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Original Research Article

A study on laparoscopic cholecystectomy, indications, complications and conversion to open in a tertiary care hospital

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ABSTRACT

Background: Disease of gall bladder, especially the stones, is one of the most common health problems leading to surgical intervention. Laparoscopic cholecystectomy is the gold standard operation for gall stone disease with a good safety profile. The aim of the study was to discuss the indications, complications encountered and open conversion rate of laparoscopic cholecystectomy in a tertiary care hospital.
Methods: It was a prospective study, conducted at Sri Adichunchanagiri Hospital and Research Center, B.G. Nagara, Karnataka after the approval from institutional ethics committee (IEC). This study included 30 patients who presented to the ER or OPD with pain abdomen, from October 2018 to March 2019, and diagnosed to have gall stone disease with or without inflammation. All the patients were worked up as per standard institutional protocol. Patients clinical characteristics, ultrasonogram (USG) findings, surgical management and complications were recorded.
Results: Mean age was 41.1±6.06. The indications for cholecystectomy in gall stone disease at our institute during the aforementioned timeline were symptomatic gall stones (60%) and calculus cholecystitis (40%). All underwent laparoscopy and 2 patients were converted to open surgery intra-operatively in view of difficulty in dissection of Calot's triangle. 3 patients had post-operative complications and treated conservatively.
Conclusions: Laparoscopic cholecystectomy is a standardised, efficacious procedure for the treatment of gall stone disease whether symptomatic or infected. Complications are minimal but a thorough knowledge of open procedure is also essential in case of intra-operative conversion.

Keywords: Laparoscopic cholecystectomy, Open cholecystectomy, Gall stone disease, Symptomatic gall stones, Calculus cholecystitis

INTRODUCTION

Gall stone disease is in an increasing trend of prevalence worldwide. According to a study prevalence of gall stones in USA is about 15%, in Europe it is ranging from 9-21% and in India it ranges between 6-9%.[1,2]

Because of this there have been numerous medical and surgical managements employed for their management at various institutions. But the one surgery which has been consistent and reliable is the laparoscopic cholecystectomy from 1980s.[3] This is the reason there have been numerous studies which depicted the technique, anatomical variations and complications of this procedure.[3-5] Indications of laparoscopic approach has now encompassed almost all pathologies associated with the gall bladder.[6,7]

Despite so much research in the era of laparoscopy, there are still cases where one has to covert to open approach because of various reasons and the incidence is still around 5-10%.[8]

So this study was undertaken to assess the indications, complications and open conversion rate of laparoscopic cholecystectomy in a tertiary health care centre and discuss the issues encountered.

METHODS

It was a prospective study, conducted at Sri Adichunchanagiri Hospital and Research Center, B.G. Nagara, Karnataka. This study included patients who presented to ER or surgery OPD diagnosed with gall stone disease from October 2018 to March 2019. Duration of the study was 6 months. A total of 30 patients were studied over this duration after the approval from Institutional Ethics committee.

Patients presenting with pain abdomen, diagnosed as having symptomatic gall stones or acute/ chronic calculus cholecystitis were included in this study.

Patients with acalculus cholecystitis, other gall bladder pathologies, cholecystectomy as a part of other surgeries, common bile duct pathologies and those indications which needed open surgery as the primary modality were excluded from this study.

Patients who were willing to participate and sign the informed consent were enrolled in the study. All relevant medical history, drug usage and past surgical history was recorded in a proforma.

Blood investigations (complete blood count, liver function tests) and ultrasonography of abdomen was done as per standard protocol. Gall bladder wall thickness, number and size of gall stones, peri-cholecystic collection, common bile duct dilatation, intra-hepatic biliary radical dilatation and pancreatic pathology were looked for.

All cases of acute cholecystitis were treated with a 5 day course of broad spectrum antibiotics and were discharged. They were called after 6 weeks for interval cholecystectomy.

All cases of suspected symptomatic cholelithiasis underwent oesophago-gastroduodenoscopy (OGD scopy) to rule out peptic ulcer disease.

All patients underwent routine pre-anaesthetic evaluation and relevant investigations.

All cases were operated by the same operating team.

Laparoscopic cholecystectomy with Calot's first approach was the initial modality of treatment employed in all.

All the data obtained was processed using SPSS software.

RESULTS

30 patients were studied of whom 24 were female and 6 were male.

Mean age of presentation was 41.1±6.06 (Table 1). Youngest being 29 years old and the oldest to be operated in this study was 55 years.

Table 1: Age wise distribution of patients posted for cholecystectomy.

Age group (in years)	Number of patients
<40	11
40-50	17
>50	2

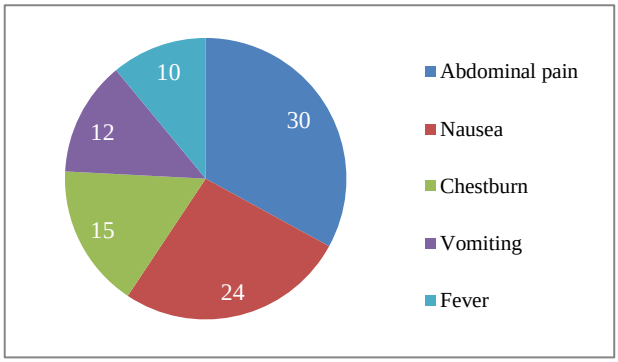

Figure 1: Symptoms with which the patients presented to hospital.

All patients had upper abdominal pain as a common presenting symptom. Fever was the least frequent complaint. Other symptoms were nausea, vomiting, chest burn and abdominal bloating sensation with varying intensity and frequency (Figure 1). Murphy's sign was positive in 4 patients with acute presentation and 3 with chronic cholecystitis.

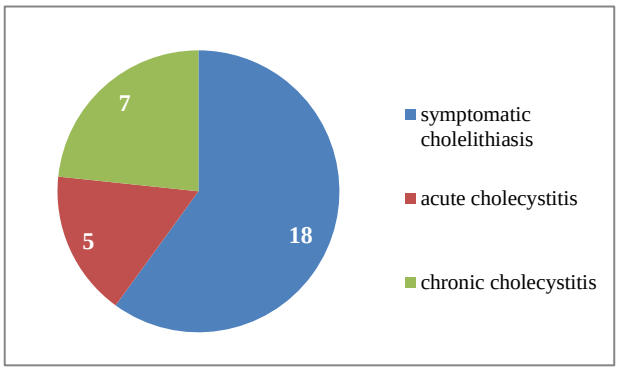

Figure 2: Indications for laparoscopic cholecystectomy in this study.

Among several patients who were investigated, eighteen patients (60%) had confirmed symptomatic cholelithiasis after OGD scopy, 5 (16.7%) had acute cholecystitis and 7

(23.3%) had chronic cholecystitis as confirmed by their clinical presentation, blood investigations and USG (Figure 2).

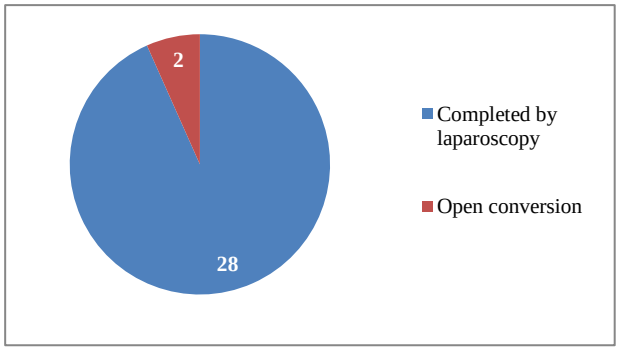

Figure 3: Successful completion of laparoscopic cholecystectomy vs conversion to open surgery.

All patients underwent laparoscopy initially and 28 (93.33%) had successful laparoscopic cholecystectomy and 2 (6.67%) were converted to open surgery intra-operatively (Figure 3).

No specific unusual structural variations were noted in the anatomy of cystic artery, cystic duct or Calot's triangle. 5 patients with chronic cholecystitis and 3 with acute cholecystitis who underwent elective cholecystectomy had minimal omental adhesions. Most of them could be removed with cautery but 2 cases needed conversion to open. No patient had any significant intra-operative complication so no drains were placed in laparoscopic or open surgery. Recovery from anaesthesia was uneventful.

Most of the patients (90%) were discharged on post op day 1 (Table 2). Stay beyond 1 day was either because of complications or open conversion.

Table 2: Post operative hospital stay–duration, technique and number.

Duration of stay post op	Surgical technique	No. of patients
1 day	Laparoscopic cholecystectomy	27
3 days	Laparoscopic cholecystectomy	1
4 days	Laparoscopic cholecystectomy	1
5 days	Conversion to open	1
8 days	Conversion to open	1

Three had complications post operatively. 2 patients developed surgical site infection (1 open and 1 lap) and were managed with local wound care and antibiotics. One had a serous collection at umbilical port site which was drained (Table 3). The open surgery with surgical site infection had the longest hospital stay of 8 days post operatively. Port site seroma patient was sent home on 3rd post-op day whereas umbilical port site infection patient was discharged on 4th day postoperatively.

Table 3: Post cholecystectomy complications.

Type of surgery	Complication encountered	No. of patients	Management done
Laparoscopic cholecystectomy	Port site seroma	1	Drainage
Laparoscopic cholecystectomy	Umbilical port site infection	1	Local wound care and antibiotics
Conversion to open	Surgical site infection	1	Local wound care and antibiotics

DISCUSSION

Gall stone disease is a highly prevalent entity and is more common in women compared to men.[1] The saying of fertile, forty, fatty female as the risk factor for gall stones though now not a specific entity, still persists and to some extent is applicable in this study because most of the patients studied were female with age around 40 years (Mean 41.1). BMI was also on higher side (>25 kg/m^2) in most of them.

Though there are numerous gall bladder pathologies for which surgery is required symptomatic gall stones and calculus cholecystitis remain the most common indications worldwide.[6,7]

Though there is a debate as to the timing of cholecystectomy in acute cholecystitis, for standardisation, only interval cholecystectomy was done in the study group.

All cases of gall stones without evidence of infection/inflammation, with symptoms were thoroughly investigated to rule out other causes of symptoms like peptic ulcer disease and gastro-esophageal reflux disease, before proceeding for cholecystectomy.

Standard four port technique was employed for laparoscopic approach. In the 2 cases which needed conversion to open surgery (one was chronic cholecystitis and other acute case with interval procedure), right subcostal incision joining the upper 2 ports was given and dissection done. Fundus first approach was used here. The indication for conversion to open was difficulty in dissection of Calot's triangle in both the cases.

Peri-operative period was uneventful and most patients were discharged on post op day 2. Only open cholecystectomy patients and those with post-operative complications stayed longer.

The reason for surgical site infection was probable spillage of gall bladder contents while extraction.

No patients in the study group needed further surgical management except drainage for a seroma.

In a study by Sakpal et al, where over a 52-month period, 2284 patients who underwent cholecystectomy were evaluated. Among patients undergoing cholecystectomy, laparoscopic cholecystectomy (LC) was attempted in 2205 (96.5%) patients, and primary open cholecystectomy (OC) was performed in 79 (3.5%) patients. Of the 2205 attempted LCs, 2096 (95.1%) were completed successfully, and 109 (4.9%) were converted to the open procedure. An average of 441 LCs were attempted annually with the greatest number (n=515) performed in 2006. The annual rate of attempted LCs ranged from 94.8% (457 of 482 total cholecystectomies in 2005) to 97.4% (446 of 458 total cholecystectomies in 2007) (P<0.06). The annual conversion rate ranged from 3.7% (19 of 515 attempted LCs in 2006) to 7.2% (33 of 457 attempted LCs in 2005) (p<0.02). The conversion rate in the study by Sakpal et al was comparable (6.67%) to the present study.[8]

Similarly in a study by Genc et al, 5164 patients were included. The overall rate of conversion to open cholecystectomy was 3.16% (163 patients). There were 84 male and 79 female patients; the mean age was 52.04 years (range: 26–85). The conversion rates in male and female patients were 5.6% and 2.2%, respectively (p<0.001). The most common reasons for conversion were severe adhesions caused by tissue inflammation (97 patients) and fibrosis of Calot's triangle (12 patients). The overall postoperative morbidity rate was found to be 16.3% in patients who were converted to open surgery which included suppuration at the umbilical trocar site in 2 cases, intraabdominal abscess in 1 case, atelectasis in 4 cases, incisional hernia in 2 cases, and deep venous thrombosis in 1 case.[9]

The need for open conversion in the present study correlates with the reasons mentioned in the above study by Genc et al.[9] However conversion rate in the present study is a bit higher probably owing to the less number of cases operated upon compared to Genc et al study and their's being a high volume centre. But overall complication rate in the present study was less (10%) compared to them.[9]

Regarding hospital stay postoperatively in a study by Jae Chong et al where 336 patients underwent LC under elective and emergency basis 225 patients stayed for less than 2 days where as 111 patients stayed for more than 2 days, shortest stay being one day and the longest 18 days. In their study the factors increasing the post-op hospital stay were previous abdominal surgeries, prolonged operative time, peri-operative blood transfusions, emergency operation, acute inflammation and surgical site infection.[10]

Though many if these factors were not evaluated or correlated in our study and as all the surgeries done in the present study were performed on elective basis a clear comparision can't be made between these two studies, however the main factors responsible for prolonged hospital stay in our study were conversion to open and post-op complications.

The present study thus gives an overall idea about the common diagnoses which lead to operative removal of gall bladder, the complications encountered and the reasons for conversion to open along with the technique employed and also we have compared our findings with few other studies for an understanding of the procedural and outcome variations in other centres.

CONCLUSION

This study further supports the routine laparoscopic approach for gall stone disease. It shows the common presentation and diagnosis which indicate cholecystectomy. This study showed the routine protocol followed for cholelothiasis and its management. Also it subtly stresses upon the importance of knowing open procedure also in case conversion to open in needed because of any untoward intra-operative difficulties.

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