

*Original Article*

# A STUDY ON CHOLECYSTECTOMY SPECIMENS

Anamika Gaharwar\* , Suniti R Mishra\* , Vinod Kumar\*\*

\* Department of Anatomy, GSVM Medical College Kanpur, U.P., INDIA.

\*\* Department of Anatomy, RIMS, Saifai Etawah U.P., India.

A Retrospective Study of cholecystectomy specimens in benign spectrum of Diseases

**ABSTRACT:** The present study was undertaken to study various macroscopic and microscopic features of 132 cholecystectomy specimens. Our study included only benign cases. Our study concluded that in maximum number of 78.8% cases gall bladder was distended 7-10cm , in 15.9% cases it was <7cm and in 5.3% cases it was >10cm in size Calculi were present in 97.72% cases while no calculi was seen in 2.27% cases. Mixed type of stone was the commonest finding, present in 89.39% cases, cholesterol type in 10.61% cases and no case of pigment stone was reported. Chronic cholecystitis was present in 76.52% cases , acute cholecystitis in 17.42% cases and cholesterolosis in 6.06% cases. Mixed atrophic-hyperplastic was the commonest mucosal change reported in 63.64% , cases , atrophy in 21.21% cases and hyperplasia in 15.15% . cases .

**KEY WORDS:** Calculi; Cholecystitis; Cholelithiasis; Gall stone; mucosa;

## INTRODUCTION

Gall bladder is a slate blue pyriform sac precisely sunken in fossa in right hepatic lobe of liver. It is 7-8cm long, 3cm broad and 30-50ml in capacity. It has Fundus, body and neck. Gall bladder helps in storing and concentrating bile[1]. Disorders of gall bladder affect significant patients of world population. In about 95 percent cases gall stones are present by in about 5 percent cases they are absent [2]. It is reported that the gallstone formation is favoured by bile stasis due to gallbladder dyskinesia resulting from gallbladder wall pathology and also due to exposure of gallbladder mucosa to high concentrations of mucus, calcium and lipids [3]. The latest recommendations state that all gallbladders removed for benign disease should be examined as significant pathology may be present with normal gross morphology [4].

Gall bladder stones are classified according to their chemical composition as cholesterol stones,

mixed stones and pigment stones. Cholesterol stones consist almost entirely of cholesterol: Mixed stones accounts for 90% of gall stones in which cholesterol is the main content other components include calcium bilirubinate, calcium phosphate, calcium carbonate, calcium palmitate and proteins [5].

Gall stone disease is a worldwide common health problem and produces diverse histopathological changes in gall bladder [6]. Benign diseases of gall bladder include chronic cholecystitis with cholelithiasis, acute cholecystitis with or without cholelithiasis, empyema of gall bladder and cholesterolosis. The gall bladder mucosa plays a regulatory role in cholelithiasis as it promotes the nucleation of stones [7]. Although symptomatic cholelithiasis is considered a benign disease entity, gallstones are a known risk factor for gall bladder malignancy [8].

The present study was undertaken to study macroscopic and microscopic changes in

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## Address for Correspondence :

Dr. Suniti R Mishra  
Professor & Head  
Department of Anatomy,  
G.S.V.M. Medical College, Kanpur  
Uttar Pradesh, INDIA  
Phone No. 09559994994  
Email Id- dr.suniti@yahoo.co.in

cholecystectomy specimens in benign diseases of gall bladder. The objective was to confirm the clinicoradiological diagnosis, assess the predisposing factors and spectrum of histopathological changes in the gall bladder.

**MATERIALS AND METHODS**

The study was conducted retrospectively on 132 cases, who underwent cholecystectomy for any benign gall bladder disease, at the department of Anatomy in association with department of General Surgery and department of Pathology, GSVM Medical College, Kanpur, Uttar Pradesh, India. Out of the 132 cases, 121 cases were females while only 11 cases were males. The cases were grouped as per age in decades. The clinical history was recorded. Presence of diabetes, intake of oral contraceptive in females and family history was also noted. After cholecystectomy, the gallbladder specimens were collected, fixed in 10 percent formalin and labeled. Gross features like length of gall bladder, presence or absence of calculi was noted. Then specimens were sectioned serially. Routine processing of tissues sections and staining with haematoxylin and eosin was done and examined.

**OBSERVATIONS**

Out of 132 cases (121 females, 11 males), 58 patients (43.94%) were in 5th decade i.e. age group of 41-50 followed by 30 patients (22.72%) in 4th decade of life i.e 31-40 yrs, 20 patients (15.15%) in 6th decade, 18 (13.64%) in 3rd decade, 4 (3.03%) in 7th decade and 1 each (0.76%) in 1st and 2nd decades. Among 121 female patients 78 were taking OCPs containing oestrogens and 43 were not taking OCPs. Out of 132, 18 cases were known Diabetic.(Table1)

**Table 1:** Association of predisposing risk factors for cholelithiasis (n = 132)

	Number of Cases	Percentage
Sex		
Female	121	91.66
Male	11	8.33%

Prevalance of Gall stones among Diabetes Mellitus		
<b>Diabetic patients</b>	18	12%
Non diabetic patients	114	88%
Prevalance of Gall stones among females on Oral Contraceptives (OCP)		
Taking OCP	78	64.6%
Not taking OCP	43	35.5%

104 (78.8%) specimens were of 7-10 cm in size, 21 (15.9%) were of < 7cm and 7 (5.3%) specimens were of > 10 cm in size. Out of these 132 specimens calculi was present in 122 (92.42%) specimens (fig 1-2), in 7 (5.33%) specimens pus was also present along with calculi and 3 (2.27%) specimens had no calculi. Out of 129 specimens (122 + 7) specimens with calculi, mixed variety of stones was present in 115 (89.14%) specimens and 14 (10.85%) specimens had cholesterol type stones, pigment stones were not present in any (Table 2-4).

**Table No. 2 :** Size Of Gall Bladder (n = 132)

Gall bladder size (in Cm.)	Number of Cases	Percentage
< 7 Cm	21	15.9%
7 - 10 Cm	104	78.8%
> 10 Cm	7	5.3%

**Table No. 3:** Macroscopic Features of Cholecystectomy Specimen (N = 132)

Feature	Number of Cases	Percentage
Presence of Calculi	122	92.42%
Presence of Calculi and Pus	7	5.33%
Absence of Calculi	3	2.27%

**Table No. 4:** Gall Stones Types (n = 129 out of 132)

Type of Stone	Number of Cases	Percentage
Mixed Stones	115	89.14%
Cholesterol stones	14	10.85%
Pigment stones	0	0



Figure 1- Cholelithiasis with multifaceted stone



Figure 2- Cholelithiasis with multiple very small sized stones

On histopathological examination, Chronic cholecystitis was evident in 101 (76.52%) specimens, while in 23 (17.42%) specimens exhibited acute cholecystitis and in 8 (6.06%) specimens cholesterolosis (Table 5, fig. 3) was present. In cases with chronic cholecystitis scattered lymphocytes, plasma cells, fibrosis and Rokitansky aschoff sinuses were also prominent.

**Table 5:** Histological appearance of the specimen (n = 132)

Feature	Number of Cases	Percentage
Chronic Cholecystitis	101	76.52%
Acute Cholecystitis	23	17.42%
Cholesterolosis	8	6.06%

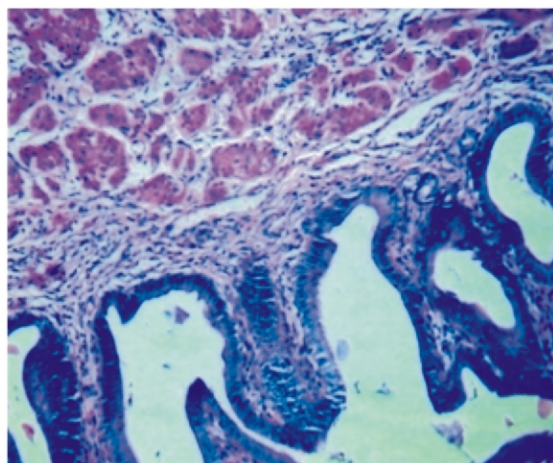


Figure 3. -Showing Gallbladder with cholesterolosis with single gall bladder stone

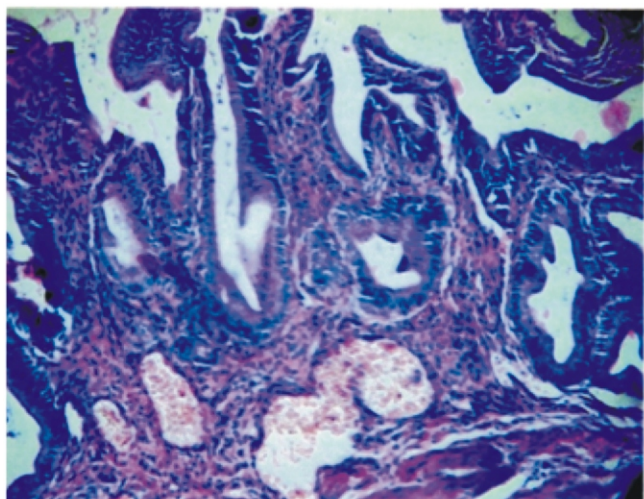
Mixed atrophic- hyperplastic mucosa was present in 84 (63.64%) and atrophic mucosa was present in 28 (21.21%) cases while Hyperplastic type of mucosa was present in 20 (15.15%) cases (Table 6; fig 4-6).

**Table 6 :** Mucosal Pattern of the gall bladder (n = 132)

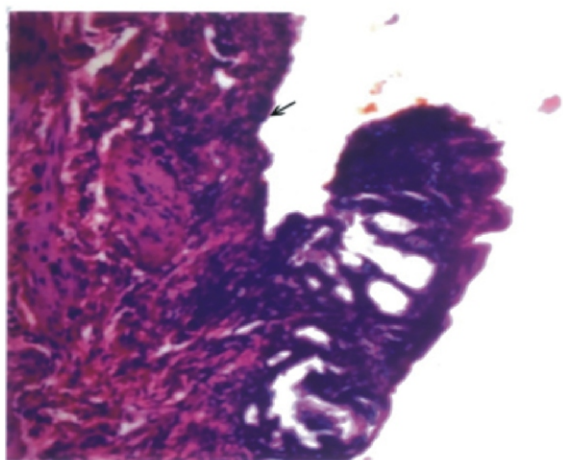
Feature	Number of Cases	Percentage
Hyperplastic	20	15.15%
Atrophic	28	21.21%
Mixed Atrophic Hyperplastic	84	63.64%



**Figure 4- Showing Chronic Cholecystitis with marked lymphocytosis**



**Figure 5- Showing Chronic Cholecystitis with mixed atrophic hyperplastic mucosal pattern**



**Figure 6- Showing Chronic Cholecystitis with atrophic mucosal pattern ( H.E. (x450)**

## DISCUSSION

Gallstones are the commonest biliary pathology and are major cause of morbidity and mortality [9]. In the present study female preponderance for the disease was observed i.e. out of the 132 cases, 91.66% cases (121) were females while only 8.33% cases (11) were males. It is reported that human gall bladder wall has estrogen and progesterone receptors and the female sex hormones are predisposing factors for cholelithiasis.[10] Among 121 female patients 78 were on OCPs containing oestrogens and 43 were not taking OCPs. It is reported that bile becomes more lithogenic when women are placed on OCPs containing oestrogen. Further relatively more casual relationship between oestrogen and Gall Stones was suggested by study showing increase lithogenicity of bile and biliary stone formation in males given estrogen for Carcinoma Prostate[11]. In the present study maximum number of cases were in 5th decade (43.94%) followed by those in 4th decade (22.72%) as also reported by other workers [12]. Increase in the prevalence of gall stone with age is probably because of decrease in activity of cholesterol reductase and increase in activity of HMG CO A reductase resulting in increased cholesterol secretion and saturation of bile. [13].

The specimen of the rare single female child of cholecystectomy in first decade of life (7yrs) showed mixed stones. The presence of family history in her mother and maternal uncle suggest the genetic predisposition of the cholelithiasis. [14]

In the study 18 cases out of 132 cases were diagnosed diabetic patients. It is reported that a particular disposing factor in diabetes is an impairment of Gall Bladder emptying which may be related to presence of autonomic neuropathy creating a large flaccid, poorly emptying organ [15]. So possible role of diabetes in predisposal for Gall Stones was observed.

Cholelithiasis is a common disease [9]as also observed in our study where calculi were present in 122 cases (92.42%), calculi with pus in 7 cases (5.33%) and acalculus cholecystitis in 3 cases (2.27%) (fig 1).

The normal length of the gall bladder ranges from 7-10 cm.[16-17] In the fasting state it is longer (10cm) while after a fatty diet a normal functional gall

bladder is in contracted state (<7cm). In the present study, in 104 cases (78.8%) gall bladder was distended (7-10 cm), in 7 cases (5.3%) it was > 10cm and in 21 cases (15.9%) it was < 7 cm. Similar size of cholecystectomy specimen < 7 cm in 49.7% cases, 7-10 cm in 36.46% cases and in 9.89% of cases size was more than 10 cm was reported in past study [18].

In the present study, acute cholecystitis in 23 cases (17-42%), Chronic cholecystitis with cholelithiasis (fig 1) in 101 cases (76.5%) and cholesterolosis account for 8 cases (6.06%) . Acute cholecystitis is the chemical or bacterial inflammation of Gall bladder. Positive bacterial culture of bile was found in 50% - 70% of cases [19]. Chronic cholecystitis may result due to repeated bouts of mild to severe acute cholecystitis. In 90% cases it is associated with gall stones [20]. Cholesterolosis of gall bladder is deposition of lipid and cholesterol esters in subepithelial cell [21]. Cholecystitis in maximum number of cases (50.8%) with chronic cholecystitis as major histopathological findings was identified in 64.8% cases [22-23]. None of the cholecystectomy specimen showed normal microscopic pathology in this study though minimally found to be [24] in 6(0.55%) cases of microscopically normal gall bladder in the series of cholecystectomy specimen. In the study empyema was seen in 7 (5.33%) cases. In a study on cholecystectomy specimens chronic cholecystitis in 75%, empyema only in 1.04% cases and cholesterolosis in 12.25% cases[18]. Empyema of gall bladder is often difficult to distinguish from uncomplicated acute choleystitis[25]. Our study reported cholesterolosis in 8% and all cases were reported in females. In a study cholesterolosis was found in 2.7% and all cases were multiparous female [22]. Cholesterolosis is mostly present in multiparous females [26].

The normal histological structure of gall bladder consist of (inside to outside) - Columnar epithelium with microvilli, lamina propria, muscular layer and serosa. The epithelium and lamina propria together known as the mucosa [27]. The mucosal pattern needs to be studied very carefully so as to detect the high risk cases for gall bladder malignancy since it is widely repored that long standing mucosal irritation by the stones cause atypical cellular changes and hyperplasia which may progress to metaplasia and

carcinoma in situ[28]. Mixed atrophic variety in 84 cases (63.3%) atrophic pattern in 28 cases (21.21%) and hyperplasia in 20 cases was seen in this study. Study [29] reported epithelial hyperplasia in 46.2% cases. Another study [18] reported mucosal hyperplasia in 25.26% acute and chronic inflammatory lesions with ulcerations in 13.02 % and cholesterolosis in 12.25% cases. The careful examination of mucosa may help in detection of gall bladder malignancy in earliest phase. In this study also mucosal hyperplasia in 20 cases suggest their high risk for malignancy and need to be carefully examined and managed.

#### **CONCLUSION:**

Cholelithiasis with chronic cholecystitis was more prevalent in females than males. It was common in 5th decade of life. The condition is also associated with intake of oral contraceptives(oestrogen), diabetes and genetics. The Calculi were of mixed variety followed by cholesterol type. There was a wide spectrum of histopathological changes in gall bladder. Chronic cholecystitis with mixed atrophic hyperplasia was the commonest histological finding. The hyperplastic mucosal changes as observed in the study indicate histopathological examination should be done in every cholecystectomy sample even for benign disease in order to to diagnose gall bladder malignancy in early stage.

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