

Effectiveness of simultaneous umbilical hernia primary repair with laparoscopic cholecystectomy

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ABSTRACT

OBJECTIVE: Umbilical hernia repair can be easily performed simultaneously with laparoscopic cholecystectomy. The use of mesh is recommended for hernias larger than 1 cm. In this study, patients with primary repair of umbilical hernia simultaneously with laparoscopic cholecystectomy were evaluated. It aimed to present the effectiveness of this method and the effect of body mass index (BMI) on treatment results.

METHODS: The records of patients who underwent primary repair of umbilical hernia simultaneously with laparoscopic cholecystectomy between 2014 and 2021 were reviewed retrospectively. Patients' age, gender, BMI, length of hospital stay, recurrence and reoperation information, and follow-up times were analyzed. The patients were examined in three groups according to their BMI, and the effect of BMI on treatment was investigated.

RESULTS: patients were included in the study. Median values of the patients for age, BMI, hospitalization, and follow-up were 63 (28–94), 31 (20–51) kg/m², 1 (1–25) days, and 23 (0.6–76) months, respectively. Recurrence was detected in 8 patients. BMI was <25 in one patient with recurrence and >30 in 5 patients. There was no significant correlation between length of stay, number of relapse and reoperation, and BMI ($p>0.05$).

CONCLUSION: In our study, the recurrence rate was found to be higher than the studies reported with the use of mesh, and most of the patients with recurrence are obese, although it is not statistically significant. If the recurrence rate is acceptable, we believe that repair with primary suture is feasible in umbilical hernia.

Keywords: Cholelithiasis; mesh; primary repair; umbilical hernia.

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Gallstones affect approximately 15% of the population in the United States [1]. In the presence of symptomatic gallstones, laparoscopic cholecystectomy is used as the primary surgical method [2]. Umbilical hernia is defined as an abdominal wall defect in the midline from 3 cm above the umbilicus to 3 cm below the umbilicus, and its prevalence is 2%. Symptomatic umbilical hernias are treated with primary or mesh-reinforced repair, with 5–10% recurrence reported [3]. Although there is insufficient evidence for the use of mesh in cases with umbilical hernia size <1 cm, mesh repair is recommended for defects between 1 and 4 cm [4].

Despite the fairly conclusive evidence to support the use of mesh to reduce recurrence rates in open umbilical hernia repair, approximately 50% of elective umbilical hernias are repaired with primary suture in the United States [5]. Cases requiring intra-abdominal or abdominal wall operation can be performed simultaneously with laparoscopic cholecystectomy. The rate of umbilical hernia detection in patients scheduled for laparoscopic cholecystectomy has been reported in the literature, with frequencies ranging from 3.4% to 12% [6–10]. While performing laparoscopic cholecystectomy in patients with umbilical hernia, surgeons can also repair this hernia.

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TABLE 1. Detailed data of patients

	General (%)	Recurrence (%)
Patients (n=71)	100	11.2
Gender		
Male	32	62
Female	68	38
	Median (Min–Max)	Median (Min–Max)
Age	63 (28–94)	62.5 (57–85)
BMI (kg/m ²)	31(20–51)	33.5 (23–45)
Length of stay (day)	1 (1–25)	1 (1–2)
Follow-up (month)	23 (0.6–76)	15.5 (4–70)

BMI: Body mass index; Min: Minimum; Max: Maximum.

In this study, patients who underwent laparoscopic cholecystectomy and simultaneous primary hernia repair due to cholelithiasis and umbilical hernia were examined. It was aimed to determine the effectiveness of this simultaneous technique and the effect of body mass index (BMI) on treatment results.

MATERIALS AND METHODS

Ethics committee approval of this study was obtained with project number KA21/267. In our study, the records of patients who underwent laparoscopic cholecystectomy for cholelithiasis between January 2014 and May 2021 were reviewed retrospectively. Patients with complete laparoscopic surgery, simultaneous primary umbilical hernia repair, and complete data were included in the study. In these patients, standard laparoscopic cholecystectomy was performed by inserting a camera trocar through the umbilical defect and performing primary hernia repair with polypropylene suture.

Patients who were converted from laparoscopic to open cholecystectomy, had umbilical hernia repaired with mesh, and had multiple data deficiencies were excluded from the study. The findings of the patients were obtained by searching their records in the hospital automation system and by calling them by phone. Patients' age, gender, BMI, length of stay, recurrence and reoperation information, and mean follow-up times were recorded and analyzed. Patients were divided into Groups 1, 2, and 3 according to BMI <25, 25–30, and >30 accordingly.

Highlight key points

- As in all laparoscopic cases, simultaneous umbilical hernia is encountered during cholecystectomy.
- Simultaneous repair of these hernias can be done effectively with or without mesh.
- Repairs without mesh were higher in patients with high BMI, although it was not significant.

Statistical Analysis

As descriptive statistics, frequency (n) and percentage (%) were taken into account in the evaluation of categorical variables, and median (minimum–maximum) values were taken into account in the evaluation of numerical variables. Fisher's exact test was used to compare BMI with recurrence and reoperation, and Kruskal–Wallis test was used to compare with length of stay. Type I error probability was determined as $\alpha=0.05$ in all statistical analyzes and all analyzes were performed using IBM SPSS v25 program. $P\leq 0.05$ was considered as statistically significant.

RESULTS

A total of 71 patients, 23 (32%) male and 48 (68%) female, were included in the study. The largest umbilical hernia diameter was 3 cm. The median values of the patients' age, BMI, hospitalization, and follow-up period were 63 (28–94), 31 (20–51) kg/m², 1 (1–25) days, and 23 (0.6–76) months, respectively. Two patients, aged 74 and 57, with BMI of 37 and 40, with chronic obstructive pulmonary disease and coronary artery disease, died on the 20th and 25th postoperative days due to respiratory failure. Since these two patients could not be discharged after surgery, they were the patients with the longest hospital stay and the shortest follow-up period. There were 8 (11.2%) patients with relapse, of which 5 were male and 3 were female. The median of age, BMI, hospitalization, and follow-up period of the patients with relapse were 62.5 (57–85), 33.5 (23–45) kg/m², 1 (1–2) days, and 15.5 (4–70) months, respectively. Prolene mesh-reinforced herniorrhaphy was performed in 3 of these patients due to recurrence, while remaining 5 patients rejected reoperation (Table 1). In terms of BMI of the patients, there were 5, 30, and 36 patients in Groups 1, 2, and 3, respectively. The median length of hospital stay was 1 day in all three groups. Postoperative recurrences were observed in 1, 2, and 5 patients in

TABLE 2. Recurrence, reoperation, and hospitalization times according to BMI

	<25 (n=5)	25–30 (n=30)	>30 (n=36)	p
Length of stay (day)				
median (min–max)	1 (1–1)	1 (1–2)	1 (1–25)	0.211
Recurrences (n)				
None	4	28	31	0.325
Present	1	2	5	
Reoperation (n)				
None	5	29	34	0.999
Present	-	1	2	

BMI: Body mass index; Min: Minimum; Max: Maximum.

Groups 1, 2, and 3, respectively. There were 1 patient in the 2nd group and 2 patients in the 3rd group that were reoperated. There was no significant relationship between BMI groups in terms of length of stay ($p=0.211$). 12.5% ($n=1$) of the relapsed cases had a BMI below 25 and 62.5% ($n=5$) had a BMI above 30, but the correlation between relapse and BMI was not statistically significant ($p=0.325$). The relationship between reoperation and BMI was not statistically significant ($p=0.999$) (Table 2).

DISCUSSION

Although gallstones can be seen at any age, the incidence increases with age, and gallstones can be seen in approximately 50% of patients after the age of 80 [2]. Umbilical hernias are more common in women than men in general; however, series in which male patients are more common are also found in the literature [11]. There were 23 (32%) male and 48 (68%) female patients in our study, and the median age was 63 (28–94) years.

It has been observed in many studies that the use of mesh in elective umbilical hernia repair reduces the risk of recurrence and does not increase complications [3, 12]. After laparoscopic cholecystectomy and simultaneous mesh-reinforced umbilical hernia repair, no recurrence was observed in a mean follow-up of 23 months [13], and in a different study in which primary suture repair was performed, recurrence was observed in 9.4% of the patients [8]. In our study, there were 8 (11.2%) patients with recurrence and the median follow-up period was 23 (0.6–76) months.

The current evidence indicates that laparoscopic cholecystectomy can be safely performed as an outpatient surgical procedure in selected patients [14]. It has been reported that the average hospital stay was 3.2 days in 401 intra-abdominal or abdominal wall-related operations performed simultaneously with laparoscopic cholecystectomy [6]. The median length of hospital stay of our patients was 1 (1–25) days. Patients who died due to comorbidities were the reason for long hospitalization. It was observed that umbilical hernia repair applied in addition to cholecystectomy did not prolong the hospital stay.

With the increase in obesity and metabolic syndrome, an increase in the diagnosis of cholelithiasis has begun to be observed [1]. According to the World Health Organization, those with BMI <25 kg/m² are classified as normal, those with 25–30 kg/m² as overweight, and those with >30 kg/m² as obese [15]. In 2016, it was reported that 39% of individuals aged >18 years in the world were overweight and 13% were obese. In Türkiye, 19.9% of individuals aged >15 years are obese and 33.7% are overweight [16]. Although there are studies that did not find a relationship between BMI and umbilical hernia recurrence [17], it has been reported that obesity (BMI >30) is associated with high recurrence risk and morbidity in many other studies [8, 11, 18]. In our study, there were 5, 30, and 36 patients in the 1st, 2nd, and 3rd groups according to BMI, respectively. BMI values were below 25 in 12.5% ($n=1$) of the cases with recurrence and above 30 in 62.5% ($n=5$). No significant correlation was found between the length of hospital stay, the number of recurrences and the number of reoperations, and BMI ($p>0.05$).

We know that our study has several limitations, such as the relatively small number of patients and the absence of a control group. However, we think that our experience with simultaneous laparoscopic cholecystectomy and umbilical hernia repair contributes to the literature.

Conclusion

In our study, the recurrence rate was found to be higher than the studies reported with the use of mesh, and although it was not statistically significant, most of patients who developed relapse were obese. We think that repair of accompanying umbilical hernia with primary suture in patients undergoing laparoscopic abdominal surgery will have an acceptable recurrence rate.

Ethics Committee Approval: The Baskent University Institutional Review Board granted approval for this study (date: 25.05.2021, number: KA21/267).

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