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Laparoscopic Treatment for Lipoma in the Inguinal Canal without Hernia: Intracorporeal Lipoma Excision and Suture Repair of the Deep Inguinal Ring

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Abstract

Background: The clinical symptoms of inguinal lipoma (IL) are similar to those of inguinal hernia (IH). As for IH, the treatment for symptomatic IL includes surgery. This study aimed to evaluate the outcomes of laparoscopic excision of IL with suture repair of the deep inguinal ring.

Methods: The cohort of this retrospective study included 46 adult patients with IL who visited Damsoyu hospital from September 2012 to December 2016. During the same period, 1,100 patients with inguinal hernia were treated. IL was completely excised, and the deep inguinal ring was repaired with intracorporeal sutures.

Results: IL without IH was observed in 35 males and 11 females and symptoms of inguinal bulging with pain in 26 (74.3%) males and 10 (90.9%) females. IL was located in the indirect inguinal canal in 32 (91.4%) males and 7 (63.6%) females. It was separated from the preperitoneal fat in 21 (60%) males and 6 (54.5%) females.

Conclusion: When treating a groin mass in the absence of IH, IL should be suspected. Laparoscopic excision of IL and the suturing of the deep inguinal ring as posterior wall repair had a shorter surgical duration and acceptable recurrence and complication rates.

Keywords: Inguinal lipoma; Inguinal hernia; Laparoscopy; Inguinal mass; Inguinal swelling

Introduction

The most common symptom of inguinal lipoma (IL) is bulging, which is also observed with inguinal hernia (IH). IL is classified into two types: true IL separated from the preperitoneal fat [1] and IL in which the preperitoneal fat is projected into the internal inguinal canal [2]. At present, the recommended treatment for IL associated with hernia is excision to reduce the risk of hernia recurrence [3]. The treatment guidelines for IL associated with hernia include lipoma excision and posterior wall repair. However, few studies have reported the treatment options for IL without hernia. Therefore, the aim of the present study was to investigate the efficacy and outcomes of laparoscopic excision with suture repair of the deep inguinal ring for the treatment of IL without IH.

Case Study

This retrospective study evaluated the outcomes of laparoscopic IL resections performed at Damsoyu Hospital (Seoul, Republic of Korea) between September 2012 and December 2016. All patients underwent surgery after the procedure was described to them and their informed consent was obtained. The study cohort included 46 patients with IL, which was not associated with IH; those with IH were excluded. All patients were identified by diagnosis codes. Ultrasonography was performed for preoperative diagnosis (Figure 1). In all patients, the processus vaginalis and canal of Nuck were closed, regardless of whether the IL was connected to the preperitoneal fat. The clinical variables, including demographic characteristics, operative findings, and outcomes, were retrospectively collected from medical records. Male and female patients were divided into two groups. The study protocol was approved by the Institutional Review Board of Damsoyu Hospital (DSY-2017-007).

Laparoscopic procedure

All patients underwent a laparoscopic operation under general anesthesia in the supine position using a 5.0-mm 30° rigid camera and 5.0-mm rigid instruments. A transumbilical 5.0-mm incision was used to create a pneumoperitoneum via a 5.0-mm trocar. CO_2 pneumoperitoneum was maintained at 8-12 mmHg. Two other 5.0-mm instruments were inserted through separate 5.0-mm stab incisions in the lateral abdomen.

After the inspection of the internal inguinal ring, the processus vaginalis and canal of Nuck were closed. The external compression of

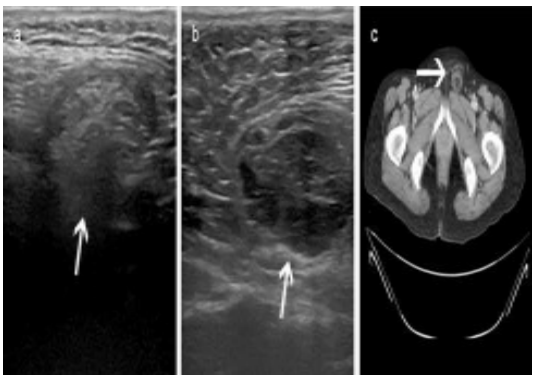

Figure 1: Sonography and computed tomography (CT) findings in patients with inguinal lipoma (IL). (A) Sonographic finding of inguinal hernia (IH) containing the greater omentum (arrow). A hyperechoic round lesion is seen in the inguinal canal. (B) Sonographic finding of the IL (arrow). A hypoechoic round lesion is seen in the inguinal canal. (C) CT finding of the IL (arrow). A round independent lesion is seen in the inguinal canal.

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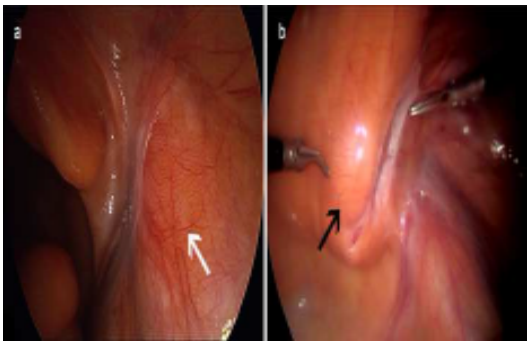

Figure 2: Laparoscopic view of the deep inguinal ring. (A) Bulging of an indirect area (white arrow) without a hernia sac. (B) Bulging of a direct area (black arrow) without a hernia sac.

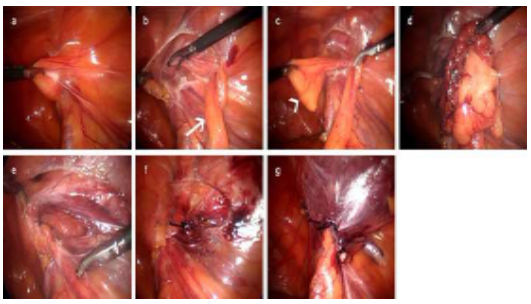

Figure 3: Surgical procedure. (A) Closed processus vaginalis. (B) First dissection of an inguinal lipoma (IL; arrow) connected to preperitoneal fat. The deep inguinal ring was observable after IL dissection. (C) Second dissection of the IL (arrowhead) separated from the preperitoneal fat. (D) Full excision of the IL. (E) The deep inguinal ring after complete IL excision. (F) Suture repair of the deep inguinal ring. (G) Peritoneum closure with continuous sutures.

the inguinal area revealed a peritoneum protruding into the abdominal cavity (Figure 2). An incision of the peritoneum was performed using a dissector to confirm IL. After complete IL excision, the deep inguinal ring was closed using sutures with a nonabsorbable multifilament (silk 1-0). The technical details of the suture are as follows: initially, sutures were placed while avoiding the cord vessel and vas deferens and tied at the bottom of the defect wall. Next, they were sutured in the upward direction until the top of the defect wall, then continuously sutured in the opposite direction and intracorporeally tied at the initial knot (Figure 3). The peritoneum was closed with continuous absorbable sutures (Vicryl 1-0).

Follow-up protocols

Eating and drinking were permitted after a 2-h observation period. In accordance with the protocol of the institution, the patient was discharged once comfortable with daily activities, such as walking and eating. Telephone interviews were conducted on day 2 to check the postoperative status, such as pain, wound state, possible symptoms of hematoma, and seroma. The outpatient follow-up routine included physical examination at 7 days and 6 months and annual telephone follow-ups thereafter. The telephone follow-ups in this study were conducted until June 2017. The mean follow-up period was 26.2 ± 15.7 (range, 6-57) months for males and 28.8 ± 16.4 (8-55) months for females.

Statistical analysis

All statistical analyses were performed using R 3.3.2 software (R Development Core Team, Vienna, Austria). Continuous variables are presented as mean ± standard deviation and categorical variables as frequency and percentage. The Shapiro–Wilk test was used to assess the normality of continuous variables. Continuous variables were analyzed using the t-test or Wilcoxon rank sum test, whereas categorical variables were analyzed using the Fisher's exact test or $\chi 2$ test. A probability (p) value of ≤ 0.05 was considered statistically significant.

Results

Patient characteristics are shown in Table 1. There was no conversion to open surgery and no difference in age between males and females, although the body mass index was higher in males than in females (24.8 ± 3.06 (19.5-33.7) kg/m^2 vs. 21.7 ± 2.33 (18.1-25.0) kg/m^2, p=0.004). The laterality of the IL was more common on the right side in both sexes, but there was no significant difference between sexes. Inguinal pain was more frequent in female than in male patients (90.9% vs. 74.3%), but this difference was not statistically significant. The location of the IL tended to be in an indirect area more commonly in male than in female patients (91.4% vs. 63.6%, p=0.046). IL was separated with preperitoneal fat in 21 (60%) males and 6 (54.5%) females (Figure 4). The mean surgical duration was approximately 31 min, with no significant difference between males and females. The mean postoperative hospital stay was also similar between males and females, with no significant difference in complication rates between groups (one IH in one male patient). After conservative treatment, the IH subsided with no recurrence to date.

Discussion

IL primarily manifests as an inguinal bulge with symptoms similar to those of IH. The prevalence of IL was reportedly 75% among male autopsy cases, although the symptoms were not confirmed [4]. In the present study, hyperechoic lesions were observed in the inguinal canal of the hernia protruding from the greater omentum. Although IH was

Variables	Male (n=35)	Female (n=11)	p-value*
Age (years, range)	48.7 ± 13.9 (19-76)	50.5 ± 13.2 (34-70)	0.706
BMI (kg/m^2, range)	24.8 ± 3.06 (19.5-33.7)	21.7 ± 2.33 (18.1-25.0)	0.004
Laterality			
Right	19 (54.3%)	7 (63.6%)	0.430
Left	10 (28.6%)	4 (36.4%)	
Both	6 (17.1%)	0 (0.0%)	
Symptom			
Inguinal bulging only	9 (25.7%)	1 (9.1%)	0.410
Bulging with pain	26 (74.3%)	10 (90.9%)	
Location of lipoma			
Indirect	32 (91.4%)	7 (63.6%)	0.046
Direct	3 (8.6%)	4 (36.4%)	
Connection to preperitoneal fat			
Yes	14 (40.0%)	5 (45.5%)	1
No	21 (60.0%)	6 (54.5%)	-
Surgical duration (minutes)	31.2 ± 11.8 (15-60)	31.4 ± 12.9 (17-55)	0.915
Hospital stay (hour)	12.1 ±15.5 (3.33-67.6)	12.9 ± 12.9 (3.83-40.7)	0.321
Complication			
Seroma	0	0	1
Hematoma	1 (2.9%)	0	-
Follow-up period (months)	26.2 ± 15.7 (6-57)	28.8 ± 16.4 (8-55)	0.595

*Categorical variables were analyzed using the χ^2 test or Fisher's exact test. Continuous variables were analyzed using the independent samples *t*-test.

Table 1: Patient characteristics.

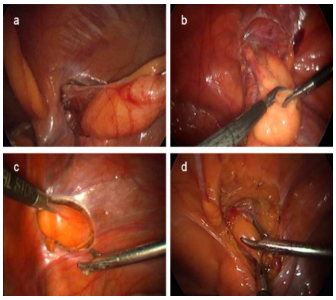

Figure 4: Multiple characteristics of inguinal lipoma (IL). (A) IL connected to preperitoneal fat in an indirect area in a male patient. (B) IL separated from the preperitoneal fat at an indirect area in a male patient. (C) IL separated from the preperitoneal fat at an indirect area in a female patient. (D) IL separated from the preperitoneal fat at a direct area in a female patient.

preoperatively diagnosed, the external compression of the inguinal area with bulging of the IL was laparoscopically confirmed [5]. A misdiagnosis of IL can lead to IH recurrence and IL enlargement; thus, current recommendations include the removal of IL with or without an associated IH [3,6]. Fatty tissues occupying the preperitoneal space can give rise to symptoms. One author described "true" IL as the one not connected to extraperitoneal fat and confined to the inguinal canal [1], while another described it as preperitoneal fat that projects through the internal inguinal ring [2]. In this study, IL was defined as a protrusion of preperitoneal fat or its separation from the retroperitoneal tissues. In this study, 21 males and 6 females had an IL separated from the preperitoneal fat. All ILs with direct defects were separated from the preperitoneal fat. The prevalence of IL not associated with IH, reported in previous studies, was greater than that in the present study (13%-16% vs. 4.2%) [7,8]. In this study, the primary symptom in all patients was a round movable inguinal mass, and 26 (74.3%) males and 10 (90.9%) females complained of pain. The incidence of pain in the present study was similar to that in previous reports (78% vs. 77%) [7].

IL is difficult to distinguish from IH through physical examination. Preoperative ultrasonography showed a round movable mass composed of dense fat similar to a herniated omentum. Pelvic computed tomography (CT) is reportedly useful to accurately diagnose IL. However, as a drawback, pelvic CT is not applicable to all patients due to cost concerns [9]. In this study, one female patient was diagnosed with preoperative IL by pelvic CT (Figure 1), IL was confirmed in 63% (29/46) of cases by preoperative sonography, and 35% (16/46) cases were indistinguishable from those of IH. In a previous report, 55% of cases were preoperatively diagnosed by pelvic CT [7].

IL is often found during IH surgery. Both open and laparoscopic surgeries have been applied for herniorrhaphy [8,10]. Most surgeons agree that IL is not accompanied by IH, but its treatment is based on that of IH [11]. Therefore, we agree that posterior wall repair should be performed after IL resection. The current trend in surgical treatment is to ensure minimal invasiveness and avoid recurrence. As IL occupies the inguinal canal even when not accompanied by IH, it may appear as an IH defect with no sac. Therefore, posterior wall repair must be performed. Posterior wall repair using laparoscopic surgery with mesh implantation and tissue repair and mesh implantation using open surgery have been reported. However, tissue repair by laparoscopic surgery has not been reported. The posterior wall repair method used in this study was the same as Marcy repair in open surgery. In this cohort, there has been no IL recurrence or IH development to date.

As a limitation, this was a retrospective study conducted at a single center. In addition, no comparison was made with open surgeries. Laparoscopic excision was not difficult because the IL was located in the direct IH defect or deep inguinal ring. Furthermore, the follow-up period was relatively short; thus, longer follow-up terms are required to obtain the IL recurrence or IH occurrence rates.

Conclusion

In conclusion, when a patient presents with a symptom of an inguinal bulge, the possibility of IL should be considered. In this study, 46 IL patients without IH were successfully treated using laparoscopy by complete IL excision and intracorporeal suturing of the deep inguinal ring as posterior wall repair.

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