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A RESEARCH STUDY OF CHOLECYSTECTOMIES AND REASONS OF CONVERSION OF LAPAROSCOPIC TO OPEN CHOLECYSTECTOMIES IN A TERTIARY CARE HOSPITAL

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ABSTRACT
Cholelithiasis involves the presence of gallstones which are concretions that form in the biliary tract, usually in the gallbladder. Treatment of gallstones depends on the stage of disease. By using the following diagnostic methods, the condition can be identified. Laparoscopic Cholecystectomy (LC) - The surgery to remove the gallbladder is called a cholecystectomy. Open Cholecystectomy (OC) - The gallbladder is removed through an incision on the right side under the ribcage. The reasons include difficult dissection, operative findings and surgery. Our study conducted in subjects admitted with diagnosis of cholelithiasis, who subsequently underwent cholecystectomy at Department of General Surgery Rajiv Gandhi Institute of Medical Sciences in study period between Jan 2011 and Dec 2015. This is a prospective descriptive analytical single centre research study and in this all the cases of gall bladder diseases admitted in surgery department undergoing cholecystectomy were studied, diagnosed and treated with surgical management (Laparoscopic or Open) during the period of 5 years and 196 cases were studied. The results shown that the high incidence in the age group of 40-50 years have undergone the surgery and predominantly females compared to males due to a large extent owing to ovarian hormones. The type of cholecystectomy performed more is laparoscopic (66.32%) due to few benefits over open-type surgery (21.93%) and with the conversion rate (11.73%). The conversion of LC to OC is due to the reasons like complications, difficult dissection and the operative finding associated with pathology. The main reasons for conversions are disturbed anatomy at Calot's triangle (34.78%) and bleeding from GB bed (21.73%). Finally concluding the study LC has emerged as the gold standard in the treatment of gall stones. LC has less pain after surgery, and has a shorter hospital stay and a shorter recovery time so it is preferred over OC. The overall frequency of conversion of LC to OC was 11.79%; the risk of conversion is more during the learning curve and in male patients, but increasing age is not associated with increased risk of conversion. Although unclear anatomy at Calot's triangle and bleeding from GB bed remain the most common reasons for conversion, the use of refurbished equipments was also a cause of concern.

KEYWORD: Laparoscopic Cholecystectomy (LC) and Open Cholecystectomy (OC).

INTRODUCTION
Cholelithiasis is the formation of gallstones which are concretions that are formed in the biliary tract, usually in the gallbladder. Treatment of gallstones depends on the stage of disease of patient[1]. The signs and symptoms include sporadic and unpredictable episodes, pain that is localized to the epigastrium or right hypochondrium, sometimes radiating to the right scapular tip, nausea, and vomiting.[2] The presence of persistent tachycardia, fever, hypotension, or jaundice necessitates a search for complications, which may include the following: Cholecystitis, Cholangitis, Pancreatitis.

By using the following diagnostic methods, the condition can be identified[3]. Abdominal radiography (upright and supine), Ultrasonography, Endoscopic ultrasonography (EUS), Laparoscopic ultrasonography, Computed tomography (CT), Magnetic resonance imaging (MRI), Scintigraphy, Endoscopic retrograde cholangiopancreatography (ERCP), Percutaneous transhepatic cholangiography (PTC).

The treatment of gallstones depends upon the stage of disease, as follows:

- **Lithogenic state** – Interventions are currently limited to a few special circumstances

- **Asymptomatic gallstones** – Expectant management
- **Symptomatic gallstones** – Usually, definitive surgical intervention (eg, cholecystectomy), though medical dissolution may be considered in some cases.

Medical treatments, used individually or in combination, include the following: Oral bile salt therapy (ursodeoxycholic acid), extracorporeal shockwave lithotripsy.[2]

Patients with the following risk factors for complications of gallstones may be offered **elective cholecystectomy**, even if they have asymptomatic gallstones like Cirrhosis, Portal hypertension, Children, Transplant candidates, Diabetes with minor symptoms.

Surgical interventions to be considered include the following:

- Cholecystectomy – Laparoscopic
- Cholecystostomy – Open

Laparoscopic Cholecystectomy

The surgery to remove the gallbladder is called a cholecystectomy. The gallbladder is removed through a 5 to 8 inch long incision, or cut, in abdomen. A less invasive way to remove the gallbladder is called laparoscopic cholecystectomy[4]. This surgery uses a laparoscope (an instrument used to see the inside of the body) to remove the gallbladder. It is performed through several small incisions rather than through one large incision, usually 3 incisicons, each one inch or less in length.

Although laparoscopic cholecystectomy was originally reserved for young and thin patients, it now is also offered to elderly and obese patients; in fact, these latter patients may benefit even more from surgery through small incisions.[4] Additional reasons to consider prophylactic laparoscopic cholecystectomy include Calculi greater than 3 cm in diameter, particularly in individuals in geographic regions with a high prevalence of gallbladder cancer, Chronically obliterated cystic duct, Nonfunctioning gallbladder, Calcified (porcelain) gallbladder, Gallbladder polyp larger than 10 mm or showing a rapid increase in size, Gallbladder trauma , Anomalous junction of the pancreatic and biliary ducts.[5]

Open Cholecystectomy

The gallbladder is removed through an incision on the right side under the ribcage. Indications for cholecystectomy either open or laparoscopic, are usually related to symptomatic gallstones or complications related to gallstones.[1] The most common of these indications are Biliary colic, Biliary pancreatitis, Cholecystitis, Choledocholithiasis and other indications include biliary dyskinesia, gallbladder cancer, and (controversially) prophylactic cholecystectomy during various intra-abdominal procedures.

Benefits of Laproscopy over Open Cholecystectomic surgery

With laparoscopic cholecystectomy, patient may return to work sooner, have less pain after surgery, and have a shorter hospital stay and a shorter recovery time. Surgery to remove the gallbladder with a laparoscope does not require that the muscles of your abdomen be cut, as they are in open surgery. The incision is much smaller, which makes recovery go quicker.

With laparoscopic cholecystectomy, The patient probably will only have to stay in the hospital for a few hours or overnight. With open cholecystectomy, the patient would have to stay in the hospital for about five days. Because the incisions are smaller with laparoscopic cholecystectomy, there isn't as much pain after this operation as after open cholecystectomy.[3]

Reasons for conversion of Laparoscopic to open Cholecystectomy

The reasons include difficult dissection due to dense adhesions between GB and bowel,disturbed anatomy at Calot's triangle; operative findings (associated pathology) include choledocholithiasis, biliodigestive fistula, surgery complications include severe inflammation, obscure anatomy and retraction difficulty, bleeding from GB bed bleeding from the cystic artery injury, duodenal perforation, colonic injury and wide cystic duct.[3]

MATERIALS AND METHODS

The study subjects were patients, admitted with diagnosis of cholelithiasis, who subsequently underwent cholecystectomy at Department of General Surgery Rajiv Gandhi Institute of Medical Sciences, Kadapa, AP in study period of 5 years between Jan 2011 and Dec 2015.

All the patients were interviewed for detailed clinical history and examined. They were then subjected to routine blood, urine and other investigations as per protocol and an abdominal ultrasound were performed in all cases.

Inclusion criteria

1. Patients presenting with at least one episode of right upper quadrant pain or epigastric pain (typical biliary colic) with ultrasonographically proven cholelithiasis.
2. Patients considered otherwise fit for elective cholecystectomy under general anaesthesia.
3. Patients willing to participate in our study.

Exclusion criteria

1. History or laboratory tests suggesting presence of common bile duct stones.
2. History of prior abdominal surgery.
3. Patients having a calculus cholecystitis.
4. Patients not willing to participate in our study.

A written informed consent was taken from all patients before their inclusion in the study.

METHODOLOGY

This is a prospective descriptive analytical single centre research study. In this study all the cases of gall bladder diseases admitted in surgery department undergoing cholecystectomy were studied, diagnosed and treated with surgical management (Laparoscopic or Open) during the period of 5 years and 196 cases were studied.

A thorough record of patients' data was performed, including the history and clinical examination, laboratory

investigations, ultrasound abdomen, x-ray chest and other imaging study , operative details, histopathology report, postoperative course. The variables noted and analyzed included: the demographic data, presenting complaint, previous history of jaundice or abdominal surgery, associated medical disease, abdominal tenderness, WBC count, LFTs, abdominal ultrasound, operative details, complications (peroperative or postoperative), histopathology report, postoperative course and follow-ups.

RESULTS AND DISCUSSION

Gender wise distribution

The females are more affected with cholelithiasis compared to males was observed in our study for a period of 5 years. More women than men have cholesterol gallstones. This probably to a large extent owing to ovarian hormones. Our preliminary studies suggest that the biliary lipid composition and gallbladder function may be abnormal.

Table: 1 Gender wise distribution

Gender	2011	2012	2013	2014	2015
Male	12	18	22	16	17
Female	27	17	20	20	27

Age wise distribution

In our study the occurrence of cholelithiasis (gall stones) were observed in varies of age groups and observed that the high incidence in the age group of 40-50 years.

Table: 2 Age wise distribution

Age group	2011	2012	2013	2014	2015
11 – 20	1	3	2	3	4
21 – 30	6	2	4	1	2
31 – 40	15	19	23	13	17
41 – 50	13	7	6	16	13
51 – 60	3	2	5	1	5
61 - 70	1	2	2	2	3
Total	39	35	42	36	44

Distribution based on number and type of surgeries

According to our study laparoscopic cholecystectomy was performed more compared to the open-type cholecystectomy for few reasons like less pain over site of surgery, decrease in hospital stay and shorter recovery time for patients. In few patients the conversion of Laparoscopic to Open Cholecystectomy occurred due to complications faced during the time of surgery.[3] (The complications and other reasons are discussed below in Table:5).

Table: 3 Distribution based on number and type of surgeries

Type of surgery	2011	2012	2013	2014	2015
Laparoscopic Cholecystectomy	26	24	30	22	28
Open Cholecystectomy	8	8	8	9	10
Conversion of Laparoscopic to Open Cholecystectomy	5	3	4	5	6

Distribution based on percentage of surgeries done

In our study we observed that the percentage of LC surgeries (66.32%) performed more compared to OC (21.93%). The conversion of Laparoscopic to Open Cholecystectomy is 11.73%.

Table: 4 Distribution based on percentage of surgeries done

Type of surgery	Number of surgeries done	Percentage
Laparoscopic Cholecystectomy	130	66.32%
Open Cholecystectomy	43	21.93%
Conversion of LC to OC	23	11.73%

Reasons for conversion of laparoscopic to open cholecystectomy

The conversion of LC to OC is due to the reasons like complications, difficult dissection and the operative finding associated with pathology. The main reasons for conversions are Disturbed anatomy at Calot's triangle (34.78%) and bleeding from GB bed (21.73%).

Table: 5 Reasons for conversion of laparoscopic to open cholecystectomy

Reason for conversion		Number of cases (n= 23)	Percentge
Complications	Bleeding from GB bed	5	21.73%
	Bleeding from cystic artery injury	3	13.04%
	Duodenal perforation	1	4.34%
	Colonic injury	0	0%
Difficult dissection	Disturbed anatomy at Calot's triangle	8	33.78%
	Dense adhesions between GB & bowel	3	13.04%
Operative finding (associated pathology)	Choledocholithiasis	2	8.6%
	Biliodigestive fistula	1	4.30%

CONCLUSION

Laparoscopic Cholecystectomy has emerged as the gold standard in the treatment of gall stones. Though it is easier to teach and learn the laparoscopic surgery with the help of magnified visual display, specialized training is a must in case of the laparoscopic technique. The females are more prone to GB stones than males due to a large extent owing to ovarian hormones. LC has less pain after surgery, and has a shorter hospital stay and a shorter recovery time so it is preferred over OC.

The overall frequency of conversion of LC to OC was 11.73%; the risk of conversion is more during the learning curve and in male patients, but increasing age is not associated with increased risk of conversion. Although unclear anatomy at Calot's triangle and bleeding from GB bed remain the most common reasons for conversion, the use of refurbished equipments was also a cause of concern. From our study the occurrence of cholelithiasis (gall stones) were observed in varies of age groups and observed that the high incidence in the age group of 40-50 years.

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