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Incidence of the Complications of Factors Predisposing to, and the rate of Conversion of Laparoscopic Cholecystectomy to Open Cholecystectomy

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Abstract

Introduction: *The first Laparoscopic cholecystectomy was performed by Erich Muhe in 1985 (Germany), followed by Mouret (1987 France)[1]. Laparoscopic cholecystectomy got accepted as a safe and better operation for G.B. stones in 1992 [2]. Laparoscopic cholecystectomy became popular in demand with time, because of its better cosmesis, minimal incisions, low morbidity and pain, short hospital stay, and recovery [3]. But it also had it's accompanying complications[5,14]. Thus many cases of Laparoscopic cholecystectomy were converted into a Laparotomy, when any of these complications developed.*

Methods: *Study of the incidence of complications, predisposing factors and the rate of conversion of Laparoscopic cholecystectomy into Open Laparotomy was done. 410 patients, who were put up for Laparoscopic cholecystectomy in Nalanda Medical College, Patna from March 14 - March 17 were observed.*

Results: *Randomized study of 410 patients of G.B. stones, put up for Laparoscopic cholecystectomy was done. Their median age was 40 yrs (range 16-64) and sex ratio was 403 F: 7 M. The common operative complications, their predisposing factors and the rate of conversion were observed.*

Conclusion: *410 patients of G.B. stones, after proper clinical evaluation, Lab investigations and cardiological check-up were put up for Laparoscopic. cholecystectomy. The most common and dreadful complication was Bile Duct injury (common bile duct/common hepatic duct). It's incidence was 2.7% (11 patients) [11,12,13]. The next common complication was internal bleeding (cystric artery/liver bed / hepatic artery / aberrant vessels), seen in 1.7% (7 patients) [14,15]. Injury to intestines, liver, major vessels, due to electrocautery accidents during adhesiolysis or introduction of Veress / trocar for ports, was 0.9% (4 patients) [16]. Leakage of Bile/Spilled stones was seen in 0.7% (3 patients)[17]. Cardiac arrhythmia or hypotension due to pneumoperitoneum was seen in 0.7% (3 patients).*

Keywords: *Laparoscopic cholecystectomy (Lap. Chole./LC), C.B.D, Cystic artery, Hepatic artery, Murphy's Sign, Gall stones, common Hepatic D.*

Introduction

Janos Veress invented the Veress needle in 1938 in Hungary to create peumothorax. Laparoscopes were gradually invented and technically improved and were initially used for gynecological operations. Muhe (1985) and Mouret 1987 did the first Laparoscopic cholecystectomy which was accepted worldwide in 1992, by the National Institutes of Health Consensus statement, as a safe surgical operation for patients of gall stones. With much smaller incisions, good cosmesis, minimal pain and morbidity, it was highly accepted[3]. Thus

Laparoscopic cholecystectomy became very popular by demand in G.B. stones patients.

Initially Laparoscopic cholecystectomy was done by 4 ports of 10 mm 10 mm 5 mm 5mm. The ports became narrower to 10 mm 5mm 2mm 2mm, which was called Mini Laparoscopic cholecystectomy, by Norvitsky et.al[6]. These days, single port access (SPA) or single Incision Laparoscopic surgery (SILS) are being done at numerous centers[7]. Advancement of electrocautery (unipolar/bipolar), Harmonics, Ligasure, robotic surgery are making Lap. chole more and more safe.

But Laparoscopic surgery also had its own associated complications which were encountered by surgeons. Thus while operating, a Laparoscopic surgeon should be more careful in patients who have any of these, below mentioned factors [8,9], predisposing to complications, namely

(1) Sex – Male (more common)

(2) Cholecystitis (Acute / Chronic) presenting as

i. Gangrene
ii. Pericholecystitic fluid collection
iii. G.B. Lump / Contracted G.B.
iv. Thick Walled (>4mm) G.B.
v. Murphy's sign +ve.

(3) Intra abdominal adhesions due to previous upper abdomen surgery.

(4) Infections with Neutrophilia

(5) General Diseases

i. Diabetes M. ii. Jaundice,iii. Hypoalbuminaemia.

The main complications of Laparoscopic cholecystectomy are

a. Bile Duct injury (C.B.D./ Common Hepatic Duct) : it results during adhesiolysis / dissection in Calot's triangle and in difficulty in exposing the cholecysto-cystic junction even after 30 mints [11,12,13].
b. Internal Bleeding (Cystic Artery, Liver bed, Hepatic artery, Aberrant artery): it results during dense adhesiolysis and dissection or non-recognition of aberrant vessels [14,15].
c. Injury to intestines, liver, stomach, vessels: accidental injury by electrocautery during adhesiolysis; introduction of Veress / Trocars in patients operated earlier[16].
d. Rare complications like Bile leakage spilled stones; pneumoperitoneum produced Arrhythmia / Hypotension were also seen.

The moment a complication is recognized, its prospects regarding correction is assessed. If negative, the operation should be converted into an Open cholecystectomy/ Laparotomy. Threshold of conversion in Laparoscopic surgery should be low, never high. Conversion should never be considered a complication or something disgraceful [9].

Patients and Methods

In the period March'14 to March'17, 410 patients who had undergone Laparoscopic cholecystectomy after proper clinical evaluation were observed. The different intraoperative complications, factors predisposing to these complications and the rate of conversion of Laparoscopic cholecystectomy into Open cholecystectomy was studied. Laparoscopic cholecystectomy was done through 4 ports of 10mm 10mm 5mm 5mm. The camera port was usually supraumbilical. Hasson's technique was not used. Drainage was done, when suspicion of future collection of bile/blood was there, by passing Nelaton catheter through 5mm anterior axillary port.

Results

In this study of 410 patients who went for Laparoscopic. cholecystectomy, the intra-operative complications, the predisposing clinical factors and the rate of conversion of Laparoscopic cholecystectomy into Open Laparotomy was observed.

A total of 28 patients developed complications, which were managed by laparoscopic techniques and manoeuvres; or by converting the operation into Open laparotomy. Bile duct injury (C.B.D./

Hepatic-D.), the most common complication, was seen in 2.7% (11 patients); Internal bleeding was seen in 1.9% (7 patients); Injury to intestines, liver, major blood vessel was seen in 0.97% (4 patients); leakage of bile/spilled stones 0.7% (3 patients); Cardiac arrhythmia / Hypotension due to pneumoperitoneum was seen in 0.7% (3 patients)

Table 1: Showing the incidence of different intra-operative complications of Laparoscopic cholecystectomy, in a total of 28 patients

Complications	No of Pts	% Incidence
Bile Duct injury (C.B.D./ Common Hepatic D.)	11	2.7%
Intrabdominal bleeding (Cystic artery Liver bed, Hepatic artery)	7	1.7%
Injury to Intestines/vessels	4	0.97%
Bile leakage/spilled stones	3	0.7%
Cardiac arrhythmia (Pneumo peritoneum)	3	0.7%

Amongst the associated clinical factors predisposing to the above complications, cholecystitis + pancreatitis, acute or chronic were the most common. Males had a much greater incidence of complications than females.

Complications	No of Pts	% Incidence
Acute cholecystitis + Pancreatitis with Pericholecystitic collection	10	35.7%
Chronic cholecystitis (Murphy's +ve, G.B. wall >4cm)	6	21.4%
Previous Operation upper abdomen	5	17.8%
General Diseases (D.M., Jaundice, Hypoalbuminaemia)	4	14.2%
Infection (Neutrophilia)	3	10.7%

Table -3 Sex Ratio of Incidence of complications (total 28 patients having complications)

Sex	No of Pts	Complication	% Incidence
Male	7	2	28.6%
Female	403	26	6.45 %

Discussion

This study led to the observation that in patients who have Laparoscopic Cholecystectomy, incidence of developing intra-operative complications was 6.8% (28 out of 410). This finding was close to the figure of 1.5% - 15% found by Sultan et.al[9].

Bile Duct injury was found to be the most common complication, with an incidence of 1.7% (11 patients). This figure tallied with the incidence of bile duct injury of 0.3 % - 2.7% found by the Southern Surgeon Club[15,16,18]. All of them needed conversion to Open cholecystectomy. Intraabdonominal bleeding, the next common complication, was seen with an incidence of 1.7% (7 patients). This rate was close to the mcidence of 0.3-1% found by Jatzko et. Al [18]. Visualisation and haemostasis of the bleeding vessel, electrocautery by spatula in the Iiver bed, managed this complication in (1 patient). Injury to intestines, liver, vessels was seen in 0.9% (4 patients). This rate was close to the rate of 1% found Jatzko et.al[18]. Bile leakage / stone spillage was managed by suction and Nelaton catheter drainage for 3 days and thus did not need conversion.

The rate of conversion for Laparoscopic cholecystectomy into Open Laparoscopicarotomy was 5.85% (24/410). This conversion ratio was close to the rate of 5%-10% in the study of The Southern Surgical club, and the international conversion rate of 1.5% - 15% (round about 5%) [8,9].

Conclusion

Bile duct Injuriy, the most common and dreadful complication of Laparoscopic cholecystectomy, may require conversion to Open Laparotomy. If needed, it should be done only by an experienced surgeon. Intra-operative bleeding can be managed by Open Laparotomy. Conversion of a Laparoscopic cholecystectomy into Open cholecystectomy / Laparotomy should not warrant any hesitation. The only question which should arise should be: When? Where? Who? [24].

Bile duct injury can be managed by repair on a T-tube, if the injury is minor[19]. If the injury is large, it can be managed by Endoscopic management like sphincterotomy and stenting[20,21]. Major injury of bile duct should be managed by Roux-en-Y choledocho-enterostomy [21,24].

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