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THE INCIDENCE AND THE PRESENTATION OF PORT SITE HERNIA AFTER LAPAROSCOPIC CHOLECYSTECTOMY

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ABSTRACT

Background: Laparoscopic cholecystectomy (LC) has revolutionized intra-abdominal surgery and became the gold standard surgical treatment for gallstone disease, but is associated with specific complications as port site hernia (PSH). PSH is uncommon but can present as an asymptomatic swelling or with potentially dangerous complications. ***The aim of this study***: Is to determine the incidence of PSH and its presentation in patients underwent LC as it is the most common laparoscopic surgery performed in our institute. **Patients and Method:** This prospective study was done in the Laparoscopy Unit- Department of General Surgery- Baquba Teaching Hospital – Diyala – Iraq, from January 2017 to June 2020. A total of 467 patients in whom successful LC was done for gallstone diseases, were included and followed up for at least one year. **Result:** Of the 467 patients, who were included, 85.87% were female and 14.13% were male. Patients' age ranged from 10 years to 77 years with a mean age of 42 years. During the follow up peroid, five patients (1.07%) had PSH; four patients with a hernia at the site of the umbilical port and one with a hernia at the site of the epigastric port. The period between the LC and the diagnosis of PSH ranged from 3 months to 15 months, one patient presented as an emergency case of strangulated hernia at the site of the umbilical port, while the other four patients presented as elective cases. **Conclusion:** PSH is an uncommon but an important dangerous complication of minimal invasive procedures, that requires long – term follow up. Knowing of the risk factors and taking the preventive measures by the laparoscopic surgeons are important to reduce its incidence.

KEYWORDS: Port site hernia, incisional hernia, laparoscopic cholecystectomy, laparoscopy complications.

INTRODUCTION

Laparoscopic cholecystectomy (LC) has revolutionized intra-abdominal surgery and became the gold standard surgical treatment for gallstone disease.[1-6] Minimal invasive procedures as LC offer several advantages over laparotomy[5,7] but are associated with specific complications as port site hernia.[1,3,8,9]

Port site hernia (PSH), also known as port site incisional hernia or trocar site hernia, is defined as the development of a hernia at the trocar insertion site after laparoscopic surgery.[9-12] PSH incidence is uncommon.[1] but it is undesirably rising due to the increase in the number of laparoscopic procedures performed worldwide.[13,14]

PSH can present as an asymptomatic port site swelling or with potentially dangerous complications like bowel obstruction with considerable morbidity and mortality requiring surgical intervention.[1,7,8,11-17] The diagnosis is clinical, but imaging tests as abdominal ultrasonography and abdominal CT can improve the diagnostic accuracy.[18,19] The interval between the operation and diagnosis of PSH varies between studies and depends on the follow up regimes.[7,14, 20]

Hitoshi Tonouchi et al[21] classified PSH in to three types. Early onset type in which there is dehiscence of anterior fascial plane, posterior fascial plane and peritoneum. The late onset type which develops several months after surgery and in this type there is dehiscence of the anterior fascial plane and posterior fascial plane. The hernial sac of late onset type is the peritoneum. The special type indicates dehiscence of the whole abdominal

wall. Protrusion of the intestine and other tissues as omentum is recognised.

Various etiological factors implicated in the pathogenesis of PSH, some are related to the patient as obesity, co-morbidities, poor nutrition, port site infections and pre-existing umbilical and paraumbilical hernia, others are related to the disease being treated as large gallstones or technical aspects of the procedure as large trocar size, number of trocars, midline trocar, incomplete closure of fascia at the port site and the effect of partial vacuum while port withdrawal.[1,6,11,22-24]

The optimal treatment strategy of this complication is not finally clarified[16,25] although it can be done by suture or mesh repair, by open or laparoscopic methods.[1,25,26] However, prevention remains the best treatment. This prevention requires knowledge of the risk factors for this condition.[23,26] understanding the musculoaponeurotic layers of the abdominal wall for efficient and safe entry into the peritoneal cavity[1,4] and the proper closure of the fascial defects.[1,27]

The aim of this study is to determine the incidence of PSH and its presentation in patients underwent LC as it is the most common laparoscopic surgery performed in our institute.

PATIENTS AND METHODS

This prospective study was done in the Laparoscopy Unit- Department of General Surgery- Baquba Teaching Hospital – Diyala – Iraq, from January 2017 to June 2020. A total of 467 patients, of different age groups and genders and, in whom successful LC was done for gallstone diseases, were included. Patients with less than one year postoperative follow up were excluded from the study.

During LC, pneumoperitoneum was established by either closed or open technique (depending on the surgeon's preference) through a small infra-umbilical incision. Then the procedure was completed by using standard four ports. At the end of the operation, all fascial defects of 10 mm or larger were sutured while smaller defects were left without closure.

The patients were seen after 3 days from the hospital discharge, on the 10th postoperative day, then after one month, 6 months and at the end of the first year. Meanwhile patients were given instruction to visit the surgeon whenever they notice or feel any problems at the port sites.

Data regarding the demography of the patients and the development of PSH, its presentation, complicatins, operative findings and type of repair were collected using specially designed data collection sheath.

RESULTS

The total number of the patients included in this study was 467 patients. Sixty six male (14.13%), and 401 female (85.87%). As shown in figure 1.

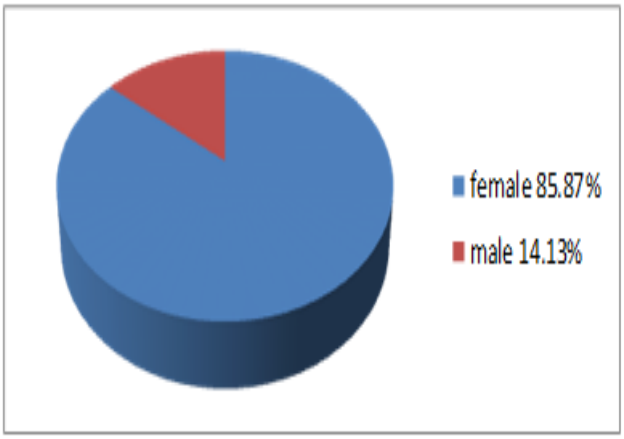

Fig. 1: Percentage of patients' sex in the study.

Patients' age ranged from 10 years to 77 years with a mean age of 42 years. Table 1 shows distribution of patients according to the age.

Table 1: The distribution of patients according to the age.

Age	- 20	21-30	31-40	41-50	51-60	61-	Total no.
Total	32	87	131	103	83	31	467

During the follow up peroid, five patients had PSH (1.07%), four female patients and one male. The age of the patients ranged from 27-50 year, all the four female patients had hernia at the site of the umbilical port, while in the male patient the hernia was at the site of the epigastric port. The period between the LC and the diagnosis of PSH ranged from 3 months to 15 months, one patient presented as an emergency case of strangulated hernia at the site of the umbilical port, while the other four patients presented as elective cases.

One patient refused repair while in the other 4 patients repair was done by open method. In the patients with hernias at the site of umbilical port, a loop of small intestine was found in 2 patients (One with strangulation) and omentum in the third patient. Extraperitoneal fat was the content of the hernia in the patient with epigastric hernia. In the patient with emergency presentation due to strangulated bowel, repair was done by primary suturing, while in the others mesh was used. Table 2 shows the presentation, findings and method of repair in our patients.

Table 2: The presentation, Findings and Method of repair in patients with PSH.

Sex	*4 female* *1 male*
Age	*27-50 years*
Type of the hernia	*4 umbilical hernia* *1 epigastric hernia*
The duration between LC and the diagnosis of PSH	*3m-15m*
The presentation	*4 elective* *1 emergency*
Operative findings	*2 patient with small intestine loop* *1patient with omentum* *1patient with extraperitoneal fat* *1 patient refuse repair*
Method of repair	*Mesh in 3 patients* *Nylon repair in one patient (emergency)*

DISCUSSION

PSH is uncommon complication of laparoscopic surgery but assumes significance due to the associated morbidity and need for a revision procedure[7,11,15] in general the risk of laparoscopic port site incisional hernia is much lower than the incisional hernia complicating open abdominal operations.[24]

The real incidence of PSH is probably underestimated due to multiple factors[1,17] as some patients remain asymptomatic (while the available data are based only on symptomatic patients) and some other symptomatic patients do not return to the primary surgeon[9,15,25,28,29] The overall incidence and the diagnostic accuracy of PSH might increase when the clinical examination is combined with a routine use of more efficient diagnostic tool like abominal ultrasound or CT scan with a long – term follow up.[9,18,19,30]

The incidence of post-cholecystectomy PSH in this study was 1.07 % during a one year follow up, in the studies of Malik E et al[3] and G Chatzimavroudis et al[5] the incidences of PSH were 3.4% and 0.6% after one year follow up. The incidence seems not to be change significantly with longer follow up periods, as in the studies of Sheikh Firoj Kabir et al[4] who observed PSH in 2% of patients after a follow up period of 2 years, Madureira FA et al[6] who observed PSH in 3.57% of post LC patients after a mean follow up of 40.4 months, Vejarano LLM et al[31] found that 2.3% of the post-cholecystectomy patients were identified with PSH over a mean follow up period of 49.5 months and Tonouchi H et al[28] in whom the incidence was 1.48% after five years while Rodrı´guez de Guzma´n Caet al[22] after more than 3 years follow up, observed an incidence of 29.6% of PSH and most of these hernias were detected in the first 2 years postoperatively. Jehangeer et al[7] reported no incidence of hernia after LC in one year follow up.

In our study PSH was diagnosed in the umblicus in 4/5 patients (80% of cases) and one patient (20%) had a hernia at the site of the epigastric port while no hernia was diagnosed at the smaller lateral port sites. Mohammad Nibih Nofal et al,[2] Malik E et al,[3] Sheikh Firoj Kabir et al,[4] Hyun Jeong Ki et al.[10] David Mark Bunting,[14] Muthammal R[20] and Rikki Singal[23] also observed in their sudies that PSH occurred more frequently at the site of 10 mm port at the umbilicus, probably due to the large size trocar, thinness of the umbilical skin and weakness in linea alba[1,2] PSH also reported in 5mm laterally placed ports[3] but these sites are less liable for postoperative hernia formation due overlapping of muscles and multiple fascial planes.[1] While in Jehangeer et al[7] study, the 10 mm ports created for laparoscopic cholecystectomy were not at risk for PSH formation even when the fascial sheath were not closed.

The time of PSH occurrence ranged from 3 weeks to 6 months postoperatively, varied from 2 days to 18 months postoperatively in the study of Mohan Venkatesh Pulle[1] and ranged from 5 days to 3 years with an average of 9.2 months in the study of Muthammal R[20] While in our study the period between the LC and the diagnosis of PSH ranged from 3 months to 15 months.

The majority of our patients (4/5) presented as elective cases except one as an emergency case with strangulated bowel, Karim Nacef et al[26] reported that about a quarter of their patients presented as strangulated hernia and operated urgently. In this study, patients with PSH at the umbilicus, a loop of small intestine was seen in two patients, omentum in one patient while the other patient refuse repair, in the patient with epigastric PSH, extraperitoneal fat was seen. In the studies of Mohammad Nibih Nofal et al[2] and Tayeb S Kareem et al [12] all hernias contained omentum, while Karim Nacef et al[26] reported that the hernial content was omentum in 58% and small bowel in 42% of cases.

CONCLUSIONS

- PSH is an uncommon but an important dangerous complication of minimal invasive procedures, that requires long – term follow up by clinical examination with a routine use of diagnostic imaging techniques like abominal ultrasound or CT scan.
- Knowing of the risk factors and taking the preventive measures by the laparoscopic surgeons are important to reduce the incidence of PSH after laparoscopic operations.

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