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Port-site hernia after laparoscopic cholecystectomy: retrospective clinical experience

Laparoskopik kolesistektomi sonrasi port yeri fıtığı: retrospektif klinik deneyim

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Abstract

Purpose: Laparoscopic cholecystectomy is the gold standard in patients scheduled for cholecystectomy. Complications related to laparoscopy may occur during or after laparoscopic cholecystectomy. This study is aimed to examine the incidence of port-site hernia and its predisposing factors.

Materials and methods: Laparoscopic cholecystectomy operations performed in the general surgery clinic of our hospital between January 2016 and March 2021 were reviewed retrospectively. The pneumoperitoneum was created by entering the abdomen with a mini-incision from the umbilicus using the Hasson technique. All cholecystectomies were performed using the 4-port technique. The umbilical trocar fascia was closed in all patients. Demographic data were evaluated retrospectively.

Result: The incidence of port-site hernia was determined as 0.5%. The umbilical hernia was detected in 15 patients: 11 male and four female. The mean age was 55.4 years. The mean hernia detection time was 14.3 months. The mean body mass index [BMI] was found to be 30.11. Four patients had a chronic disease. Fourteen of the patients underwent surgery. One of the patients was operated on a mini-incision urgently due to the development of strangulation. Recurrence was detected in three patients. No mortality was observed.

Conclusion: Obesity, age, and female gender are considered important risk factors. In our series, fascial closure was performed instead of the umbilical port in all cases, but most of the port site hernias originate from the umbilicus port.

Key words: Port-site hernia, fascial closure, risk factor, laparoscopic cholecystectomy.

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Öz

Amaç: Kolesistektomi planlanan hastalarda laparoskopik kolesistektomi altın standarttır. Laparoskopik kolesistektomi esnasında veya sonrasında laparoskopiye bağlı komplikasyonlar görülebilir. Bu çalısmada port yeri hernisi insidansı ve predispozan faktörlerinin incelenmesi amaçlanmaktadır.

Gereç ve yöntem: Ocak 2016-Mart 2021 tarihleri arasında hastanemiz genel cerrahi kliniğinde yapılan laparoskopik kolesistektomi operasyonları retrospektif olarak incelendi. Pnömoperitoneum oluşturmak için hasson tekniği kullanıldı. Tüm kolesistektomiler 4 port tekniği ile yapıldı. Tüm hastalarda umbilical trokar fasyası kapatıldı. Demografik veriler retrospektif olarak değerlendirildi.

Bulgular: Port yeri hernisi insidansı %0,5 olarak bulundu. 15 hastada umblikal herni saptandı. 11 hasta erkek 4 hasta kadın idi. Ortalama yaş 55,4 idi. Ortalama herni tespit süresi 14,3 ay idi. Ortalama BMI 30,11 olarak bulundu. 4 hastada kronik hastalık mevcut idi. 14 hasta opere edildi. 1 hasta acil strangülasyon gelişmesi üzerine acil opere edildi. 3 hastada nüks saptandı. Mortalite gözlenmedi.

Sonuç: Obezite, yaş kadın cinsiyet önemli risk faktörleri olarak degerlendirilmektedir. Serimizde umblikal port yerine tüm olgularda fasiyal kapama yapılmakta ancak en çok port hernisi umblikus portundan kaynaklanmaktadır.

Anahtar kelimeler: Port yeri hernisi, fasiyal kapama, risk faktörleri, laparoskopik kolesistektomi.

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Introduction

In 1985, surgeon Erich Mühe was the first to perform the laparoscopic cholecystectomy operation [1, 2]. It was later applied by Philippe Mouret in 1987 in France [3]. Although laparoscopic cholecystectomy received great criticism at first, it has spread rapidly worldwide due to less postoperative pain, better cosmetic result, faster recovery, les hospital stays, and fast return to work [4, 5]. Complications (trocar injury, hypercapnia due to pneumoperitoneum, port-site hernia, etc.) started to be seen due to the widespread use of laparoscopy [6]. The type of hernia developed by laparoscopy was called port-site hernia. In different studies, the incidence of port-site hernia was given at different intervals (0.5-23.7%) [7-9].

The gallbladder is removed using the location of one of the 10 mm ports. Publications are stating that both 10 mm port sites can be used, and the general approach is to leave it to the surgeon's opinion [10, 11].

Old age, female gender, chronic disease (diabetes mellitus (DM), pulmonary disease etc.), obesity, trocar blade type, trocar size, trocar incision enlargement, surgical site infection and increased intra-abdominal pressure are shown as factors that increase the development of port site hernia [12-14].

This study presents the incidence and risk factors of port-site hernia after laparoscopic cholecystectomy.

Material and method

The data of 2,978 patients who underwent laparoscopic cholecystectomy between January 2016 and March 2021 in the Department of General Surgery at the Istanbul Medeniyet University Goztepe Prof. Dr. Suleyman Yalcin City Hospital were retrospectively analyzed. Excluded from the study were patients with primary umbilical hernia or recurrent hernia, and patients who were switched from laparoscopic to open surgery. Port-site hernia was detected in 15 patients. It was determined that 14 patients underwent surgery with the diagnosis of port site hernia.

Ethical approval was obtained from the Ethics Committee of our hospital.

This study used demographic analysis for statistics due to the small number of patients.

The Laparoscopic cholecystectomy operation was performed with the same technique in all patients. Under endotracheal general anesthesia, a mini-incision was made from the umbilicus, and the abdomen was entered with the open method [Hasson technique]. It was inserted with a 10 mm trocar. Carbon dioxide [CO2] was insufflated. After the pneumoperitoneum (12 mmHg) was created, the camera was entered into the abdomen through the 10 mm port, and exploration was achieved. The abdomen was entered with two 5 mm trocars from the right subcostal region and one 10 mm trocar from the epigastric region under the xiphoid. Facial closure suture was applied only to the umbilical port area.

Results

A laparoscopic cholecystectomy procedure was performed in 2.978 patients between January 2016 and March 2021 in the general surgery clinic. In the retrospective data scan from the records, port-site hernia was detected in 15 patients, and 14 patients were operated on. Eleven of the patients were female (73.33%) and four were male (26.67%). The mean age was 55.4 (34-84), and the median age was 53. Four of the patients had a chronic disease (26.67%). DM was found in two patients, asthma in one patient, and asthma and DM in one patient. Three of the operated patients had a history of acute cholecystitis before the operation. One of the patients with a history of acute cholecystitis had a history of Endoscopic Retrograde Cholangiopancreatography (ERCP). The mean hospital stay after cholecystectomy was 1.15 (1-2) days. The mean BMI was 30.11 (22.22-41.62). Of the patients, one was morbidly obese, two moderately obese, and four mildly obese. Eight patients had a normal BMI. Mean port-site hernia development time was 14.3 (0-37) months. Hernia developed at the umbilical port site in 13 (86.67%) patients and at the epigastric port site in 2 (13.33%) patients. Five patients underwent primary hernia repair, and nine patients underwent mesh hernia repair. After cholecystectomy, one patient presented to the emergency service with the development of umbilical port site hernia on the sixth postoperative day. The patient was hospitalized with a preliminary diagnosis

of strangulated hernia. The patient was taken into an emergency operation. In the operation, the intestines were evaluated as viable, and resection was not performed. The hernia defect was repaired primarily. The other 13 patients were operated on electively. Recurrence was observed in three (21.4%) patients during follow-up. The mean recurrence time in patients with hernia repair was 19 (12-29) months. No mortality was observed during the follow-up. No complications requiring hospitalization were observed in patients who followed up for port-site hernia. The clinical features are detailed in Table 1.

Table 1. Clinical features of cohort

		N	%
Sex	Male	4	26.67
	Female	11	73.33
Age		55.4 (34-84)	
Cause Of Cholecystectomy	Chronic Stone Cholecystitis	12	80
	AcuteStone Cholecystitis	3	20
Complaint	NO	1	6.67
	Swelling at the Incision or pain	13	86.67
	Acute Pain	1	6.67
Surgical Treatment	YES	14	93.33
	NO	1	6.67
Operation Type	Emergency	1	7.14
	Elective	13	92.86
Hernia Site	Umbilical	13	86.67
	Epigastric	2	13.33
	5 mm port	0	
Chronic Disease	Diabetes	2	13.33
	Asthma	1	6.67
	Diabetes + Asthma	1	6.67
BMİ	BMI <30	8	53.33
(Body Mass Index)	BMI 30-34.)	4	26.67
	BMI 35-39.9	2	13.33
	BMI>40	1	6.67
Hernia Repair	NO	1	6.67
	Mesh	9	60
	Primary	5	33.33
Mortality	Totally	0	

Discussion

The incidence of a port-site hernia developing after laparoscopic procedure is found to be less than normal. Because sometimes port site hernias may not show any symptoms. Publications are reporting different incidences in the literature due to reasons such as lack of follow-up and absence of symptoms [15]. Comajuncosas et al. [16] found the incidence of port-site hernia to be 25.9% in their 2011 study. Again, in a study by Uslu et al. [17], the incidence was reported as 5.2%, and in another series, a rate of 0.08% was reported [18]. In our study, the rate was 0.5%.

There are literature reports that strangulated port-site hernia develops after laparoscopic surgery. In a study conducted by Nacef et al. [19], five patients were operated on urgently for strangulated hernia in a series of 19 patients. Again, in a published case report, a strangulated hernia was detected on the second post-op day after laparoscopic cholecystectomy, and it was operated on [20]. In our series, one patient was operated on for strangulated hernia on the seventh postoperative day. It was observed that the small intestine was compressed into the hernia defect. No organ resection was required.

In the series performed by Nacef et al. [19], recurrence was observed in two (10.5%) patients. In our study, recurrence developed in three (21.43%) of 14 patients who were operated on.

Age, obesity, gender, chronic disease, incision size, surgical site infection development, trocar size, a trocar with or without a blade, cholecystitis status, etc., are shown as predisposing factors in the development of port-site hernia [14, 16, 21, 22]. In our series, the standard open-entry method was used for all cholecystectomy procedures. All trocars used had a disposable blade. In all patients, the gallbladder was removed from the abdomen at the epigastric port location.

In the study of Uslu et al. [17], age (mean age 60 years) and female gender were found to be risk factors. In our series, the patients who developed port-site hernia were female (73.33%). The mean age was 55.4.

In a single-center, 10-year series conducted by Chatzimavroudis et al. [21], BMI greater than 30, development of surgical site infection, and enlargement of the incision were determined as important risk factors. In our series, the mean BMI was found to be 30.11 in patients with trocar site hernia. The BMI was greater than 30.0 in 46.67% of the patients. However, surgical site infection was not detected in cases with port hernia in our series.

It has been reported in the literature that port-site hernia develops mostly from the umbilical port site [15]. In our study, it developed from the umbilical port site in 13 patients (86.67%).

In the literature, it is generally recommended to study 10 mm port locations; however, there is no consensus. Mayol et al. [23] found no difference between fascia closure and non-closure in their study with 403 patients. Again, Singal et al. [24], in their study of 200 people in 2016, argued that fascia closure is not necessary. In our series, umbilical port sites were closed with 1.0 vicryl in all patients, and facial closure was not performed at other port sites. The facial closure procedure was performed with the same procedure in all patients with the single suture method. During the operation, fascial closure was performed by a novice doctor (Assistant doctor with 1 to 2 years of experience) on the surgical team.

The gallbladder can be taken out of the abdomen from the port in the umbilical or epigastric regions. In the meta-analysis of Kulkarni et al. [25], a significant rate of port-site hernia development was reported when the gallbladder was removed from the umbilical port. In a meta-analysis by Sood et al. [26], trocar hernia development was not found to be statistically significant in removing the gallbladder from either the epigastric or umbilical trocar sites. In our series, the gallbladder was removed from the abdomen using the epigastric port in all patients.

Limitations

This study is retrospective. Cholecystectomy operation was performed by different surgical teams. Radiologic control of the patients who were asymptomatic and did not show any symptoms on physical examination was not performed. Fascia closure in operation was performed by novice doctors. Due to the COVID-19 pandemic, some checks are missing or done by teleconference.

In our series, the incidence of port-site hernia after laparoscopic cholecystectomy is found to be low. Obesity, age, and the female gender are considered important risk factors. In our series, fascial closure is performed in all cases instead of the umbilical port, but most port-site hernias originate from the umbilicus port. Although there is no complete information in the literature on the relationship between the experience of surgical assistants and the development of port site hernia, we think that a research plan with a large number of prospective cases will clarify this issue. Long-term results of a prospective, well-designed study will give more reliable results about port-site hernia occurrence.

Conflict of interest: No conflict of interest was declared by the authors.

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Authors' contributions to the article

F.B. and M.A. have constructed the main idea and hypothesis of the study. F.B., H.B., M.A. and M.S.O. They developed the theory and arranged the material and method section. F.B., M.S. and H.B. have evaluated the data in the Results section. Discussion section of the article Written by M.A. and F.B.

F.B., H.B., M.S. and M.S.O. reviewed, corrected and approved. In addition, all authors discussed the entire study and approved the final version.