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Methods for umblical hernia repair when combined with laparoscopic cholecystectomy

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Abstract
Introduction: Umblical hernia repair can be combined with laparoscopic cholecystectomy (LC) session which provides opportunity to get single anesthesia exposure, single hospital stay with minimum loss of working days.
Aim: We have aimed to determine the optimal repair method for small umbilical hernias during LC and investigated the safety and the efficiency of these combined operations.
Methods: We have analyzed the LC cases in our surgical department who underwent LC and primary umblical hernia repair together retrospectively in three years period. Patients' demographic data, operation time, mesh application time, hospital stay, complications, surgical technique were analyzed in the database. Patients were assigned to two groups. If the patients BMI was less than 30 kg/m^2, primary suturing was performed seperately using 1/0 prolene. If the patients BMI was greater than 30 kg/m^2, a 5cm diameter flat, self gripping prolene patch mesh was inserted. After 24 months, patients were reexamined for recurrency with clinical examination. If there was doubt, ultrasonography was applied for detection of the recurrency.
Results: During 3 years period 1762 LCs were performed. 120 of these cases underwent combined surgery.(6.8%). There were 77 male and 43 female patient. Group 1 consist of 92 patients and Group 2 consist of 28 patients. The mean hospital stay was 2 days (range 1-4 days) for both groups (2±1.1 days for Group1 and 2± 1.4 days for Group2). The mean operation time was 56 min (range 32-125 min). After taking the specimen, the time of surgery for hernia repair was approximately 8 minutes (6-22) in Group 1, whereas it was about 10 minutes (6-30) in Group 2. During the follow up after 2 years period, in Group 1; 78 patients were eligible and there were 4 (5.1%) recurrencies in this group. In Group 2; 26 patients were eligible and there was 1 case of recurrency (3.8%).
Conclusion: Watchful waiting can be considered safe for patients with small asymptomatic umbilical hernias. If LC is planned for conditions like symptomatic cholelithiasis,combined umblical hernia repair in the same operation provides extra benefit. Patients demographics especially like BMI is an important factor deciding the repair method of the small umblical hernias. If BMI is low, sutured repair can be choosen over mesh repair or vice versa. Tailored surgery is needed even in small asymptomatic umblical hernias in combined procedures.

Keywords: combined surgery, self gripping, mesh, tailored surgery

Introduction

Umbilical defects may cause technical problems for general surgeons during laparoscopic cholecystectomy (LC) and may increase the incidence of incisional hernia [1]. 6% of all abdominal hernias in adults are umblical hernias [2]. There was no consensus on the best surgical approach for umblical hernia repair for a long time. There has been guidelines for ventral hernias for a long time but no specific guideline has been published on the treatment of umbilical hernias, specifically addressing both open and laparoscopic techniques [3-12], until the recent Guideline from the European Hernia Society (EHS) and Americas Hernia Society (AHS) [13].

Muhe performed the first laparoscopic cholecystectomy in 1985[14] and today lots of procedures are performed laparoscopically with multiple advantages [15]. Using combined techniques have proved equally safe and efficacious results with the operations performed singularly while it is more beneficial for the patient in terms of getting single exposure to anesthesia, single hospital stay with minimum loss of working days. Although open umbilical hernioplasty by primary closure of the fascial defects is considered the standard repair by most surgeons, high recurrence rate can be seen after primary suture repair (11%)[16]. Prevalence of cholelithiasis accompanied by umbilical hernia varies between 4.7-18%[14-17] but there are limited number of studies that have reported outcomes of umblical hernia repair performed simultaneously with LC in the same session.

In this study we searched the optimal repair method for umbilical hernias during LC and aimed to evaluate the safety and efficiency of the surgical techniques spesific to this condition.

Methods

We accessed our hospital database in order to determine the population of this retrospective study and analyzed the LC cases at our surgical department who underwent LC and primary umblical hernia repair together between January 2015 to January 2018. Operations due to malignancy, ascites, recurrent hernia, emergent cases and patients with hernia defect over 1 cm diameter are excluded.

Patients' demographic data, operation time, mesh application

time, hospital stay, complications, surgical technique were evaluated in the database. Patients were assigned into two groups:
1. LC+ primary repair group (Group 1)
2. LC+ mesh repair group (Group 2)

All patients received elective operations under general anesthesia. The choice of the operative technique depended on patients' body mass index (BMI).

Surgical Methods

An incision at the level of the hernia had performed under general anesthesia. After entering the hernia sac, an open Hasson Trocar is inserted to prevent visceral injury beyond hernia sac. After LC and removing the specimen, umblical hernia was repaired. If the hernia size was less than 1 cm and patients BMI was less than 30 kg/m^2, primary suturing was performed seperately using 1/0 prolene. If the patients BMI was greater than 30 kg/m^2 a 5cm diameter flat, self gripping prolene patch mesh was inserted.

Fig 1

All eligible patients for the study were reexamined in order to get accurate and updated data about their physical status and recurrency after 24 months. A protrusion in the incision was considered to be a hernia, ultrasonography (USG) was applied in any case of doubt.

Results

We performed 1762 LCs in our clinic between January 2015 to January 2018. We performed combined surgery technique in 120 of the cases (6.8%). The gender distribution was; 77 male and 43 female. In LC+ primary repair group (Group 1) there were 92 patients while LC+ mesh repair group (Group 2) consisted of 28 patients.

The mean hospital stay was 2 days (range 1-4 days) for both groups (2±1.1 days for Group1 and 2± 1.4 days for Group2). There was no statistically significance between the two groups.

The mean operation time was 56 min (range 32-125 min). After taking the specimen, the time of surgery for hernia repair was approximately 8 minutes (6-22) in Group 1, whereas it was about 10 minutes (6-30) in Group 2.

During early postoperative follow-up examinations; there were 4 (4.3%) wound morbidities in Group 1. All wound morbidities were superficial wound infections. All of them were resolved with antibiotics but one wound morbidity needed drainage. There was no seroma and hematoma in Group1. No post-operative mortality was observed in this group.

In Group 2 there were 3 (10.7%) wound morbidities observed in the post-operative follow-up visit. Two patient had superficial wound infections that resolved with antibiotics and no drainage was needed. One patient (3.5%) had persistant seroma that lasted over 6 months and no hematoma was observed. Also no mortality was occcured in this group, too.

At the end of the two years extension follow-up period; we have recalled 78 patients in Group1 and called for physical examination. There were 4 (5.1%) recurrent cases in this group. In Group 2 we have recalled 26 patient and there were 1 recurrent case (3.8%) after the two years extension follow-up period. All the recurrences were detected by clinical examination except one patient in Group2. That patient had morbid obesity and it was not possible to perform an accurate physical examination because of exessive amount of abdominal fat tissue. She had pain at the incision zone and there was uncertainity for the recurrency at clinical examinaton. We have applied USG imaging for the patient and detected recurrent umblical hernia.

Discussion

In 5-18% of all laparoscopic cholecystectomies simultaneous umbilical hernia repair is the suitable choice. The publications evaluating the results of these combined procedures are not sufficient in quantity and there are confusing results forythis type of combined surgery [1, 17-19]. In our serie 6.8% patients were in combined surgery group.

There is no available satisfactory classification depending on the sizes of umbilical hernias. It is better to define umbilical hernias based on defect diameter such as smalls, medium and large.

Small hernia defects include 0-1 cm diameter hernias while medium ones are more than 1cm upto 4cm and large hernias more than 4 cm in diameter[13]. In our study we have evaluated the results of small umblical hernias operated with combined procedures because medium and large hernias may require special approach in terms of laparoscopic techniques and repair methods.

Umbilical hernias can be diagnosed by clinical examination only. Imaging methods such as USG and computed tomography scans can be considered if clinical examination is ambigous [13, 20-22]. Although the patients had USG for cholelithiasis, no extra imaging method for umblical hernia detection was needed in our serie and we had diagnosed umblical hernias 100% success rate by inserting the Hasson trocar at the umblicus as umbilical hernias present in the centre of the umbilical ring.

Watchful waiting seems safe and can be suggested for patients with asymptomatic umbilical hernias but it lacks of sufficient scientific data [13, 23, 24]. The main goal of the operation in our series was symptomatic cholelithiasis and umblical hernia repair has been the extra benefit for the patients in terms of combined procedure.

For primary umblical hernia operations, obesity is reported to be an independent recurrence risk in the studies [25, 26]. We have designed the study based on BMI; if BMI < 30 kg/m^2 then sutured repair was performed, if BMI was > 30 kg/m^2 then mesh repair was preffered to avoid recurrence.

The majority of umbilical hernias are small or medium in size and an open repair with mesh reduces the recurrence rate without increasing complications. But the data is limited for small defects between 0–1cm [13, 27]. Open mesh repair or sutured repair may be considered based on patient characteristics and in shared decision-making with the patient[13]. In our combined procedure we used mesh repair in obese patients and suture repair in patients with BMI < 30.

Sutured repair can be considered as a tailored surgery for small hernia defects less than 1cm [28-31]. Slowly resorbable or non-absorbable sutures for sutured repair of umbilical hernias is suggested as the best option [13]. In our serie we used 1/0 seperate prolene sutures in umblical hernia repairs.

There are several publications that suggest mesh is also beneficial for small defects but evidence is limited for hernia defects smaller than 1cm [27]. It is suggested to place permanent mesh in preperitoneal space for open umbilical hernia repair. There is acceptable published data about repairing umblical hernias safely using a synthetic polypropylene mesh [26, 28, 32-34]. We have used flat mesh patches for the repair.

There is not enough scientific data favoring any method of fixation over another or whether mesh fixation is even necessary in open umbilical hernia repair[13]. Suture fixation with non-absorbable sutures is described in most of the literatures [32, 35]. We had used self-gripping mesh in our serie with no extra fixation. This provided painless and quick fixation without any migration of the mesh.

Sutured umbilical hernia repair reccurence rates vary between 1% and 54,5%, depending on the follow-up method regardless of diameter [28, 30-36]. A large cohort study publication with 1313 cases having a suture or mesh repair of an umbilical or epigastric hernia with a defect < 2cm reported an overall recurrence of 14% [31]. After 2 years period, our suture repair recurrency rate was (5.1%) and mesh repair recurrency rate was 3.8%. Altough there is a gap for the recurrence rates for hernias smaller than 1cm, our recurrence rates is low compared to the literature.

Conclusion

Watchful waiting can be considered safe for patients with small asymptomatic umbilical hernias. If LC is planned for conditions like symptomatic cholelithiasis,combined umblical hernia repair in the same operation provides extra benefit. Repair method of the small umblical hernias can be choosen by patients demographics; especially BMI. Sutured repair can be performed if BMI < 30 kg/m^2 and mesh repair can be performed to avoid recurrence if BMI > 30 kg/m^2. Tailored surgery is needed even in small asymptomatic umblical hernias in these combined procedures.

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