve of about 70 patients. This was quite shallow, but it needs to be remembered that the surgeon already had considerable laparoscopic expertise, including 85 cholecystectomies. The time/case curve for Series 2 was flat, as expected and is not included. For the patient, a hernia recurrence is the biggest disappointment. Hernias recurred in 10 (1.58%) patients in the initial series. Within the first 32 patients on the Learning Curve there were 6 (19%) recurrences. Although disappointingly high, at this stage the technique and instruments were still developing. These factors were soon resolved and early results for new learners should now be better. Once operative time had stabilized only 4 (0.9%) suffered a recurrence in the rest of the series. Ongoing symptoms, particularly pain are the next important criterion of success. In our series 3.3%) patients reported "pain." None was severe enough to affect activities of daily living. A further 16 (2.3%) reported "discomfort." Most patients reported no problems at all. A very interesting observation concerned "extra hernias". These were found surprisingly frequently. They are usually evident immediately the laparoscope is inserted. In patients with a clinical diagnosis of unilateral hernia 28.7% had a contralateral defect. 80 femoral hernias and 1 obturator hernia were also found at operation. They were all repaired at the time of discovery.

Discussion

They were all repaired at the time of discovery. The four domains above (Time, Recurrence, Discomfort and Extra Hernias) will be examined in the light of other reports. It is generally agreed that sutured hernia repair is no longer a realistic option for elective hernia surgery because of recurrence and long-term symptoms. It will not be further considered here.

Recurrence

This is the principal criterion of failure in hernia repair. The strong evidence is that tension-free mesh repair of some sort offers the best results [1]. Logic favours the placement of the mesh preperitoneally, where the intraabdominal pressure holds it in place. When inserted anteriorly the tendency is for this pressure to push it off, particularly medially, where there is no support from the external oblique aponeurosis. Does this make any difference in practice and if so, is this maintained in the long term?

The Lichtenstein repair has been with us for over 20 years, laparoscopy for only 15. Both should now have long term results but there are very few quality data available. Most of the comparative trials have only short-term results – about three years, at best. The quoted recurrence varies widely in those available. Published papers from before the late 1990s tend to have multiple authors, many of whom had only performed small numbers of laparoscopic repairs at the time of reporting.

They were mainly on their learning curve, in a still developing technique, many details of which had not been adequately assessed or standardized. Lichtenstein repair had already become generally accepted and conflicting. Even so, the results of laparoscopy were quoted as "at least as good" with similar recurrence figures. The Lichtenstein results being achieved generally are not as good as those originally described by their authors. In 1989 his group was achieving 0.2% recurrence. Later papers showed up to 8% across all surgeons using this technique [2]. At that time, laparoscopy was already showing as low as 1%, but these were early results. What can be achieved with an established procedure over a longer period of time? The Stafford study shows a considerable improvement 0.7% following the learning curve in a large single surgeon series [3,4]. These are medium to long-term results for a large, homogeneous group of patients and are very similar to those of Bittner (0.4% all grades and training), the largest series in the World [5-12].

Conclusion

By all criteria of success – recurrence, recovery, long-term symptoms and economics – laparoscopic inguinal hernia repair is the winner. So why is it not done much more widely? Although many randomized controlled trials showed probable advantages, these were not compelling.

This was largely due to the inadequacy of the studies, but some people (and Health Authorities) (NICE have extrapolated these data to reject laparoscopy, except for recurrent and bilateral hernias. The rationale has not been on clinical grounds, but on false economic ones.

There has been some relaxation of this with time, but the initial negativity has not been replaced by a resurgence of activity. Why? Many surgeons see the immediate problems of a new learning curve in their otherwise-established career. Training and mentoring can help. Some people have started with TEP and found unaccustomed anatomy in a confined space problematical. Starting with TAPP is a wiser move. The technique can be changed later, if desired.

1. The facts remain, that in patient terms, laparoscopy gives the best overall results of any hernia repair method. It deserves wider acceptance and practice. What steps are needed?
2. This is not an operation for beginners. Experience in other procedures such as cholecystectomy should be the starting point. A policy decision is needed by surgeons and hospital managers. A new procedure needs time and funding for training and initial experience.
3. Formal external training and on-site mentoring will establish good practice from the beginning. It should avoid problems and accelerate progress.
4. Laparoscopic hernia surgeons need an adequate number of patients to develop and maintain expertise. This is not a procedure for the occasional operator.
5. Prospective audit will indicate the state of progress and any need for corrective action. It needs to be said that most surgeons do not know their results, because they do not look. This includes those for open hernia repair! Doing so will yield much better data for future true comparisons. Inevitably larger objective information will lead to better patient care. Intraperitoneal plasty of abdominal wall with synthetic mesh use is a simply and reliable method in hernia repair. The risk of complication after IPOM should be considered exaggerated. The development and implementation of composite meshes with different properties of surfaces is necessary now.

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