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Research Article

Risk definition in Laparoscopic versus Open Cholecystectomy

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Abstract

Nothing without risk. As cholecystectomy is one of the most common procedures, any minor risk will be a mass volume .This study was to define the magnitude of that risk. In the study were 1486 patients between Feb. 2009 and April. 2018. Open in 292 (19.6%), 1194 (80.4%) laparoscopically, 1086 [91%] completed so and 108 (9%) converted. There were 18 (1.2%) with bile duct injury. 1 (0.3%) in the open group and 17 (1.4%) in the laparoscopic group. 9 diagnosed during surgery, 4 with jaundice, 2 early and 2 late, 5 with leak. Statistically the operative injury is insignificance in the 2 groups (P<0.3). The jaundice was significantly high in the laparoscopic group of patients (P<0.045). Also the bile leak (P<0.028). The same for morbidity (P<0.01. The revers was for mortality (P<0.04).

Conclusion: The incidence of CBD injury in the literature is less than the actual rate. Laparoscopic interventions have a higher rate of injury and the proximal ducts are at higher risk.

Introduction

Common bile duct injury may cause mortality as high as 5% [1]. Mostly not recognized during surgery. As gall bladder stones are very prevalent, and the number of interventions is massive, so even if the rate of injury is small the number at the end is big [2].

Now it is known that the laparoscopic approach is more risky with up to 15 fold increase in the risk [3,4]. The rate of injury is decreasing [5].

The proximal duct is at greater risk. Intra operative cholangiogram may be the only way to decrease the rate of injury [6]. There are many patterns for injury, the first is mistaking the common duct for the cystic, finally the distal duct clipped, the upper transected. In the second the distal clips are placed on common duct and the proximal on the cystic, ending with cystic t stump leak and distal duct obstruction. The third is tenting of the CBD; the result is the excision of the short segment of common duct with the cystic duct [7]. Right hepatic duct mistaken for the cystic [8].

Patients and Methods

Between February 2009 and April 2018, 1486 cholecystectomies were done for gall stones, none of them were acute. The main indications for open cholecystectomy were any contraindication for insufflation. 1285 were females, 201 were males with mean age of 52 with SD +-9.6 years.

Approval of the ethical committee is taken with a written consent from the patients.

The operative procedures

A - Laparoscopic cholecystectomy started by pneumoperitoneum with the use of veruss needle, introducing Co2 to peritoneal cavity with intraabdominal pressure at 12-14mmHg. Four trocars were used.

B - Open cholecystectomy through right paramedian incision or right subcostal incision.

C - We applied Strasburg scale classification for our injuries.

Statistical analysis

The data obtained were statistically analyzed using fisher's test to obtain the Z value and from the standardized table. The degree of probability is obtained [9].

Results

1486 cholecystectomies were operated upon. 292 (19.6%) were open, 1194 (80.4%) were laparoscopic of which 1086 (91%) completed laparoscopically, 108 (9%) converted (Table 1). Out of the 292 open, only 1 (0.3%) had common bile duct injury, during surgery (Table 2). Out of the 1086 laparoscopically completed, there were 4 (0.4%) complicated with with jaundice, two of them within 3 months. In the same group there were also 4 cases (0.4%) with leak (Table 3). In the converted, there were 8(7.4%) injury during surgery, and 1 case (0.9%) with bile leak (Table 4).

There were 8 cases (0.7%) of recognized intra-operative injury (R.I.O.I) among the 1194cases. The 4 cases of jaundice had an incidence of 0.35% in the Laparoscopic group (1194) that was 0.4% among those ended laparoscopically(1086) (Tables 3,5). The post operative bile leak was 5 (0.4%), four in the laparoscopic group (Table 3) and one in the converted group (Table 4).

There was one case of recognized intraoperative injury R.I.O.I in the open patients (0.3%), and the difference was non significant (P <0.3) (Table 6).

In respect to jaundice, 4 (0.35%) among laparoscopic patients, and no in the open (P<0.045) significant (Table 7).

The bile leak in the laparoscopic patient's was5 (0.4%) cases, no bile leak in the open patients. The difference (P<0.028) was statistically significant (Table 8).

The reported mortalities were two cases, one in each group, with a statistically significant difference (P<0.04) (Tables 9,10).

Table 1: Cholecystectomy approach.

CHOLECYSTECTOMY	OPEN	LAP	CONVERTED
1486	292 (19.6%)	1194 (80.4%)	108 (9%)

Table 2: Open cholecystectomy complications.

OPEN	Recognized intraoperative injury R.I.O.I.	POST OP JAUNDICE	POST OP Bile LEAK
292	1 (0.3%)	-	-

Table 3: Laparoscopically completed cholecystectomy complications.

LAP	Recognized intraoperative injury R.I.O.I.	POST OP JAUNDICE	POST OP Bile LEAK
1086	-	4 (0.4%)	4 (0.4%)

Table 4: Converted group complications.

CONVERTED	Recognized intraoperative injury R.I.O.I.	POST OP JAUNDICE	POST OPBile LEAK
108	8 (7.4%)	-	1 (0.9%)

Table 5: Laparoscopic cholecystectomy complications.

LAP	Recognized intraoperative injury R.I.O.I.	POST OP JAUNDICE	POST OP Bile LEAK
1194	8 (0.7%)	4 (0.35%)	5 (0.4%)

Table 6: Comparison of recognized intra-operative injury.

APPROACH	NO	Recognized intraoperative injury R.I.O.I	STATISTICS
Open	292	1 (0.3%)	Z = 1.05
Laparoscopic	1194	8 (0.7%)	P < 0.3 NS

Table 7: Comparison of post-operative jaundice.

APPROACH	NO	POST OP JAUNDICE	STATISTICS
Open	292	-	= 2.05
Laparoscopic	1194	4 (0.35%)	P < 0.045 S

Table 8: Comparison of post- operative leak.

APPROACH	NO	POST OP Bile LEAK	STATISTICS
Open	292	-	Z = 2.22
Laparoscopic	1194	5 (0.4%)	P < 0.028 S

Table 9: Morbidity significance.

APPROACH	NO	MORBIDITY	STATISTICS
Open	292	1 (0.3%)	Z = 2.75
Laparoscopic	1194	17 (1.4%)	P < 0.01 S

Table 10: Mortality significance.

APPROACH	NO	MORTALITY	STATISTICS
Open	292	1 (0.3%)	Z = 2.05
Laparoscopic	1194	1 (0.08%)	P < 0.04 S

Discussion

Technical difficulties or complications are the main causes of conversion [10]. In order not to miss injury a high awareness of its possibility is needed [11].

The mechanism of injury is different between open and laparoscopic. In the laparoscopic it is more proximal and extensive [12].

The patient may develop jaundice after an uneventful discharge from the hospital [13].

1486 cholecystectomy were in the study, 292 (19.6%) were open, 1194 (80.4%) initiated laparoscopically, then108 (9%) converted, these goes hand in hand with Buanes et al. [10], 20% open surgery 79.8% started laparoscopically, and 10.2% converted. Mostly open to guard against contraindication of insufflation, Pineres et al. [11]. Conversion is usually asking for the safety and to save time after no progression Tokumura et al. [8], and Giuliante et al. [12], who had conversion rate of 5.2% in patients with simple cases and 37.5% in patients with difficult cases.

The rate of injury account to 0.7% of patients subjected to gall bladder removal [13]. This incidence appear to be less than the actual rate. In our study 18 (1.2%) patients suffered injured, 1 (0.3%) in the open surgery, 17 (1.4%) during laparoscopic surgeries. In our work the general incidence was 1.2% while it was 0.7% in the series of Paczynski et al. [17], while its frequency was 0.2% to 0.4% with Mercado et al. [18]. In our work injury happened in 0.3% in the open surgery this goes hand in hand with Murr et al. [9], where their patients suffered from 0.2% to 0.4% injuries in the open interventions, in the same time their patients suffered from 0.5% to 0.8% injury laparoscopically while it was 1.4% in our work while it was 0.59% in the series of Mahatharadol [19], but Calvete el al. [5], got injury as high as 1.4%. In the stream is the work of Buanes et al. [14], who recorded 0.8% injuries after open while we got 0.3% .That is to say that the reported incidence in the literature [13], is less than the reported incidence in our work and in the work of others [5,9,14,17,19].

The 18 insult happened, 9 (50%) recognized on table 1 (3%) in open intervention and 8 (47%) in laparoscopic surgeries, this is in accordance with Mercado et al. [18]. With no significant difference (P<0.3). 4 cases (0.35%) of jaundice in the laparoscopic

group only with significant difference (P<0.045). Mentioning the leak, zero% in open, 0.4% in laparoscopic and 0.9% in converted with a statistically significant (P<0.028) difference, these is in contrast to Buanes et al. [14], who recorded 2.4% after open while in ours 0.4% also 4.2% after converted while in ours 0.9%. The morbidity was higher in laparoscopic intervention and was statistically (<0.01) significant, in contrary to mortality was higher in the open with significant difference (P<0.04), like that of Buanes et al. [14], who found it to be significant (0.01), in our work mortality took place 4 times more frequently after open operations while it is 10 times more with others [20,21].

Injury with associated leak may end with serious septic complication. Jaundice may be early or late therefore follow up is needed.

Conclusion

The incidence of CBD injury in the literature is less than the actual rate. Laparoscopic interventions have a higher rate of injury and the proximal ducts are at higher risk.

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