Original Research Article

Clinicopathological profile of cholecystectomy specimens-a retrospective and prospective study

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Abstract

Objectives: To study the magnitude of lesions in gallbladder and to study different types of histopathological lesions occurring in the gallbladder and to co-relate them clinicopathologically. **Design and Methods:** Cholecystectomy specimens received in Pathology department of our hospital for histopathological examination were included in this study. Patients age, sex, presenting symptoms, serum bilirubin levels and USG findings among others were noted. After gross examination minimum three sections one each from neck, fundus and body were given. The sections were subjected to routine paraffin processing and H&E staining.Special stains like PAS, Mucicarmine were performed whenever indicated. The sections were studied microscopically, and findings noted. **Results:** Variety of lesions can be found if cholecystectomy specimens were examined meticulously.Patients usually present with signs and symptoms of long duration and with vague complaints like pain in abdomen, nausea, dyspepsia. Most of the cases seen were of chronic calculus cholecystitis. These cases were predominant in females and associated mostly with pigmented stones. All cases of carcinoma gallbladder were missed on clinical examination and ultrasonography. **Conclusion:** Diagnosis was established on histopathology. Hence histopathology remains gold standard for revealing unsuspected lesions

Keywords: Adenocarcinoma, Cholecystitis, Gall bladder, Histopathology, Prevalence

Introduction

Gall bladder is one of the most commonly resected organs; the number of cholecystectomies has increased more than 50% in the last decade [1]. This organ is not essential for biliary function because humans do not suffer from malabsorption of fat after cholecystectomy [2]. Over 95% of biliary tract diseases are attributable to cholelithiasis [2]. Cholelithiasis produces diverse histo-pathological changes in mucosa ranging from acute inflammation to dysplasia and carcinoma.

Numerous reports have emphasized the high frequency of gallstones in patients with gallbladder carcinoma [3]. The aim of present study is to study the magnitude of lesions in gallbladder, to study different types of histopathological lesions occurring in the gallbladder and to co-relate them clinicopathologically. Through this study we want to emphasize the importance of meticulous histopathological examination of each and every cholecystectomy specimen, especially because gallbladder carcinomas if missed, can prove fatal for the patient.

Manuscript received: 4th October 2018
Reviewed: 14th October 2018
Author Corrected: 20th October 2018
Accepted for Publication: 25th October 2018

Materials and Methods

Place of study

- The present study was carried out in the department of pathology in Grant medical college from November 2006 to November 2011.
- Type of study
- Prospective cases were 452 and retrospective cases were 204.
- Sampling methods:
- Cholecystectomy specimens fixed in 10% formalin were received. Gross examination findings along with characteristic of stones, relevant clinical history and USG finding were noted.

- **Inclusion and exclusion criteria:**
- All cholecystectomy specimen with relevant history in the test requisition form were included in the study.
- Any specimen with discrepancy were excluded.

Method

- After gross examination representative sections from neck, fundus and body were given.
- H&E staining was done on all sections. Special stains like PAS, Mucicarmine were performed whenever indicated.
- The sections were studied microscopically after processing.
- Statistical methods:
- Microsoft excel and GraphPad calculator were employed for statistical analysis.

Results

Age and Gender: Youngest patient in our study was 5 months old. Most cases were in the age group of 41-50 years (30.18%). Female preponderance was found in this study. Ratio of male to female cases was 1:2.03.

Clinical features: Maximum number of patients (98.93%) presented with pain in abdomen followed by vomiting (23.93%) .Other details are presented in Table 1.

Table-1: Clinical presentation of patients with gallbladder lesion.

Symptoms & Signs	No of Cases	Percentage
Pain in abdomen	649	98.93%
Jaundice	91	13.87%
Vomiting	157	23.93%
Fever	97	14.78%
Other	90	13.72%

Serum bilirubin: Serum bilirubin was available in 631 of 656 cases. Maximum number of cases (85.57%) had bilirubin within normal limits.The findings are presented in Table 2.

Table-2: Distribution of cases according to serum bilirubin levels.

Serum bilirubin	No of cases	Percentage
<1 mg %	540	85.57%
1.1-2	60	9.51%
2.1-3	18	2.85%
3.1-4	9	1.43%
>4	4	0.63%

USG findings:USG findings from the records were studied and analysed. Maximum numbers of patients (83.17%) were diagnosed as chronic calculus cholecystitis.Other findings and percentage of patients is shown in Table 3&4.

Table-3: USG findings.

USG impression	No. of cases	Percentage
Acute acalculus cholecystitis	3	0.48%
Chronic acalculus cholecystitis	44	7.12%
Chronic acalculus cholecystitis with other conditions	17	2.75%
Chronic calculus cholecystitis	514	83.17%
Chronic calculus cholecystitis with other conditions	40	6.47%
Total	**618**	**100%**

Table-4: Details about "other findings" on USG.

Conditions associated with chronic cholecystitis	No. of cases	Condition associated with chronic cholecystitis	No. of cases
Cholelithiasis with CBD stone	16	Hepatomegaly	1
Polyp	4	Hepatosplenomegaly	1
Sludge	12	Splenomegaly	2
Hydatid cyst	2	Pleural effusion	1
Fatty liver	8	Ovarian cyst	1
Fibroid	2	Choledochal cyst	5
Renal stone	2		

Type of stones: Stones could be typed in 554 cases. Cholesterol stones were 35.01%. Of these 58.76% were multiple stones and 41.24% were single stones. Pigment stones were commonest (60.29%). Of these 76.65% were multiple and 23.35% were single. Mixed stones were 4.70%. Details of findings are shown in Table 5.

Table-5: Distribution of cases of cholelithiasis according to type of stones

Type of stone	Multiple	%	Single	%	Total	%
Cholesterol	114	58.76%	80	41.24%	194	35.01%
Pigmented	256	76.65%	78	23.35%	334	60.29%
Mixed	12	46.15%	14	53.85%	26	4.70%
Total	**382**	**68.95%**	**172**	**31.05%**	**554**	**100%**

Various histopathological lesions: Maximum number of cases were of chronic calculus cholecystitis (75.15%) followed by chronic acalculus cholecystitis (13.72%) cases. Carcinoma of gallbladder was found in only 5 (0.76%) cases. Details are shown in Table 6.

Table-6: Various histopathological lesions seen in gallbladder

Histopathological lesion	No of cases	Percentage
Acute acalculus cholecystitis	3	0.46%
Acute calculus cholecystitis	18	2.74%
Chronic acalculus cholecystitis	90	13.72%
Chronic calculus cholecystitis	493	75.15%
Xanthogranulomatous cholecystitis	13	1.98%
Eosinophilic cholecystitis	4	0.61%
Follicular cholecystitis	4	0.61%
Lymphoeosinophilic cholecystitis	2	0.30%
Mucocele	1	0.15%
Cholesterolosis	5	0.76%
Granulomatous cholecystitis	1	0.15%
Gangrenous cholecystitis	2	0.30%
Atresia of gallbladder	1	0.15%
Adenoma	2	0.30%
Carcinoma gallbladder	5	0.76%
Chronic calculus cholecystitis with cholesterol polyp	1	0.15%
Chronic calculus cholecystitis with Cholesterolosis	9	1.37%
Chronic acalculus cholecystitis with Cholesterolosis	2	0.30%
Total	**656**	**100%**

We also analysed the findings of histopathological examination with type of stones present. Pigmented stones were more in number in chronic calculus cholecystitis. Of total 5 cases of carcinoma of gallbladder, stones were associated with 4 cases and one was cholesterol and other 3 were pigmented stones.Much of stones were associated with chronic calculus cholecystitis (493 cases).The predominant stones were pigmented stones. Detailed analysis is presented in Table 7.

Table-7: Histopathological findings compared with type of stones present.

Histopathological lesions	Cholesterol	Pigmented	Mixed	Total
Acute calculus cholecystitis	5	13	0	18
Chronic calculus cholecystitis	171	297	25	493
Xanthogranulomatous cholecystitis	6	6	1	13
Follicular cholecystitis	1	3	0	4
Eosinophilic cholecystitis	0	4	0	4
Lymphoeosinophilic cholecystitis	2	0	0	2
Gangrenous cholecystitis	0	1	0	1
Carcinoma gallbladder	1	3	0	4
Mucocele	0	1	0	1
Cholesterolosis	3	0	0	3
Adenoma	0	1	0	1
CCC with cholesterol polyp	0	1	0	1
CCC with cholesterolosis	5	4	0	9
Total	**194**	**334**	**26**	**554**

We found 5 cases of carcinoma gallbladder, all of them (100%) were adenocarcinoma. Incidence of pyloric metaplasia was 7.47% (i.e.49 of 656) and that of intestinal metaplasia was 0.30% (i.e.2 of 656). Most cases of the pyloric metaplasia were associated with chronic calculus cholecystitis (59.19%). 50% of cases of intestinal metaplasia were associated with chronic calculus cholecystitis and chronic acalculus cholecystitis each. Adenomatous hyperplasia (1 case), Papillary hyperplasia (1 case), cholesterol polyp (1 case) and tubular adenoma (2 cases) were other associated findings in cholecystectomy specimen.

Discussion

Incidence of biliary disease is notably high in Kashmir, Chandigarh as per study of Khuroo et al 1989 [4], Singh V et al [5]. Clinical observation suggests that the patients with gallbladder disease tend to be “fat, fertile, female of forty”. The risk of gallstones has been associated with history of childbearing, obesity, diabetes mellitus, oestrogen replacement therapy [6], oral contraceptive pill usage [7], pancreatitis, cancer of gallbladder, cirrhosis, ileal disease, gallbladder carcinoma [8].

Age and Gender: Pal et al [9] noted the maximum age incidence in 4th decade. Attili A et al[10] noted that the male to female ratio for gallstone disease was 2.9 between 30-39 yrs., 1.6 between 40-49 yrs. and 1.2 between 50-59 yrs. of age.Mohan et al [11] found that the age of the patients varied from 10 to 90years with maximum number of cases between 31 and 40 years of age. Mazlum M et al [12] also noted male to female ratio being 1:2.33. Singh A 13], Raza [14] and Udwadia [15] found the maximum incidence in the age group between 3rd to 5th decades. Singh A[13]found the disease to be predominant among multiparous women. In our study, the maximum numbers of cases were in age group of 41 to 50 years with the male to female ratio being 1:1.91. Our findings correlated well with the above observation of Pal et al (1980)[9], and Mohan et al (2005)[11], Mazlum M et al (2010) [12].

Chatterjee and Banerjee (1989)[16] reported 35 patients in less than 20 years age group. We observed 37 cases in less than 20 years age group, out of this 1 case was atretic gallbladder. The incidence of cholecystitis was on an increase in younger age group, even in children, infant and in new-born. This increase is no longer a curiosity [17]. Giovanni C et al [18] found male to female ratio of 1:2.32. Bekele Z and Tegegn [19] also reported similar male to female ratio in their study. In study by Kotwal et al (1998) [20] the patients with gallstones include 375 women with average age of 40 years and 112 men with average age of 48.7 years. 15.7% of the women were nulliparous, 12% had one child and 23% had two children each.Khanna R et al (2006) [21] Out of 140 gallbladder specimens, 116 were from female and 24 from male patients (M: F ratio 1: 4.8). Mazlum et al (2010) [12] found male to female ratio of 1:2.33. Our study revealed a female preponderance (68.07%) of total cases with male to female ratio being 1: 2.03. This finding agrees with other authors.

Clinical features: The patients were divided according to the duration of symptoms. Nearly 83% patients presented with more than 6 weeks history and remaining 16% presented with shorter duration of symptoms. The symptom of abdominal pain was found to be 100% by Chaterjee (1989) [16] and Rahman G (2005) [22] which was close to our findings of 98.93%. Other studies showed much lower values. Jaundice was found in 13.87% cases in our study which correlated well with findings of Meyer (1967) [23] and Chaterjee (1989)[16].

Raza 84 reported 41.6% patients with icterus. Fever was reported in 14.78% cases in our study which correlated well with findings of Pal (1980) [9]. We found other associated signs and symptoms in 13.72% of our patients which were much lower than other studies. Saxena et al (1991) [24] and Bhansali S (1980)[25] have reported conditions like rheumatic heart disease, pancreatitis, diabetes, haemolytic disease, hypertension, Koch's abdomen, obesity, cirrhosis, inguinal hernia and hydatid cyst as associated diseases.In our study, we found associated diseases like diabetes, sickle cell trait, hereditary spherocytosis, Koch's abdomen, appendicitis, hypertension, hydatid cyst, renal stones, ovarian cyst and fibroid uterus, panniculitis.

Serum bilirubin: We found more number of cases showing normal bilirubin level (85.57%) in comparison to those found in study of Pal (1980)[9].

USG findings: Stones that cast an acoustic shadow or non-visualization of normal gallbladder are defined as the major criteria for gallbladder abnormality. The findings that point to the diagnosis of acute cholecystitis are gallbladder wall thickening (>5 cm), tenderness of the gallbladder when palpate during examination (sonographic Murphy's sign), gallbladder enlargement (>5cm) and round gallbladder shape.In our study, USG findings were available in 618 cases of 656 cases and maximum numbers of patients 83.17% were diagnosed as chronic calculus cholecystitis. Other associated findings in our study included sludge, polyp, common bile duct stone, choledochal and hydatid cyst.

All cases of gallbladder carcinoma were diagnosed only on histopathology and were reported on USG as cholelithiasis or cholecystitis due to wall thickening. Angela et al (2001)[26] found that wall thickening is the most diagnostically challenging because it mimics the appearance of more common acute and chronic inflammatory conditions of the gall bladder and even subtle changes in wall thickness may reflect early carcinomas. Sugiyama M (1998)[27] found that of 65 cases diagnosed on endoscopic USG, as 38 cholesterol polyps, 9 adenomyomatosis and 16 adenoma and adenocarcinoma which turned out to be 40 cholesterol polyps, 9 adenomas and 16 as adenoma and adenocarcinoma on histopathology. Moriguchi JT et al [28] noted the gallbladder polypoid lesions in 2.5% cases on USG.Japan has highest incidence of polypoidal gallbladder lesions. In our study only 3 (0.49%) cases were diagnosed as polyp on USG.

Type of stones: We found 35.01% cases of cholesterol stones, 60.29% cases of pigmented stones and 4.70% cases of mixed stones. In study by Friedman G (1966)[29], out of 255 cases 15 cases (5.88%) had pure cholesterol stones,59 cases (23.14%) had pure pigmented stones and the other 181(70.98%) cases were put in third category.

Pal et al (1980)[9] reported gallstones in 73.13% cases. Out of which 89.79% were mixed stones, 4.08% were cholesterol stones and 6.12% cases were pigmented stones. Hussain et al (1984)[30] analysed, 91 gallstones by gross and biochemical analysis. They noted 68% were mixed type and 30% were pure cholesterol stones.

TITK et al (1996)[31] reported 46% as cholesterol stones, while 30.5% black pigmented stones and 13% as brown stones by biochemical analysis thus total pigmented stones were 43.5%.

A study in South India by Jayanthi et al [32] showed that there is a predominance of pigment and intermediate gallstone (98%) in this region.

Mohan et al (2005)[11] studied 1100 cases and on morphological analysis of gallstones found mixed type of stones in 686 cases (62.3%), pigment type of stones in 34 cases (3.2%), cholesterol type of stones in 182 cases (17.3%), and combined type stones in 148 cases (14%).

Most of the authors reported mixed stones to be commonest type while in our study only 4.7% cases 4 had mixed stones. Our findings were close to those found by TITK (1996)[31], Jayanthi et al [32] also found predominance of pigmented stones. But our findings did not correlate well with the other studies. This could be because lack of proper categorization of stones as we used only gross description as our criteria.

Original Research Article

Various histopathological lesions

a) Acute cholecystitis: The incidence of acute cholecystitis was 21(3.20%) cases out of 656 cases. Male to Female ratio was 1:1.33. Five numbers of cases of acute cholecystitis were found in age group of 21-30, 31-40, and 41-50 years each (Figure 1). In addition to the above, two cases presented with gangrene of gallbladder and one case presented as Mucocele.18 out of 21 cases in addition had stone. Of these 5 had cholesterol stones, 13 had pigmented stones. On microscopy four cases were associated with pyloric metaplasia. Our findings are close to findings of study by Pavlidis T et al (2000) [33].

Fig 1: Gallbladder specimen of acute cholecystitis showing hemorrhage, congestion and purulent exudate on external surface

b) Chronic cholecystitis: Chronic cholecystitis was the commonest lesion found in our study i.e. 595 of 656 cases (90.70%) (Figure 9&10). Male to Female ratio in cases of chronic cholecystitis was 1:2.06. Maximum cases belonged to age group of 41-50 years (29.92%) followed by the age group of 31-40 years (26.55%). Of the total cases of chronic cholecystitis, 503 cases were associated with stones (84.53%) (Figure 2&3). Of these, 176 (35%) cases had cholesterol stones, 302 (60.04%) had pigmented stones and 25(4.96 %) hadmixed stones. Associated microscopic features found were pyloric metaplasia in 43 cases, intestinal metaplasia in 2 cases. Case of adenomatoid hyperplasia and papillary hyperplasia was associated with chronic cholecystitis. Case of cholesterol polyp was also found in the setting of chronic cholecystitis. 11cases of cholesterolosis were found in association of chronic cholecystitis.

Fig 2 : Gallbladder specimen of chronic calculus cholecystitis showing dilatation and congestion of vessel with multiple mixed stones

Fig 3 : Multiple mixed stones seen in chronic calculus cholecystitis

Mohan et al (2005) [11] studied of 1100 cases and found that lesions associated with chronic cholecystitis were cholesterolosis in 112 cases (10.1%), Xanthogranulomatous cholecystitis in 26 cases (2.3%), follicular cholecystitis in 26 cases (2.3%), ceroid granulomas in 10 cases (0.9 %), eosinophilic cholecystitis in 6 cases (0.5%) and carcinoma in 12 cases (1.09%). Barcia JJ [34] noted 75% incidence of chronic cholecystitis with epithelial metaplasia and 73% with regenerative epithelium. The association of cholecystitis and cholelithiasis was found in 87% cases by Graeme PD et al [35]. Thus, our findings were in accordance with Raza (1990) [14] and Mazlum et al (2010) [12].

c) Xanthogranulomatous cholecystitis: The incidence of Xanthogranulomatous cholecystitis in our study was 1.98%. (Figure 4,5). The male to female ratio was 1:1.6. The maximum number of cases of Xanthogranulomatous cholecystitis was seen in age group of 31-50 years (61.54%).

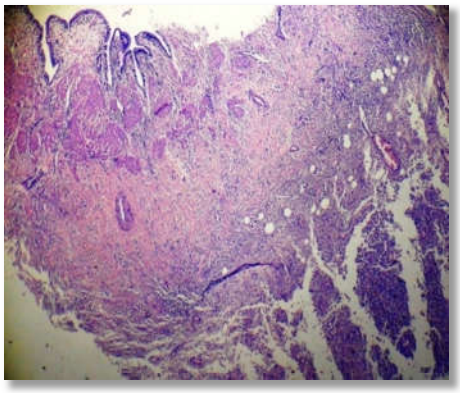

Fig 4: Xanthogranulomatous cholecystitis showing collection of foamy macrophages histiocytes in wall of gallbladder. (H&E,4X).

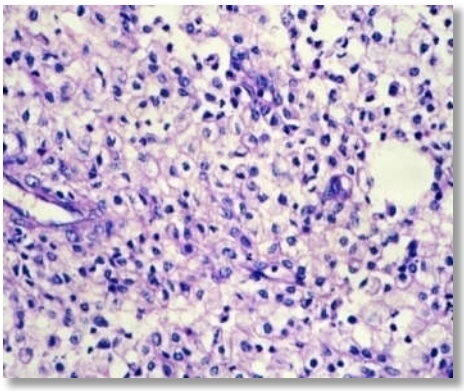

Fig 5: Xanthogranulomatous cholecystitis and showing collection of foamy macrophages and histiocytes in wall of gallbladder. (H&E,40X)

All cases were associated with cholelithiasis. Of these 6 were cholesterol stone, 6 were pigmented stones and 1 case was mixed stone.

Roberts KM et al (1987)[36] found 13 cases of xanthogranulomatous cholecystitis in study of 724 cases (1. 8%). Of 13 cases, 7 were females and 6 were males. All patients had gallstones. Karabulut Z et al (2003)[37] found 12 cases of xanthogranulomatous cholecystitis in a study of 770 cases (1. 56%). Of these, there were 4 males and 8 females. 11 patients had gallstones.

Guzman V (2004)[38]found182 cases in study of 12426 cases (1.46%). Xanthogranulomatous cholecystitis associated with gallstones in 85% of the cases. Carcinomatous lesions were found in 3% of the cases.

Adriana L et al (2010)[39] found 29 cases of xanthogranulomatous cholecystitis in study of 1689 cases (1. 7%). Of these, 5 were males and 24 were females.In our study, 13 cases of xanthogranulomatous cholecystitis were found out of 656 cases.

d) Follicular cholecystitis: We reported 4 cases of follicular cholecystitis (0. 61%). All cases were seen in female.
The age of presentation was between 31-60 years. All cases were associated with gallstones. 3 cases had pigmented stones and one had cholesterol stone. Mohan et al (2005)[11]reported follicular cholecystitis in 26 cases (2.3%) of 1100 cases. Tyagi SPet al (1992)[40] had recorded a higher incidence of 6.2%.

e) Eosinophilic cholecystitis and Lymphoeosinophilic cholecystitis: In our study we found 4 cases (i.e. 0.61%) of eosinophilic cholecystitis and 2 cases (i.e. 0.30%) of lymphoeosinophilic cholecystitis.
Lymphoeosinophilic cholecystitis was seen female patients while eosinophilic cholecystitis showed male to female ratio of 1:1.

Lymphoeosinophilic cholecystitis was found in 41-50 years age group and in age group more than 60 years. While eosinophilic cholecystitis was found maximum in 41-50 years age group.

Lymphoeosinophilic cholecystitis was associated with cholesterol stones. Eosinophilic cholecystitis was associated with pigmented stones. In addition, one case was showing pyloric metaplasia.Mohan et al (2005)[11] found eosinophilic cholecystitis in 6 cases (0.5%) out of 1100 cases. This finding correlated well with our study.

David Dabbs (1993)[41] analysed 217 cases of which 48 (22.1%) had eosinophils within the inflammatory infiltrate, 48 (22.2%) had minimal change with smatter of lymphocytes, 26(12%) had acute cholecystitis and 93(42.9%) showed chronic cholycystitis. 14 cases (6.4%) were classified as eosinophilic cholecystitis. 10 females and 4 males had this

lesion and the age range being 15-97 years. 17 (7.83%) cases were diagnosed as lymphoeosinophilic cholecystitis based on the ratio of eosinophilic and lymphocytic infiltrate. The study concluded that lymphoeosinophilic cholecystitis and eosinophilic cholecystitis are more common than previously diagnosed and likely represent idiosyncratic allergic reaction that are possibly due to disturbance in motility that causes stasis or toxic alteration of biliary composition.

f) Gangrene of gallbladder: In our study there were just 2 cases of gangrene of gallbladder in age group of 31 to 70 years. The male: female ratio was 1:1. One case was associated with presence of stone and microscopy suggestive of gangrene.

Merriam L et al (1999)[42] found 27 cases (18%) of gangrenous cholecystitis out of 417 cases.We found less number of cases of gangrene.

g) Hyperplastic lesions and polyps in gallbladder: We in our study found 5 cases of Hyperplastic and polypoidal lesion of which one was of cholesterol polyp, two were adenomas, one was papillary hyperplasia and one was adenomatous hyperplasia. Incidence of hyperplastic and polypoidal lesions in our study was 0.76%. Three cases were associated with chronic cholecystitis.

Pavlidis T et al (2000)[33] noted an incidence of 0.5% for gallbladder polyps which was close to what was seen in our study.

Sadao K et al (1982)[43] studied 1605 cases of cholecystitis. In these he found 11 cases of benign adenomas, 7 cases adenoma with malignant changes and 79 invasive carcinomas. He noted that size of adenoma correlated well with the histopathological findings. All benign adenomas were less than 12 mm, while the adenomas having cancerous foci were 12 mm or more in diameter. Most invasive carcinomas were more than 30 mm in diameter.

Mazlum et al (2010)[12] studied 1500 cases. He found 22(1.4%) cases of cholesterol polyp, 8(0.53%) cases of adenomyoma and 2(0.1%) cases of adenoma.In our study, we found two cases of adenoma (0.30%) which were not associated with malignant changes.

Saavedra J (1980)[44] studied 200 cases of cholecystectomy specimens of which 166(83%) exhibited epithelial hyperplasia, 27(13.5%) atypical hyperplasia and 73(3.5%) carcinoma in situ. Epithelial hyperplasia was observed in 146 gallbladders with male to female ratio 1:7.3. Atypical hyperplasia was seen in 21 females and 6 males. Fundus was the commonest site for atypical hyperplasia.

In our study only one case of papillary hyperplasia was seen and associated with chronic cholecystitis.Adriana L et al (2010)[39] studied 1689 cases of cholecystectomy of which 3(0.2%) showed hyperplastic polyp,17(1.0%) cholesterol polyp and adenomyomatosis 40(2.4%).

h) Malignant lesions of gallbladder: Incidence of gallbladder carcinoma was 0.76% in our studyand close to studies by Joon et al (2008)[46], Mazlum et al (2010)[12].

In all studies, adenocarcinoma was the most common malignancy. Our findings are close to Perpeuto (1979)[47], Saavedra J (1980)[48].

All cases of carcinoma of gallbladder were found in females. The incidence of cancer was seen from 41 years and beyond. Mohan et al (2005)[11] found that maximum number of cases i.e. 7(58.3%) out of 12 the cases of carcinoma in gallbladder were associated with pigmented stones.Out of 5 cases, 4 cases were associated with cholelithiasis. In 3 cases pigmented stones were noted and one case had cholesterol stone.

Clinical symptoms like abdominal pain, fever, vomiting, weight loss was seen in two cases and jaundice was noted in one case. All the cases were diagnosed on histopathology and there was no preoperative suspicion of carcinoma in these cases. All cases showed wall thickening on USG and were diagnosed as chronic cholecystitis. Chih J (1980)[48] studied 48 patients of carcinoma of gallbladder. He found the incidence more in female with male to female ratio being 1:1.8. Mean age of presentation being 71.1 years with range from 42 to 96 years. Of these, 35.4% had associated jaundice at time of presentation. Of all cases 7 cases (14.6%) diagnosed at pathological examination.

Sadao K et al (1982)[43] noted an incidence of 4.9% for gallbladder carcinoma. Mean age of the patients was 64 years. The male to female ratio was found to be 1:3.

Henson et al (1992)[49]listed in surveillance, epidemiology and end result program detailed findings of 3038 cases. Of 2665 confirmed cases, male to female ratio was 1:2.7 with 63% cases beyond 70 years.

Saavedra J (1980)[44] found 42 cases of carcinoma in study of 200 specimens. Of these 37(88%) were female and 5(12%) were males. The mean age was 59 years.31 (83.7%) female and 3(60%) had concomitant lithiasis.

Joon et al (2008)[46] found 9 cases of carcinoma of gallbladder in the study of 1122 cholecystectomy specimen. The male to female ratio was 1:2. Cases were between age group of 27 to 81 years with mean age of 56.7 years.5 (55.5%) cases were associated with cholelithiasis. Abdominal pain (66.7%) followed by vomiting (33.33%) were most common symptoms.

Mazlum et al (2010)[12] found 14 cases of carcinoma of gallbladder out of 1500 cases. Out of 14 cases, 13 were female and one was male.7 cases were associated with gallstones.

Conclusion

Thus, we conclude that

- Variety of lesions can be found if cholecystectomy specimens were examined meticulously.
- Patients usually present with signs and symptoms of long duration and with vague complaints like pain in abdomen, nausea, dyspepsia.
- Most of the cases seen were of chronic calculus cholecystitis. These cases were predominant in females and associated mostly with pigmented stones.
- Most cases of metaplasia and hyperplasia were seen in association with chronic cholecystitis.
- All cases of carcinoma gallbladder were missed on clinical examination and ultrasonography. Diagnosis was established on histopathology.
- Dr. Vinod Mahajan and Dr. Ashish Jawarkar were involved in case collection and analysis of data. Dr B. N. Hiwale helped in microscopy and interpretation of lesions.This study was the result of collective effort of the three of us.
- The essence from this study is that there are many unsuspected lesions that can be picked up by histopathology. A thorough examination of each and every cholecystectomy specimen is a must, especially to rule out carcinoma which can prove fatal for the patient.

Findings: Nil; **Conflict of Interest**: None initiated
Permission from IRB: Yes

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How to cite this article?

Mahajan V.R, Jawarkar A.V, Hiwale B.N. Clinicopathological profile of cholecystectomy specimens-a retrospective and prospective study. Trop J Path Micro 2018; 4(6):455-465.doi:10.17511/jopm.2018.i06.07.

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