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A Comprehensive Study of Gall Stone Disease

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Abstract:
Introduction: *Gallstones are among the most common gastrointestinal illness requiring hospitalization. The prevalence of gallstones is related to many factors, including age, gender and ethnic background. Gallstone disease which was mainly confined to western world is increasingly becoming prevalent in developing countries as well. This is attributed to the changing dietary habits which are becoming westernized. In India, it is 7 times more common in north India as compared to south India.*
Aims/Objectives: *This study intends to know the age and sex incidence, various modes of presentation and biochemical analysis of gallstones in thickened gall bladder [5mm or >5mm]*
Method: *This is a prospective study in which a total 50 patients who presented with clinical features of calculous cholecystitis to Yenepoya medical college and hospital were investigated with ultrasound to confirm the diagnosis of calculous cholecystitis and hence were included in the study. Their demographic data, symptomatology and associated illness were documented. All were subjected to Laparoscopic cholecystectomy, the gallbladder was sent for histopathological examination, bile for culture and sensitivity and gallstones for biochemical analysis.*
Results: *The highest age incidence of calculous cholecystitis was found in 3rd and 4th decade. There was an increased incidence in females with M: F ratio being 1:2. Pain was the most common symptom. Tenderness in Right Hypochondrium was the most common sign. There was radiation of pain to the back in most of the patients. 96 % of patients had mixed diet. Ultrasonography was the investigation of choice in our hospital. All the patients underwent Laparoscopic Cholecystectomy. Histopathology revealed chronic cholecystitis in majority of the cases in this study. Bile culture showed no growth in the cases in this study. Gall stone analysis showed Pigment stones in 90 % of the cases.*
Conclusion: *The results showed higher incidence of calculous cholecystitis among females who presented most commonly with pain abdomen. Laparoscopic cholecystectomy is gold standard for the management of gallstone disease and it reduces the number of hospital days and was associated with lesser postoperative morbidity. Histopathology showed chronic cholecystitis in majority of the patients and pigment stones were the most common type.*
Keywords*: cholecystectomy, cholelithiasis, gall stones, cholecystitis*

I. Introduction

Gall stone disease is a very common gastrointestinal disorder, present commonly in the western world[1]. 10% of the adult patients have asymptomatic gall stones.[2]

At least 20 million Americans (12% of adults) have gallstones. The prevalence of gallstones appears to be rising, and every year roughly one million new cases are revealed. In India, it is estimated to be around 4% and is 7 times more common in northern India than in the southern states.[3]

Cholecystitis is defined as a chemical or bacterial inflammation of the gallbladder and is one of the commonest biliary pathologies. The etiology of cholecystitis is multifactorial. Stasis of bile within the gallbladder with consequent maintenance of contact between stagnant bile and the gallbladder wall resulting in chemical irritation is considered as one of the causes of cholecystitis. A bacterial source of cholecystitis has already been proposed with affirmative bile cultures seen in as many as 35-40 % of cases. The incidence of cholecystitis is much higher in females, with female to male ratio 3:1 up to the age of 50 years & a ratio of approximately 1.5:1 subsequently[5] .

Gallstones found in the gallbladder are classified based on their chemical composition as cholesterol, pigmented or mixed stones, Up to 90 percent of gallstones are cholesterol (> 50 percent cholesterol) or mixed (20 - 50 percent cholesterol) gallstones. The remaining 10 percent of gallstones are pigmented stones having less than 20 percent cholesterol.[6]

The simple mechanism which leads to the formation of gallstones is supersaturation, of constituents in bile surpassing their maximum solubilities[7] Mixed and pigment gallstones stones are very common in southern part of India whereas cholesterol gallstones in northern part of India.[9]

Approximately 75 percent of patients with symptomatic gallstone disease request medical attention because of episodic pain in the abdomen. The syndrome of biliary colic is mainly caused by the intermittent obstruction of cystic duct due to gallstones.[10]

The management of calculous cholecystitis comprises either nonsurgical therapies or surgical modality. The nonsurgical method mainly comprises of dissolution of gallstones with bile salts, which includes: (ESWL) extracorporeal shock wave lithotripsy and invasive contact dissolution with organic solvents. The surgical modality mainly comprises elective cholecystectomy, either open (standard approach) or, alternatively laparoscopic cholecystectomy. Several studies have testified that elective cholecystectomy for chronic calculous cholecystitis can be performed with almost zero mortality of 1 percent only.

The introduction of laparoscopic Cholecystectomy is making a dramatic impact on the management of symptomatic patients with gallstones. An estimated 700,000 cholecystectomies are performed for gallstone disease each year. In addition, complications of gallstones result in 3000 deaths (0.12% of all deaths) every year.[3] Laparoscopic cholecystectomy (LC) has gradually replaced open cholecystectomy (OC) in the treatment of symptomatic gall stone disease. Better cosmetic results, short hospital stay, early recovery and return to physical activity and work have all contributed to the popularity of this technique, establishing it as the gold standard for the treatment of cholelithiasis.[11,12,13]

The present study aims to look at the demographics, surgical outcome, operative morbidity and the pathology of removed gallbladder of calculous cholecystitis in the local population admitted to Yenepoya medical college and hospital.

II. Materials And Methods:

This is a prospective study. 50 patients with calculous cholecystitis were included in the study. The following inclusion and exclusion criteria were applied before including patients into the study:

Inclusion Criteria:

1. All cases diagnosed as Calculous Cholecystitis with ultrasound finding of thickened gallbladder (≥5 mm)

Exclusion Criteria:

1. Patients with medical comorbidites
2. Asymptomatic gallstones
3. Tender lump in right hypochondrium
4. Dilated CBD or CBD stones

Detailed history of all the 50 cases was taken according to the Performa. Information regarding the age, religion, socio economic status, nature of the symptoms, duration of the symptoms, past history of similar complaints, diet history, Alcohol intake, diabetes and other co-morbid conditions were obtained.

All patients were investigated with Haemogram, Blood sugar, Blood urea, Serum Creatinine, LFT, ECG, Urine analysis, Blood group, Chest x-ray, Ultrasound scan of the abdomen. Risk and complications of the condition as well as the types of surgical options available and their benefits and complications were explained to the patients, and consent was taken. All the patients underwent laparoscopic cholecystectomy. Preoperative dose of antibiotic was given. After opening the abdomen the pathological features and anatomical variations were noted and documented, bile was obtained from the gallbladder with a syringe and sent for culture sensitivity.

The gallstones were sent for chemical analysis and the gallbladder for histopathological examination. All the patients received antibiotics and routine post operative care. Patients were monitored in the post operative period to note the development of any complications. Suitable treatment was given according to the need.

III. Results

This study includes a total of 50 cases that were studied prospectively over a period of 24 Months. Results of our study are as follows:

1. Incidence According To Age :

In this study of 50 patients, youngest patient was a 15 years old female and oldest patient was a 72 years old male. Majority of the cases were noted in the age group of 31 to 40 years which were about 16 cases making up to 32% of the total cases. 12 cases in this group were females. It was followed by 12 cases in the age group of 41 to 50 years making up to 24% of the total cases, 3 of them were males and 9 of them were females.

Age in Year	Number of Cases		Total	Percentage
	Male	Female		
<20	0	2	2	4
21 to 30	1	6	7	14
31 to 40	4	12	16	32
41 to 50	3	9	12	24
51 to 60	3	5	8	16
61 to 70	1	3	4	8
71 to 80	1	0	1	2
<90	0	0	0	0
Total	**13**	**37**	**50**	**100**

2. Incidence According To Sex:

Gender	Number of Cases	Percentage
Male	13	26
Female	37	74
Total	50	100.00

Out of the 50 cases studied, there was a female preponderance of 37 female patients against 13 male patients. Male to Female ratio was 1:2.

3. Clinical Features:

A. Symptoms :

Symptoms	No of cases	Percentage (%)
Pain	50	100
Nausea/vomiting	21	42
Flatulence, Dyspepsia	10	20
Jaundice	2	4%
Fever	3	6%

Pain:

i. Location and Character of Pain

Location	No of cases	Percentage (%)
Rt Hypo	42	84
Epigastric	8	16

Character	No of cases	Percentage (%)
Colicky	46	92
Dull aching	4	8

Radiation	No. of cases	Percentage (%)
Back	45	90
Shoulder	5	10

All patients in this study presented with abdominal pain with 42 of them presenting with right hypochondriac pain (84% of cases) and 8 patients presenting with epigastric pain (16% of cases). 46 patients presented with colicky type of pain(92% of cases) and 4 presented with dull aching type of pain(8% of cases).45 cases had radiation of pain to the back (90 % of cases) and 5 case had radiation of pain to the shoulder(10% of cases).

Next predominant symptom was nausea and vomiting in 21 cases (42% of cases) followed by flatulence and dyspepsia in 10 cases (20% of cases).2 patients had jaundice and 3 patients had fever.

B. Signs :

Signs	Number of cases	Percentage
Icterus	2	4%
Tenderness in upper abdomen	50	100%

All the 50 cases had tenderness in the upper abdomen and 2 cases had icterus.

4. Personal History

a. Diet :

Type of Diet	No. of cases	Percentage
Vegetarian	2	4%
Mixed	48	96%

Out of 50 cases, 48 cases consumed mixed type of diet (96 % of cases) and only 2 cases were vegetarians (4% of cases).

b. Incidence of obesity:

Body Type	No. of cases	Percentage
Obese	6	12%
Non obese	44	88%

All patients were examined for evidence of obesity. Cut off value for defining obesity was taken as > 45 kg/m2. 6 of our cases were found to be obese and rest 44 cases were found to be non obese.

5. Gall Stone Analysis

Type of Gallstone	Number of Cases	Percentage
Pigmented Black	45	90%
Mixed	3	6%
Cholesterol Stones	2	4%

In our study of 50 cases, on gall stone analysis, 45 cases were found to be having stones of pigmented variety (90% of cases), 3 cases were found to be having mixed stones (6% of cases), 2 cases were found to have cholesterol stones (4% of cases).

6. Histopathological Examination:

• Size of the gall bladder specimen:

Size of the gall bladder specimen	No. of cases	Percentage
Enlarged	10	20%
Contracted	40	80%

Gall bladder was found to be enlarged in 10 cases (20% of the cases), and contracted in 40 cases (80% of cases).

- Microscopic findings**:**

Microscopic Findings	Number of Cases	Percentage
Chronic cholecystitis	41	82%
Acute on Ch. Cholecystitis	9	18%

In the present study 41 cases were reported to have chronic cholecystitis (82% of cases), 9 cases were reported to have acute on chronic cholecystitis (18% of cases)

7. Bile Culture

Bile was sent for culture and sensitivity and gram's staining in all 50 cases. No growth was seen in all the cases after 48 hours. This can be attributed to the pre operative dose of antibiotic given to all patients before taking up for surgery.

IV. Discussion

In our study the youngest patient was a 15 year old female and oldest patient being 72 year old male. Increased incidence was observed in third and fourth decade i.e. 32% and 28 % cases, followed by 16% and 12% cases in fifth and second decade. Similar results were observed in studies done by Mohan et al[14] and Pradhan et al[15] maximum incidence was seen in fourth decade. A series by Thamil et al[16] showed maximum incidence in fifth and sixth decade.

In our study there was a female preponderance with a Male to Female Ratio of 1:2. Similar results with female-to-male preponderance were observed in Syam sundar et al[18] series with M: F Ratio of 1:1.5, in Mohan H et al[14] series with M: F Ratio of 1:6.4, in Pradhan SB et al[15] series with M: F Ratio of 1:3.2.

In our study out of 50 cases, 48 consumed Mixed diet and only 2 were vegetarians, making a Mixed: Vegetarian Ratio of 24:1.similar results were observed in a series by Pradhan SB et al[15] where ratio was 9:1 and in Selvaraju et al[18] series where ratio was 1.4:1.

Pain was the predominant symptom in the present study seen in 100 percent cases. Most common site of pain was right hypochondrium (84 % of cases), followed by Epigastrium (16 % of cases). Similar presentations were noted in the series by Pradhan SB et al[15](65% of cases) and by Thamil et al[16] (61.5% of cases).

42 % cases in our series presented with nausea and vomiting mainly during the attacks of pain. Similar findings were observed in series by Pradhan SB et al[15] (50 % cases).20 % cases had nausea and vomiting in a series by Thamil et al.[16]

In present study 80% stones were of pigmented variety, 4% were of cholesterol stones and 6% were mixed stones. In a series by Mohan H et al[14] Mixed stones were found in 62.30% cases, 3.20% cases had pigmented stones,17.30% cases had cholesterol stones whereas in Pradhan et al[15] series 78.75% cases had mixed stones,8.75% cases had pigment stones and 12.5% cases had cholesterol stones.

In Our Study size of gall bladder specimens was found to be contracted in 80% cases, normal in 0% cases, and was distended or enlarged in 20% cases. In a series by Tyagi et al, size of gall bladder specimens was found to be contracted in 16.6% cases, normal in 53.6% cases, and enlarged in 29.89% cases.

In present study 82% cases were reported to have chronic cholecystitis on microscopy and 18% cases were reported as having acute on chronic cholecystitis. Similar results were observed in a series by Thamil et al[16] with 87% cases reported as having chronic cholecystitis and 2.5% cases as having acute cholecystitis on microscopy.

V. Conclusion :

This study was conducted with 50 documented cases of Calculous Cholecystitis in Department of Surgery of Yenepoya Medical College and Hospital for a period of two years.

There may be some variations in the statistics as the sample size of this study is small for full statistical evaluation.

Nevertheless following conclusion can be drawn from our study:

- The age group of patients varied from 15 years to 72 years. The peak incidence being in third and fourth decade followed by fifth and second decade.
- There was a female preponderance with M:F ratio of 1:2.
- Pain was the most common symptom seen in all patients, most common location being in Right hypochondrium (84% cases) followed by Epigastrium (16% cases).In most patients pain radiated to the back.
- Next predominant symptom was nausea and vomiting (42%% of cases) followed by flatulent dyspepsia (20% of cases).2 patients had jaundice and 3 patients had fever.
- Tenderness in Upper Abdomen was the most common sign seen in all the cases, followed by icterus in 2 cases .
- 96% cases consumed mixed diet thus signifying increased incidence of calculous cholecystitis among non-vegetarians
- Gall stone analysis showed pigmented stones(90% of cases) as the most common variety , followed by mixed (6% of cases) and cholesterol type (4% of cases).
- Histopathological examination revealed chronic cholecystitis in most of the cases of our study.
- Bile culture showed no growth in all the cases of our study.

It can be concluded that Laparoscopic Cholecystectomy is the gold standard for the management of gall stone disease. With the advancement in equipment and gaining experiences in laparoscopy, most of the difficult gallbladder can be dealt laparoscopically. Preoperative risk factors can help to predict difficult gallbladder and conversion to Open cholecystectomy. Male gender, single large stone, thick-walled gallbladder, previous abdominal surgery and contracted gallbladder are the factors that proved to be significant in our study. These factors can predict difficulty to be encountered during surgery and help in making a decision for conversion thus shortening the duration of surgery and preventing unnecessary complications.

VI. Bibliography

[1]. Rosai J. Ackerman's Surgical Pathology, Vol I., 8th edition, Hardcourt Brace & Co. Asian Pvt Ltd 1996, pg 943-963.
[2]. F. Charles Brunicardi ,Margrett,Thai H et al "Gall bladder and the Extrahepatic Biliary System";Schwartz principles of surgery ;8Ih edition;2009; pg 1135-1167
[3]. David Q.-H. Wang, Nezam H. Afdhal "Gall stone Disease" ,Sleisenger Fordtran Gastrointestinal Liver Disease;9th Edition;2010; pg 1089-111.
[4]. Sujay pal, Sandeep Agrawal et al "gall bladder and biliary duct "essential of surgery 1st edition; pg 939-950
[5]. Nahrwold DL. The Biliary System. In: Sabiston DC, editor. Textbook of Surgery: The Biological Basis of Modern Surgical Practice. 15th ed. Vol 2 . USA: W.B. Saunders Company; 1997.pg 1117-1135.
[6]. Aijaz Ahmed, M.D., Ramsey C. Cheung, M.D.et al "Management of Gallstones and Their Complications" Am Fam Physician. 2000 Mar 15;61(6); pgl673-1680.

[7]. Marks JW, Bonorris GG, Albers G, Schoenfield LJ. The sequence of biliary events preceding the formation of gallstones in humans. Gastroenterology. 1992; 103:pg 566-70.
[8]. Jayanthi V. Pattern of gallstone in Madras city, southern India - a hospital based survey. J Assoc Physicians India 1996;44: pg 461-4.
[9]. Sarin SK, Kapur BML, Tandon RK. Cholesterol and pigment gallstones in northern India. A prospective analysis.Dig Dis Sci 1986;31:pg 1041-5.
[10]. Bilhartz LE, Horton JD. Gallstone disease and its complications. In: Feldman M, Friedman LS, Sleisenger M, eidtors. Sleisenger and Fordtran's Gastrointestinal and Liver Disease: Pathophysiology, Diagnosis, Management. 7th ed. Vol 1. Philadelphia: WB Saunders; 2002. pg. 1065-73.
[11]. Cuschieri A, Dubois F, Mouiel J, Mouret P, Becker H, Buess G. The European experience with laparoscopic cholecystectomy. Am J Surg 1991 Mar;161(3):385-7.
[12]. The Southern Surgeons Club. A prospective analysis of 1518 laparoscopic cholecystectomies. N Engl J Med 1991 Apr;324(16):1073-8.
[13]. Liu CL, Fan ST, Lai EC, Lo CM, Chu KM. Factors affecting conversion of laparoscopic cholecystectomy to open surgery. Arch Surg 1996 Jan;131(1):98-101
[14]. Mohan H, Punia RP S et al: Morphological spectrum of gallstone disease in 1100 cholecystectomies in North India ;lndian Journal of Surgery, Vol. 67, No. 3, May-June, 2005, pg. 140-142.
[15]. Pradhan SB, Joshi MR et al: Prevalence of different types of gallstone in the patients with cholelithiasis at Kathmandu Medical College, Nepal: Kathmandu Univ Med J (KUMJ). 2009 Jul-Sep; 7(27): pg.268-71.
[16]. R Thamil Selvi, Pammy Sinha, P.M Subramaniam et al "A clinicopathological study of cholecystitis with special references to analysis of cholelithiasis" International Journal of Basic Medical Science-July 201 l,vol;2,issue 2.
[17]. Syam Sundar Byna et al: Epidemiological and Pathological Study of Resected Gail Bladders due To Cholelithiasis. Int. J. Chem. and Life Sciences, 2013, 02 (07). pg.l 195-1198
[18]. R.Selvaraju, R.Ganapathi Raman*, G.Thiruppathi, R.Valliappan et al: "Epidemiological Study of Gallstone in Cuddalore District" International Journal of Pharra Tech Research; April-June 2010;Vol.2, No.2, pg. 1061-1067.