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Original Research Article

Surgical morbidity and mortality in patients with calculus biliary tract diseases

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ABSTRACT

Background: In the era of laparoscopic cholecystectomy the discussion on morbidity and mortality of open cholecystectomy still holds importance and should not be considered obsolete. The values of good anaesthesia, good muscular relaxation, adequate operative exposure and adequate stretch on the CBD and careful anatomical dissection are very well known. The objective of the study was to study the surgical morbidity and mortality in patients with calculus biliary tract diseases.
Methods: The study included 839 patients with surgical jaundice and various surgical modalities applied as per the need and indication. 168 patients out of 839 were referred to Department of General Surgery for surgical management.
Results: The commonest surgical procedure carried out was cholecystectomy with CBD exploration in 102 (60.71%) patients. Only CBD stone was found in 79 (47.02%) patients. Total 43 (25.60%) incidence of post-operative complications were reported in the patients. Surgical wound infection (20, 11.90%) was the commonest post-operative complications, followed by chest infection (13, 7.74), and biliary leakage (4, 2.38%). Four (2.38%) deaths were reported among 168 cases.
Conclusions: Conventional surgeries like CBD exploration, choledochoduodenostomy (CDD), choledochojujenostomy (CDJ), transduodenal sphincteroplasty (TDS) can be associated with morbidity and mortality in spite of optimisation and excellent postoperative care.

Keywords: Biliary tract diseases, Cholelithiasis, Surgical approach, Complications

INTRODUCTION

Surgery for chronic cholecystitis and cholelithiasis and its complications has become the commonest abdominal operation as it has become much safe for the patient in recent years mainly because of better understanding of blood, fluid and electrolyte replacement, the use of antibiotics and improvements in anaesthesia.[1] In last 2 decades the operation has become more acceptable because of advent of laparoscopy which has made the procedure minimally invasive, scarless, least painful and allowed early return to work.[2] The studies have shown that advantages of laparoscopic cholecystectomy are obvious and compelling.[3-5]

Cholecystectomy in the hands of competent surgeon is associated with a minimum morbidity and an overall mortality rate of 0.1-2.5%; mortality being somewhat higher in older age groups.[6] The risks are increased when there is co-existent choledocholithiasis.[7] For patients with cholecystectomy alone the morbidity was 3.6% and for patients who had a concomitant CBDE the morbidity was 17% ($p<0.001$).[8] Laparoscopic cholecystectomy may even decrease the morbidity but the increased incidence

of common bile duct injury during learning curve is still a matter of concern in many studies.[9]

Cholelithiasis discovered at the time of operation for other intraabdominal conditions used to be a frequent problem 3 decades before. An important teaching of those days would be to palpate various viscera with hands to rule out any diseases which could be missed otherwise.[10] After the advent of imaging modalities like ultrasound, computed tomography, magnetic resonance imaging; this has become an orthodox teaching.[10] The fact remains that even though the laparoscopy has become the gold standard for cholecystectomy but still there are good number of conversions needed to open cholecystectomy even in expert hands at the time of frozen Calot's triangle, bad bleeding, anamoulous anatomies of messy empyemas.[11]

Thus, in the era of laparoscopic cholecystectomy the discussion on morbidity and mortality of open cholecystectomy still holds importance and should not be considered obsolete. The values of good anaesthesia, good muscular relaxation, adequate operative exposure and adequate stretch on the CBD and careful anatomical dissection is very well known.[12] Anatomical abnormalities of cystic duct & cystic artery are predisposing factors and surgeon ought to work with scientific logic rather than by faith to prevent operative injuries.[12] At times, in a messy empyema a cholecystostomy or a subtotal cholecystectomy means more surgical maturity and wisdom rather than a total cholecystectomy against all odds which may prove very unsafe for the patient.[13] Other causes of these injuries are haemorrhage from normal or abnormal cystic artery and blind attempts in a pool of blood to arrest the same by plunging a hemostat.[13] A combination of an easy cholecystectomy with an over confident surgeon lacking adequate technical skill constitutes a sinister combination.[14] Obesity is well recognized factor in increasing morbidly and mortality and for such patients, a carefully supervised programmes of weight reduction before an elective operation on the biliary tree shall reduce the risks involved. Further improvement in techniques of CBD exploration should be sought since a substantial number of deaths are directly related to the operative procedure and secondary exploration of the ducts for residual stones.[14]

With this background, present study was undertaken to explore surgical morbidity and mortality in patients with calculus biliary tract diseases.

METHODS

This was a prospective as well as a retrospective study conducted at Department of Surgery, Sher-i-Kashmir Institute of Medical Sciences Soura, Srinagar from January 2005 to December 2009. The study protocol was approved by Institutional Review Board, Sher-i-Kashmir Institute of Medical Sciences Soura, Srinagar. The written informed consent was obtained from patients before enrolling them into the study. The study included 839 patients with surgical jaundice and various surgical modalities applied as per the need and indication. 168 patients out of 839 were referred to Department of General Surgery for surgical management. 671 patients were dealt by Endoscopic Retrograde Cholangio-Pancreatography (ERCP). All patients were worked up as per the set protocol in the Department of Medical Gastroenterology and General Surgery. All patients were optimised before surgery and cleared by Department of Anaesthesia before surgery. Involvement of other specialities in the pre- or post-operative management was sought as per the morbidities associated. All complications intra- or post- operative were recorded. In patients with mortality again all records till death were entered in the case records and the cause of death was entered in their death certificate. The data were recorded in structured case record form. The data were analysed using Microsoft Office Excel. Data was expressed as absolute numbers with or without percentages, as means with standard deviation or as medians with ranges.

RESULTS

According to Figure 1, females (98, 58.33%) are predominantly undergone surgical procedure for suspected cases of chronic cholecystitis and cholelithiasis as compared to males (70, 41.67%). As per the Table 1, elderly patients are more affected as compared to younger patients. As the age advances, there is increase in the prevalence of biliary tract disease and hence prevalence of operative procedure is also increased.

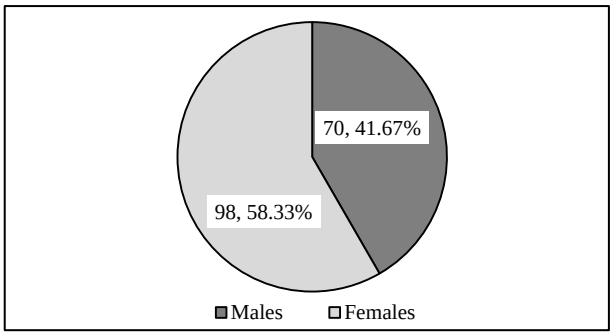

Figure 1: Distribution of the patients according to gender.

Table 1: Distribution of patients according to age (n=168).

Age (years)	No. of patients	Percentage (%)
15-25	10	5.95
25-35	12	7.14
35-45	16	9.52
45-55	35	20.83
55-65	38	22.62
>65	57	33.93
Total	168	100.00

Table 2: Type of surgery (n=168).

Type of surgery	No. of patients	%
Cholecystectomy with CBD exploration	102	60.71
Choledochoduodenostomy	26	15.48
CBD exploration	12	7.14
Cholecystectomy with Transduodenal sphincteroplasty	24	14.29
Cholecystectomy with hepaticojejunostomy	2	1.19
Cholecystojejunostomy	2	1.19
Total	168	100.00

In the present study, the commonest surgical procedure carried out was cholecystectomy with CBD exploration in 102 (60.71%) patients. The operative procedure included were choledochoduodenostomy (26, 15.48%), cholecystectomy with transduodenal sphincteroplasty (24, 14.29%), only CBD exploration (12, 7.14%), cholecystectomy with hepaticojejunostomy (2, 1.19%), and cholecystojejunostomy (2, 1.19%) (Table 2).

Table 3: Operative findings (n=168).

Operative findings	No. of patients	%
CBD stones	79	47.02
CBD stones + worms	36	21.43
Worms only	21	12.50
Hepatic stones	22	13.10
Biliary mud	8	4.76
Growth	2	1.19
Total	168	100.00

During operative procedure, only CBD stone was found in 79 (47.02%) patients, while CBD stones with worms; worms only; hepatic stones; biliary mud; and growth were found in 36 (21.43%); 21 (12.50%); 22 (13.10%); 8 (4.76%); and 2 (1.19%) patients, respectively (Table 3).

Table 4: Post-operative complications (n=168).

Complications	No. of patients	%
Primary haemorrhage	1	0.60
Biliary leakage	4	2.38
Surgical wound infection	20	11.90
Chest infection	13	7.74
Convulsions	1	0.60
Death	4	2.38
Total	43	25.60

Total 43 (25.60%) incidence of post-operative complications were reported in the patients. Surgical wound infection (20, 11.90%) was the commonest post-operative complications, followed by chest infection (13, 7.74), and biliary leakage (4, 2.38%). Four (2.38%) deaths were reported among 168 cases (Table 4).

DISCUSSION

In the present-day scenario this article might look a little outdated but the fact remains that even though the ERCP is the gold standard for CBD clearance but still some patients will need surgical intervention. The purpose of this publication is to make new generation of surgeons understand the importance of these time tested procedures which always in failed ERCP will come to their rescue.

Scoring systems can be used to classify patients according to their risk of having bile duct stones.[15] Low-risk patients have no symptoms and normal liver function tests. Intermediate-risk patients may have suffered previous acute pancreatitis, have a moderately dilated bile duct and/or a transient alteration in liver function tests. High-risk patients have jaundice, cholangitis or evidence of bile duct stones on ultrasound scan.[15] To reduce the number of negative ERCPs, the scoring threshold must be raised, thus leading to a higher incidence of intra-operative diagnosis of bile duct stones.[15] In the last few years, MRCP has gained popularity in the investigation of stones in the bile duct. It has the ideal characteristics of a convenient diagnostic tool, being minimally invasive with high specificity and sensitivity.[16] The use of MRCP together with a well-validated scoring system should optimise the use of more invasive or expensive diagnostic methods such as ERCP or MRCP alone.[17]

In our study group, cholecysectomy with choledochotomy was performed on 102 patients (60.71%); cholecysectomy with choledochoduo-denostomy (CDD) on 26 patients (15.47%), CBD exploration only in 12 patients (7.14%); cholecysectomy with transduodenal sphincteroplasty 24 patients (14.28%) and cholecystojejnostomy 2 patients (1.19%), two patients were having metastatic carcinoma at the lower end of CBD; cholecysectomy with hepaticjejmostomy was performed in 2 patients (1.19%). Once these percentages are considered in a total study group of 839 patients, then Our results are in agreement with that of Chrungoo et al.[18] For many years the procedure of cholecystectomy with T-tube drainage has offered an effective therapy and was associated with a morbidity rate of 10–15%, a mortality rate of <1% (in patients under 65 years) and a retained stone rate below 6%.[19] Hai, Singh reviewed the records of the 1492 cases with extrahepatic biliary surgery, out of total 1492, cholecystectomies performed during 1976-1982 period.[20] 152 patients required CBD exploration an incidence of 10.19%. The commonest indication (64.5%) was stones in CBD usually multiple and infective followed by malignant strictures (7.9%) of the CBD, the incidence of CBD strictures was relatively low. There were seven cases of sclerosing cholangitis. Per cuteness transhepatic cholangiogram was found to be simple and effective

investigative procedure were limited investigative facilities are available

However, none of the surgical procedure has 100% success rate. Meyer et al reported the incidence of residual/recurrent stones was 0.7% of all procedures and represented 2.20% of all common duct explorations.[21] Hai & Singh reported in incidence of 10.19% of CBD explorations for various series range from 18-29% with positive results varying from 28 to 60%.[20] Wani et al (1987) described a method of elimination of the stones remaining in the CBD after exploration of the duct.[22] The retained stones are flushed through the common duct splinter into duodenum using rapid infusion of the normal saline via T-tube. Five patients having residual calculi and one had a round worm in the CBD, were subjects to saline irrigation through t-tube.[22] Daniel and Eggeleston presented their experience of 44 patients in whom they performed choledochoduodenostomy in consecutive series of 44 patients and one mortality was reported. Choledochoduodenostomy was indicated in patients with primary CBD stones, CBD stones with strictures of the duct, pancreatitis, choledochal cyst and hydatid disease of CBD. They also suggested that it could not be carried only unless an anastomosis of 2.5 cm could be made.[23]

No consensus exists regarding the ideal management of gallbladder and CBD stones. CBD stones can be detected preoperatively, intraoperatively or postoperatively. Consequently, the management options are quite varied especially in the present era of advanced laparo-endoscopic techniques. The following management strategies are available: (i) endoscopic Sphincterotomy (EST) with stone extraction followed by laparoscopic cholecystectomy; (ii) simultaneous endoscopic stone extraction with laparoscopic cholecystectomy; (iii) combined laparoscopic cholecystectomy and CBD exploration (LCBDE); (iv) open CBD exploration; and (v) EST post cholecystectomy.[14]

Every procedure has its advantages and disadvantages and there is a broad overlap between the indications for an ideal management option in a particular clinical scenario

However, after creating new biliary drainage by means of CDD, CDJ or defunctioning the natural sphincter by papillotomy by endoscopic means, one should not underestimate the life time risk of cholangitis on follow up because of direct fouling of bile by enteric contents by reflux, hence in high propensity zones of round worms like Kashmir, worm can have always an easy access to biliary system and lead to frequent attacks of biliary ascariasis, thus making it imperative for the treating doctors to deworm these patients and regular intervals and increase their awareness about cholangitis to gift them with better quality of life.

Primary operations for gall stones are having a morbidity rate of up to 17%.[12] Much of the morbidity is caused by factors common to all surgical procedures. However, many complications following biliary tract surgery are unique to this type of surgery and have their origin in judgment of technical errors. In this present study of 168 operated patients complications were seen in 39 patients (23.21%). Wound infection was the most common complication seen in 20 patients (11.90%); second common was chest infection in 13 patients (7.73%); biliary leakage 4 patients (2.38%), primary haemorrhage 1 patient (0.59%) and convulsions one patient (0.59%). Our complications rate is almost matching or lower when compared with other studies. Chrungoo et al evaluated the correlation of various risk factors with postoperative morbidity in biliary tract surgery. In the 90 operated patients there was no mortality.[18] The morbidity rate was 40%. Margotia et al reports a morbidity ranging between 25-34% in elderly age group (70–96 years); mortality of 3% in emergency group and overall mortality of 6%.[24]

Primary operations for gall stones and biliary channels are common and have a mortality of less than one percent over all in patients under 50 years of age in cholecystectomy.[12] However, with the increased age and associated cholangitis, mortality increases. Four deaths were reported from our series of 168 cases (2.38%). Cause of death in two patients was septicemia and cardiopulmonary arrest (age in both cases was more than 60 years and was associated with cholangitis. In the third case, cause of death was disseminated intravascular coagulopathy with metabolic acidosis and in the fourth case, patient was under 50 years of age, subjected to cholecystectomy only and died of encephalitis due to septicemia). However, Meyer et al reported a mortality rate of 1.8% in his series of 1261 patients and Giovanni et al reported, the overall operative mortality for elective and emergency surgery was 1.5 percent.[21,25] Colcock and Perey reported 17 deaths in a series of 1756 cases giving a mortality of 1 percent.[26] In the group of 105 acute cholecystitis, 2 dies yielding a mortality rate of 1.9% and of 1651 with chronic cholecystistis 15 died a mortality rate of 0.9% of 447 cases having both cholecystectomy and choledochotomy 8 died, a rate of 1.8 percent, 56 having both cholecystectomy and sphinctroplasty, one died a rate of 2.0 percent. Our mortality is a little higher because of some sick and morbid patients in the series and the series is a little smaller which magnifies the impact of mortality.[26]

Biliary tract disease continues to be one of the commonest surgical intervention for general and hepatobiliary surgeons. The anomalous anatomy, the frequent attacks of cholecystitis, pancreatitis, cholangitis, Mirrizis syndrome, empyema make the job at times most challenging for the most experienced surgeons. Our main aim as surgeons should be to follow international guidelines in diagnosis, intra-operative management, playing safe at Calot's triangle and ultimately giving proper postoperative care for the better recovery and the ultimate safety of patients. As the famous metaphor goes that we can survive without four limbs but never without one CBD.

CONCLUSION

Conventional surgeries like CBD exploration, CDD, CDJ, TDS can be associated with morbidity and mortality in spite of optimisation and excellent postoperative care.

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