

First Port Insertion in Laparoscopic Cholecystectomy in Patients with Previous Abdominal Operations

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Abstract: **Background:** Previous abdominal surgery has been reported as a relative contraindication to laparoscopic cholecystectomy. Previous abdominal surgery particularly is associated with difficulty placing the initial trocar and obtaining adequate exposure to the gallbladder. **Aim of the study:** This study specifically examined the effect of previous intraabdominal surgery on the feasibility and safety of laparoscopic cholecystectomy. **Methods:** Data from 161 consecutive patients who underwent laparoscopic cholecystectomy were prospectively analyzed for method and site of first port insertion, operative times, CO₂ consumption, adhesion score, intra- and postoperative complications, and open conversion rates for patients with previous abdominal surgery. **Results:** 161 patients had undergone previous abdominal surgery: 13 upper and 148 lower abdominal operations. Adhesions were found in 92 %, 37.8% of patients respectively, who had previous upper or lower abdominal operations. There were complications directly attributable to adhesiolysis and or to Veress needle insertion. Patients with previous upper abdominal surgery had a longer operating time (65.33 ± 46.76 min), a higher CO₂ consumption mean±SD (98.78±57.84L), higher complication(46.1%), higher open conversion rate (30.8%), than those who had undergone previous lower abdominal surgery (50.06 ± 22.38 min , 89.51±52.68, 14.2%, 2% respectively) .**Conclusions:** Previous abdominal operations, even in the upper abdomen, are not a contraindication to safe laparoscopic cholecystectomy. However, previous upper abdominal surgery is associated with an increased need for adhesiolysis, a higher open conversion rate, a prolonged operating time.

Keywords: Laparoscopic cholecystectomy, Adhesions, Complications, Abdominal surgery.

INTRODUCTION

When laparoscopic cholecystectomy began in the early 1990s, pregnancy, previous abdominal surgery, obesity, cirrhosis, and acute cholecystitis were considered absolute contraindications for performance of the laparoscopic technique. As advances in laparoscopic skills and instrumentation have evolved, a range of increasingly complex procedures have been performed, making all of these traditional contraindications at best relative.

Previous abdominal surgery particularly is associated with difficulty placing the initial trocar and obtaining adequate exposure to the gallbladder. The potential risk for injury of organs adherent to the abdominal wall during Veress needle or trocar insertion as well as the necessity for adhesiolysis and its attendant complications are the two major specific problems constraining surgeons from performing laparoscopic cholecystectomy for patients with previous abdominal surgery. With increasing experience, however, many surgeons have felt that laparoscopic cholecystectomy is feasible for such patients.¹

The intra-abdominal adhesion score was defined by Blauer and Collins, 1988:

Grade 0=no adhesions;

Grade 1=thin, narrow and easily separable adhesions;

Grade 2=thick adhesions in a well-defined area;

Grade 3=thick and widespread adhesions in a well-defined area;

Grade 4=thick and widespread adhesions, including adhesions to the anterior and posterior abdominal wall.

In these patients, due to adhesions the risk for intestinal injury is high during the placement of the first trocar, and intestinal injury in these patients may be unrecognized due to the limited field of vision. In providing exposure of the gallbladder, careful adhesiolysis necessary to avoid injuries to organs. All of these procedures are time-consuming and require experience. With a basic goal being that of avoiding morbidity, conversion to open surgery can become necessary; however, the advantages of laparoscopic cholecystectomy encourage most surgeons to try to complete the procedure successfully.(Binenbaum, S.J. *et al.*, 2006)

Although many access techniques are still generally accepted, the routine use of an open technique should reduce the risk of major trocar injuries. Trocar injury to a hollow viscus or to major vessels is two of the more serious complications of laparoscopic access.(Binenbaum, S.J. *et al.*, 2006)

This study examine the effect of previous intraabdominal surgery on the feasibility and safety of laparoscopic cholecystectomy, in terms of Safe insertion of the first port, complications, adhesions, time of surgery ,and conversion to open surgery.

PATIENTS AND METHODS

This is prospective study done in Baghdad teaching hospital from October 2010 to October 2011. Data was collected from 161 patients with previous abdominal surgery. Previous abdominal surgery through a midline or paramedian incision was classified as upper abdominal surgery when the scar extended above the umbilicus and as lower abdominal surgery when the scar was located below the umbilicus. Transverse or oblique abdominal incisions also were classified on the basis of their relation to the umbilicus as upper or lower abdominal surgery. So patients were assigned to one of two groups according to the location, relative to the umbilicus, of the incision that had been used for the previous abdominal operations:

Group 1: upper abdominal scar.

Group 2: lower abdominal scar.

The two groups were compared with respect to the following variables: age, sex, body mass index , intraabdominal adhesion score, site of first port insertion, time of first port insertion, time of operation (from cutting of skin to skin suturing), total volume of CO₂ gas consumption , drain use, intraoperative or postoperative complications and conversion rates. A standard four trocar technique was used.

The initial access to the abdominal cavity was at the umbilicus, LUQ or Subxiphoid, either by a blind or open technique. If the patient had previous lower abdominal surgery, the Veress needle was inserted at the upper edge of the umbilicus, and when an upper abdominal scar was present, the needle was inserted at the lower edge of the umbilicus in most of the cases. For patients whose previous operations involved McBurney or

Pfannenstiel incisions (lower Group), a closed technique employing was in most of the patients. For patients with upper abdominal incisions, a Hasson's technique was used in most of the patients. The other trocars were placed appropriately according to the American technique, as adhesions were observed on the camera view.

The open (Hansson) technique for pneumoperitoneum creation and insertion of the initial trocar was used according to the discretion of the operating surgeon.

In most patients, before the trocar could be placed, blunt and sharp dissection with dissectors scissors were necessary. Intra-abdominal adhesion scores were assigned according to criteria similar to those defined by Blauer and Collins, 1988.

If adhesions were found under the umbilical incision, these were bluntly finger dissected.

Once the surgeon had entered the peritoneal cavity, only adhesions preventing adequate visualization and insertion of the remaining trocars or those interfering with adequate access to the operative field and the performance of laparoscopic cholecystectomy were dissected.

In patients in whom intraoperative complications were encountered, or in whom sufficient visibility for gallbladder dissection was unobtainable despite adhesiolysis, laparoscopic cholecystectomy was converted to open surgery. The informed consent was obtained from all participants.

RESULTS

During the period from October 2010 to October 2011, 161 patients had previously undergone abdominal operations, can be included in this study .148 were female (91.9%), 13 were males (8.1%). The previous operations involved the upper group in 13 patients (8.1%) and the lower group in 148 patients (91.9%). There is no significant difference in age of patients in two Groups (table 1).

Table 1: Characteristics of the abdominal incision Groups

		Upper G		Lower G		p-Value
		No.	%	No.	%	
Age	<25			13	8.8	0.883
	25-30	3	23.1	21	14.2	
	31-35	2	15.4	20	13.5	
	36-40	1	7.7	23	15.5	
	41-45	2	15.4	19	12	
	46-50	1	7.7	19	8	
	51-55	2	15.4	15	10.1	
	>55	2	15.4	18	12.2	
	Mean± SD	39.69±10.53		39.13±11.21		
Gender	Male	5	38.5	8	5.4	0.0001
	Female	8	61.5	140	94.6	
BMI(Kg/m ²)	< 25	6	60	25	22.1	0.023
	25-29	2	20	30	26.6	
	>30	2	20	58	51.3	

In patients with previous upper abdominal operations; 5 patients (38.8%) were males, in compares with lower Group 8 patients (5.4%). where is most of patients with lower abdominal operations were females (94.6%), the latter mostly due to cesarean section.

During laparoscopic cholecystectomy, various degrees of abdominal adhesions were found in (92.3%) of the patients with previous upper abdominal incisions in compares with lower

abdominal incisions (37.8%) (table 2) .patients with Grade 3 and 4 intraabdominal adhesion scores comprised the largest proportion of patients in the upper Group (41.7% and 25% respectively), in compares with the lower Group(8.9%,0% respectively). Acute cholecystitis was found in 6(4%) patients of the lower Group and only five patients completed the laparoscopic operation successfully (table 2).

Table 2: Intraoperative characteristics of the abdominal incision Groups

		Upper G		Lower G		p-Value
		No.	%	No.	%	
Adhesions	Yes	12	92.3	56	37.8	0.0001
	No	1	7.7	92	62.2	
Adhesion score	G1			29	51.8	0.0001
	G2	4	30	22	39.3	
	G3	5	41.1	5	8.9	
	G4	3	25			
Acute Cholecystitis				6	4	
Type of 1 st port insertion	Open	7	53.8	57	38.5	0.085
	Veress	2	15.4	68	46	
	Trochre	4	30.8	17	11.5	
	Vesiport			6	4	
Site of insertion	Upper umbilicus			91	61.5	
	Lower umbilicus	9	69.2	57	38.5	
	Left upper quadrant	2	15.4			
	Subxiphoid	2	15.4			

Regarding the methods of first port insertion ,open method was done in 7 patients(53.8%)of the upper Group and in 57 patients (38.5%) of the lower Group, where s closed method was done in 6patients (2 Veress needle,4 trocar) 46.2% of upper Group and in 91 patients (68 Veress

needle,17 trocar and 6 vesiport)61.5% of lower Group.

Regarding the site of first port insertion was 9 subumbilical, 2LUQand 2subxiphoid in patients of the upper Group, in compares with the lower

Group 57 subumbilical (38.5%) and 91 supraumbilical (69.2%), see table 2.

The time of laparoscopic cholecystectomy was longer in upper Group than the lower Group (mean \pm SD = 65.33 \pm 46.76 min. vs. 50.06 \pm 22.38 min.

respectively) for patients who were completed the laparoscopic surgery, and most of the patients had end laparoscopic cholecystectomy between 30 to 60 minutes (77.8% of upper Group and 59.3% of lower Group) see table 3.

Table 3: Intraoperative characteristics of the abdominal incision Groups (cont.):

		Upper G		Lower G		p-Value
		No.	%	No.	%	
Surgery time (min.)	<30			17	11.7	0.434
	31-59	7	77.8	86	59.3	
	>60	2	22.2	42	29	
	Mean \pm SD	65.33 \pm 46.76		50.06 \pm 22.38		
CO ₂ consumption (l)	<50	2	22.2	36	24.8	0.477
	51-74	3	33.3	33	22.8	
	75-99			28	19.3	
	>100	4	44.4	48	33.1	
	Mean \pm SD	98.78 \pm 57.84		89.51 \pm 52.68		
CO ₂ gas leak	Yes	3	23.1	32	21.6	0.903
	No	10	76.9	116	78.4	
1 st port insertion time open (min.)	Mean \pm SD	4.29 \pm 0.95		4.3 \pm 1.43		0.980
1 st port insertion time close (min.)	Mean \pm SD	3.5 \pm 0.71		3.27 \pm 1.05		0.758

There is a higher CO₂ gas consumption in patients with the upper Group in compares with the lower Group (mean \pm -SD=98.78 \pm 57.84 lit. vs.89.51 \pm 52.68 lit. respectively). There was no significant difference in the time of first port

insertion of the two Groups, but open method was longer than closed method. CO₂ leak occurred in 35 patients (3 upper, 32 lower Group) 21.7% and all of them due to the use of the open method (table 3).

Table 4: Operative and post operative complications of the previous abdominal incision Groups

		Upper G		Lower G		p-Value
		No.	%	No.	%	
Complications	Yes	6	64.1	21	14.2	0.01
	No	7	53.9	127	85.8	
Bleeding	Yes	3	23	2	1.4	0.001
	No	10	77	146	98.6	
Common bile duct injury	Yes	1	7.7	1	0.7	0.029
	No	12	92.3	147	99.3	
Small bowel injury	Yes			1	0.7	
	No	13	100	147	99.3	
Herniation	Yes			1	0.7	
	No	13	100	147	99.3	
Gallbladder perforation	Yes	2	23	15	10.1	
	No	11	77	133	89.9	
Infection	Yes			1	0.7	
	No	13	100	147	99.3	
Reoperation				1	0.7	

Regarding complication related to port insertion or during adhesiolysis, most of complications were found in the upper Group (46.1%) than lower Group (14.2%), regarding upper Group, bleeding occurred in 3 patients (23%) due to Omental injury (2patients)and mesenteric injury(1patient) during adhesiolysis and Veress needle insertion

respectively. Gallbladder perforation occurred in 2 patients due to sever adhesion. Common bile duct injury occurred in one patient due to severe adhesions near calots' triangle, bile duct injury was observed and converted to open surgery, and this injury was repaired with T-tube placement and suturing.

Regarding lower Group, bleeding occurred in 2 patients (one mesenteric injury, one Omental injury) during Veress needle insertion. Small bowel injury occurred in one patient during Veress needle insertion .For the mesenteric and small bowel injury the procedure converted to open surgery and the injury was repaired with sutures. Port site hernia occurred in one patient due to wide incision of open method was used. Bile leak due to

Gallbladder perforation occurred in 15 patients (10.1%) mostly due acutely inflamed Gallbladder in 4 patients or iatrogenic by trained surgeon in 11 patients (table 4).

Infection of first port insertion wound occurred in one patient who had open method. Reoperation occurred in one patients of lower Group due to bleeding from cystic artery (clips dislodgment). No death was recorded in both Groups.

Table 5: Types of the previous incisions and conversion rate in the abdominal incision Groups

	Total		With conversion	
	No.	%	No.	%
Upper	13		4	30.8
Right sub costal	1	7.7		
Right upper paramedian	2	15.3		
Upper midline	3	23.1	1	33.3
Transverse(supra umbilicus)	3	23.1		
Full midline	4	30.8	3	75
Lower	148		3	2
Lower midline	2	1.4		
Transverse (infra umbilicus)	3	2		
Right lower paramedian	1	0.7		
Pfannenstiel	107	72.3	1	0.9
Pfannenstiel+McBurney	8	5.4		
Pfannenstiel+Lower midline	5	3.3	2	40
McBurney	22	14.9		

Regarding types of previous abdominal incision(table 5), most of incisions in the upper Group were upper and full midline in 7 patients (53.9%) for perforated duodenal ulcer and Hydatid cyst of liver.transvers incision in 3(23.1%) patient of each Group used for paraumbilical hernia repair, and no conversion to open surgery were occurred in this incision type . Pfannenstiel and Mc Burney

comprised the largest portion (72.3%, 14.9%respectively) of the lower Group. Conversion rate (table 6)in upper Group 4(30.8%) of these 3 in full midline and one in upper midline, Conversion rate in lower Group 3(2.0%) of these 2 in Pfannenstiel+Lower midline incision (cesarean section and hysterectomy), and one in Pfannenstiel only incision(table 5).

Table 6: Conversion to open surgery in the abdominal incision Groups:

		Upper G		Lower G		p-Value
		No.	%	No.	%	
Conversion	Yes	4	30.8	3	2	0.0001
	No	9	69.2	145	98	

The reason for conversion in upper Group was inadequate visualization of structures due to adhesions in two patients, common bile duct injury and mesenteric injury one of each.

The reason for conversion in the lower Group was CBD injury due to acute cholecystitis, one small bowel injury and one mesenteric injury by Veress needle insertion.

DISCUSSION

In this study, we evaluated a large series of consecutive patients treated by laparoscopic

cholecystectomy in a single institution to examine the impact of previous abdominal surgery on the performance of laparoscopic cholecystectomy. Laparoscopic cholecystectomy was feasible and safe for most patients.

In our study, the patients with previous upper abdominal surgery mostly were male (38.5%) and normal weight (60%) than those with lower abdominal surgery mostly were female (94.6%) and obese (51.3%). The high incidence of cesarean sections and gynecologic operations in the lower

abdominal surgery group may explain the high prevalence of females among the patients with previous lower abdominal surgery. These patients experienced a longer operative time, and higher CO₂ gas consumption than the patients with lower abdominal surgery (table3), probably because adhesiolysis and initial trocar insertion by the open technique were performed more frequently in this group. These findings are in agreement with those of Ercan *et al.*, (2009) who reported most of upper abdominal surgeries were males, lower BMI, longer operative time and higher CO₂ gas consumption than those with lower abdominal surgery.

In our study the closed technique was used for 61.5% of the patients with lower abdominal incisions, blind Veress needle and initial trocar insertion was safe (in experienced hands) for the patients who had undergone previous lower abdominal surgery, in accordance with Mayol, *et al.*, (1997) The open Hasson technique with finger dissection of adhesions near the primary trocar site was used for 53.8% of the patients with upper abdominal incisions. In such cases, alternate approaches may need to be considered for primary trocar insertion, most notably a Subxiphoid, lateral, or left upper quadrant approach.(Goldstein, S. *et al.*, 2001)

Alternative methods of entry into the previously operated on abdomen for laparoscopic cholecystectomy have been reported. Kumar, (1998) described an initial Subxiphoid incision with blunt finger dissection for placement of the primary port. Patel and Smart, (1996) described inserting a Hasson trocar into the right iliac fossa, performing adhesiolysis, and then moving the camera to the umbilical port.

We rarely used a left upper quadrant initial puncture technique in patients who had previous lower midline incisions, because the tip of the Veress needle may perforate the colon or be buried in the omentum.(Karayiannakis, A.J. *et al.*, 2004) In the dissection of adhesions, we have generally used monopolar electrocautery with scissors or a hook. We have not encountered any problems with monopolar electrocautery, but bipolar electrocautery might also be used in this setting for safety reasons.

Yu, *et al.*, (1994) suggest that morbidity can arise in patients with either upper or lower previous incisions, and propose specific guidelines according to which laparoscopic cholecystectomy

can be performed safely in these patients. These authors recommend the use of open technique for the introduction of the first trocar, dissection of adhesions before the placement of the upper midline port, in our study; we used a Hasson technique more in upper than lower previous abdominal operations (53.8% vs, 38.5% respectively).

Once safe access has been achieved, the priorities of the laparoscopic surgeon change. The main goal is to perform an adhesiolysis sufficient for insertion of a second cannula to aid in visualization, retraction and dissection, as well as for the planned and flexible use of additional ports. The laparoscope then can be moved to different port sites without the need to perform a total adhesiolysis of all visible adhesions. Only the adhesions interfering with adequate access to the operative field and the performance of the procedure will need to be dissected. Adhesions may then also be circumvented by angling the laparoscope around their free edges or by placing the laparoscope through fenestrations in the adhesions themselves, providing further safety for laparoscopically driven adhesiolysis. Adequate preparation and preoperative planning will assess the geographic relation between the proposed surgery and the abdominal scar, directing an initial entry some distance from the area of previous scarring, selectively using the open technique for initial trocar insertion, and provisionally using limited careful adhesiolysis performed by a surgeon who has undergone a sufficient learning curve accrediting him or her to perform advanced laparoscopic techniques.(Karayiannakis, A.J. *et al.*, 2004)

Adhesions were found more frequently among the patients who had undergone previous upper (92.3%) than among those who had undergone previous lower (37.8%) abdominal surgery, the difference was statistically significant(P value=0.0001) .and the adhesions in the upper abdomen were more extensive and more dense than those encountered after lower abdominal surgery. This was reflected in the longer operating time and the higher conversion rate in this group of patients, but it did not affect the safety of the procedure. These findings are in agreement with those of Ercan, *et al.*, (2009) who reported that the adhesions in the upper abdomen were more common and more extensive and denser than those encountered after lower abdominal surgery. Acute cholecystitis was found in 6(4%) patients of the lower Group and only five patients presented

within three days (golden period) and completed the laparoscopic operation successfully. The other one converted to open cholecystectomy due to common bile duct injury.

Our findings of higher conversion rates among the upper incision group (30.8%) compared with the lower incision group (2%) is consistent with the findings reported by Karayiannakis, *et al.*, (2004) In their study, which included a total of 1638 patients who underwent laparoscopic cholecystectomy, patients with previous upper abdominal operations had a conversion rate of 19%, compared with a rate of 3.3% among patients with previous lower abdominal operations For patients with no history of previous abdominal surgery, the figure is 3.32%.

Regarding complication related to port insertion or during adhesiolysis, most of complications were found in the upper Group (46.1%) than lower Group (14.2%). Our findings are in agreement with those of Schirmer *et al*¹⁰ who reported higher complication and conversion rates as well as a longer hospital, stay for patients with previous upper abdominal surgery than for those without previous upper abdominal surgery.

In our patients in whom sufficient pneumoperitoneum and visibility were achieved, anatomic disruptions around the gallbladder were more frequent in patients with upper previous incisions. This situation may affect the rate of conversions to open surgery in these patients. In addition to incision type, particular indications for surgery such as trauma or complicated peptic ulcer disease can make operations difficult, resulting in more adhesions than in other operations such as cesarean section. In our study, previous perihepatic operations were particularly associated with conversion, considering that 2(50%) patients who had undergone surgery for hydatid cyst needed conversion.

In performed with a laparoscopic cholecystectomy, closed technique, during the placement of the first trocar there is a rare possibility of injury to large blood vessels. The most serious possibility is aortic injury.¹¹With these types of injury, death can occur even despite early intervention. As the aorta is a retroperitoneal structure, aortic injury can be attributed to patient and surgeon-related factors (thin patient, application of excessive force during trocar placement) rather than to intra-abdominal adhesions. Moreover, these complications may be

seen in patients with no history of previous operations.

We did not apply Hasson's technique in patients with Pfannenstiel or McBurney incisions during this study in (61.5%); however, we now prefer to use this technique in patients with these incisions, because of complications related from applying closed technique. The bile duct injury, which was observed in the upper and lower incision group, also cannot be attributed specifically to previous operations or incision type because several other factors may affect the occurrence of bile duct injuries.

CONCLUSIONS

We found that patients with previous lower abdominal incisions had fewer adhesions in the upper abdomen than did patients with upper or combined upper and lower incisions, and as a result had a much lower rate of complications and conversion to open cholecystectomy. Rarely, unintentional injuries to the intestines can occur, and therefore particular attention should be paid to this possibility during the dissection of adhesions. Previous abdominal operations, even in the upper abdomen, are not a contraindication to safe laparoscopic cholecystectomy. However, previous upper abdominal surgery is associated with an increased need for adhesiolysis, a higher open conversion rate, and a prolonged operating time.

RECOMMENDATIONS

1. Patients with previous upper abdominal surgery, who are scheduled to undergo laparoscopic cholecystectomy, should be informed preoperatively of the high conversion rates associated with these conditions.
2. Open method prefers to be used in patients with previous lower abdominal operations, to avoid risk of Veress needle insertion complications.
3. Patients with previous upper who are scheduled to undergo laparoscopic cholecystectomy should be done by well experienced surgeon to decrease risk of complications and conversion to open surgery.
4. Patients with previous upper abdominal operations, who are scheduled to undergo laparoscopic cholecystectomy, should insert first port in virgin area away from midline incision, like LUQ, Right iliac fossa, subcostal or Subxiphoid area.

REFERENCES

1. Yu, P.C., Chen, S.C. and Wang, S.M., *et al.* "Is previous abdominal surgery a contraindication to laparoscopic cholecystectomy?" *Journal of Laparoendoscopic Surgery*, 4.1 (1994): 31–35.
2. Blauer, K.L. & Collins, R.L. "The effect of intraperitoneal progesterone on postoperative adhesion formation in rabbits." *Fertility and Sterility*, 49.1 (1988): 144–149.
3. Binenbaum, S.J. & Goldfarb, M.A. "Inadvertent enterotomy in minimally invasive abdominal surgery." *JSLs*, 10.3 (2006): 336–340.
4. Ercan, M., Bostanci, B.E. and Ulas, M., *et al.* "Effects of previous abdominal surgery on complications and conversion rate in laparoscopic cholecystectomy." *Surgical Laparoscopy Endoscopy & Percutaneous Techniques*, 19.4 (2009): 373–377.
5. Mayol, J., Garcia-Aguilar, J., Ortiz-Oshiro, E., De-Diego Carmona, J.A. & Fernandez-Represa, J.A. "Risks of the minimal access approach for laparoscopic surgery: multivariate analysis of morbidity related to umbilical trocar insertion." *World Journal of Surgery*, 21.5 (1997): 529–533.
6. Goldstein, S.L., Matthews, B.D., Sing, R.F., Kercher, K.W. & Heniford, B.T. "Lateral approach to laparoscopic cholecystectomy in the previously operated abdomen." *Journal of Laparoendoscopic & Advanced Surgical Techniques*, 11.3 (2001): 183–186.
7. Kumar, S.S. "Laparoscopic cholecystectomy in the densely scarred abdomen." *American Surgeon*, 64.11 (1998): 1094–1096.
8. Patel, M. & Smart, D. "Laparoscopic cholecystectomy and previous abdominal surgery: A safe technique." *Australian and New Zealand Journal of Surgery*, 66.5 (1996): 309–311.
9. Karayiannakis, A.J., Polychronidis, A. and Perente, S., *et al.* "Laparoscopic cholecystectomy in patients with previous upper or lower abdominal surgery." *Surgical Endoscopy*, 18.1 (2004): 97–101.
10. Schirmer, B.D., Edge, S.B. and Dix, J., *et al.* "Laparoscopic cholecystectomy. Treatment of choice for symptomatic cholelithiasis." *Annals of Surgery*, 213.6 (1991): 665–677.
11. Alcazar, M.T., Ornaque, I. and Delgado, M.A., *et al.* "Abdominal aortic injury as a complication of laparoscopic cholecystectomy." *Revista Española de Anestesiología y Reanimación*, 51.8 (2004): 452–455.

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