

A HISTOPATHOLOGICAL STUDY OF GALL BLADDER SPECIMENS IN A TERTIARY CARE HOSPITAL IN ASSAM

Sarat Das¹, Rubul Das², Prantika Gogoi³, Manish Das³, Abhisekh Bhowal⁴, Kunwar Karunendra Pratap Singh⁴

Received : 10/08/2023
Received in revised form : 15/09/2023
Accepted : 28/09/2023

Keywords:

Gall bladder, Chronic cholecystitis, cholesterolosis, adenocarcinoma.

Corresponding Author:

Dr. Sarat Das,
Email: drsaratdas.das@gmail.com

DOI: 10.47009/jamp.2023.5.5.320

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2023; 5 (5); 1629-1633



¹Associate Professor, Department of Pathology, Jorhat Medical College and Hospital, Jorhat, Assam, India

²Assistant Professor, Department of Surgery, Jorhat Medical College and Hospital, Jorhat, Assam, India

³2ndYear Post Graduate Trainee, Department of Pathology, Jorhat Medical College and Hospital, Jorhat, Assam, India

⁴2ndYear Post Graduate Trainee, Department of Surgery, Jorhat Medical College and Hospital, Jorhat, Assam, India

Abstract

Background: Gall bladder is one of the most common organs to be surgically resected. The histological spectrum of gall bladder lesions ranges from chronic cholecystitis to gall bladder cancer. We planned this research to study the histopathological spectrum of gall bladder lesions that commonly affect the gall bladder. **Materials and Methods:** It was a retrospective study conducted in the Department of Pathology in a tertiary care hospital in Assam. Laparoscopic and open cholecystectomy specimens of the gall bladder were obtained between April 2021 and March 2023. The patient's age, gender, and clinical information were all recoded. 1272 samples in total were examined. The samples were preserved for 24 hours in 10% formalin. Hematoxylin and eosin stain was used to stain the sections after processing, and they were then examined under a microscope. **Result:** On histopathological examination, maximum cases were of chronic cholecystitis (1018 cases, 80%), 182 cases had cholesterolosis(14.3%), followed by acute cholecystitis (48 cases,3.7%), adenocarcinoma of gall bladder(9 cases,0.7%), xanthogranulomatous cholecystitis (7cases,0.5%), follicular cholecystitis (5 cases,0.3%), and one case of intracholecystic papillary neoplasm of gall bladder, porcelain gall bladder and empyema each. **Conclusion:** The present study unfolded a wide variety of gall bladder lesions. The spectrum ranged from chronic cholecystitis to gall bladder carcinoma. Incidental finding of gall bladder carcinoma is not uncommon. Therefore, a proper histopathological examination of all excised gall bladder specimens is necessary.

INTRODUCTION

The spectrum of gall bladder diseases includes congenital, inflammatory and neoplastic lesions. It is one of the most common organs to be surgically resected.^[1]

Gall bladder is a pear-shaped organ that lies in a shallow fossa on the visceral surface of right hepatic lobe measuring up to 10 cm in length and 3–4 cm in width, and the thickness of gall bladder wall is 1-2 mm. It has a volume of about 40 – 70 ml. It has three parts namely neck, body and fundus. Histologically the gall bladder wall comprises of mucosa, smooth muscle, subserosal connective tissue and the serosa.

Cholelithiasis is the most common etiology associated with gall bladder diseases. In India, the

prevalence of gallstone disease is 2 to 29% whereas in western world it is 10 %- 20%.^[2]The incidence is 2–4 times higher in women than in men. Gall stones causes irritation of the epithelium and is the underlying cause of pre-neoplastic conditions which ultimately leads to neoplasia. Gall bladder carcinoma is asymptomatic. The 5-year relative survival rate is 66% if there is no local or distant metastasis. If the cancer has metastasized the 5-year relative survival rate is 28%.^[3]

Therefore, histopathological workup is very important for prompt detection of malignant as well as the premalignant lesions which may appear unremarkable grossly.

The aim of the study was to study the histopathological spectrum of gall bladder lesions that commonly affect the gall bladder.

MATERIALS AND METHODS

It was a retrospective study conducted in the Department of Pathology in a tertiary care hospital in Assam. Laparoscopic and open cholecystectomy specimens of the gall bladder were obtained between April 2021 and March 2023. The patient's age, gender, and clinical information were all recorded. 1272 samples in total were examined. The samples that had been autolyzed and those whose medical records were lacking were not included in the study. The samples were preserved for 24 hours in 10% formalin. The sections from the body, fundus, and neck or cystic duct were submitted. Additional sections were taken from mucosa that appears abnormal or if any mass-forming tumour is found, sections were taken from the tumour along with the surgical cut margin. Hematoxylin and eosin stain was used to stain the sections after processing and they were then examined under a microscope.

RESULTS

A total of 1272 gall bladder specimens were received within 2 years. 1062 specimens were obtained from females and 210 were from males. The male to female ratio is 1:5. [Table1]

The age of the patients ranged from 8 to 89 years. 30 to 39 years is the commonest age group to be affected by gall bladder diseases (348 cases). The mean age of presentation being 39.46 years. [Figure1]

On histopathological examination, maximum cases were of chronic cholecystitis (1018 cases), 182 cases had cholesterols, followed by acute cholecystitis (48 cases), adenocarcinoma of gall bladder (9

cases), xanthogranulomatous cholecystitis (7 cases), follicular cholecystitis (5 cases), and one case of intracholecystic papillary neoplasm of gall bladder, porcelain gall bladder and empyema each. [Table2&Figure 2 to 8]

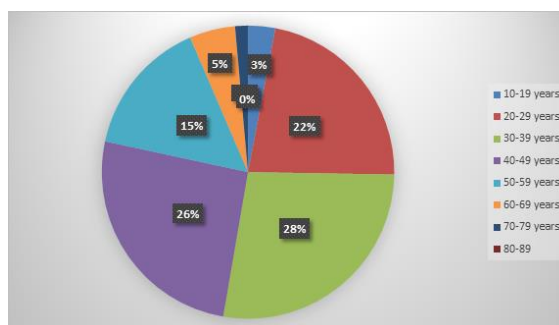


Figure 1: Age distribution of patients

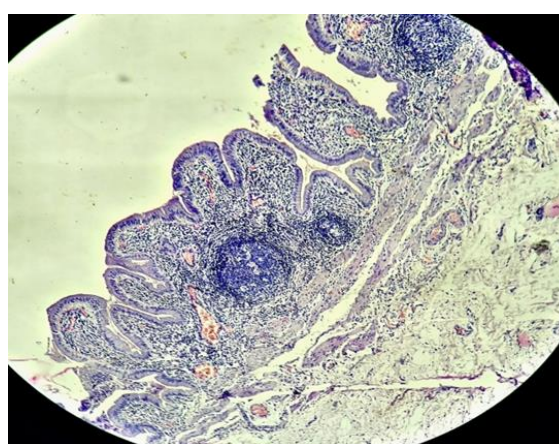


Figure 2: Follicular cholecystitis showing lymphoid follicles forming germinal centres in the wall of gall bladder (10 x)

Table 1: Sex distribution of patients

S.No.	Sex	No of gall bladder specimen (Total Number n=1272)
1	Female	1062 (83.4 %)
2	Male	210(16.6%)

Table 2: Histopathological spectrum of gall bladder specimens.

S.No.	Histopathological diagnosis	Most common age group affected(years)	Male (Total Number n1=210)	Female(Total Number n2=1062)	Total Number n=1272
1	Chronic cholecystitis	30 – 39	161	857	1018 (80%)
2	Chronic cholecystitis with cholesterosis	40 – 49	35	147	182 (14.3 %)
3	Acute cholecystitis	40-49	9	39	48 (3.7%)
4	Adenocarcinoma of gall bladder	50-69	2	7	9 (0.7%)
5	Xanthogranulomatous cholecystitis	50 -59	3	4	7 (0.5%)
6	Follicular cholecystitis	30-39	2	3	5 (0.3%)
7	Intracholecystic papillary neoplasm of gall bladder	60 -69	0	1	1 (0.07%)
8	Porcelain gall bladder	50 -59	0	1	1 (0.07%)
9	Empyema	30 - 39	0	1	1 (0.07%)



Figure 3: Strawberry gall bladder in cholesterosis

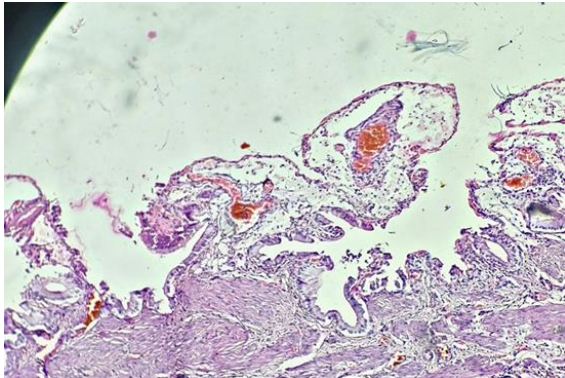


Figure 4: Chronic cholecystitis with cholesterosis (10x)

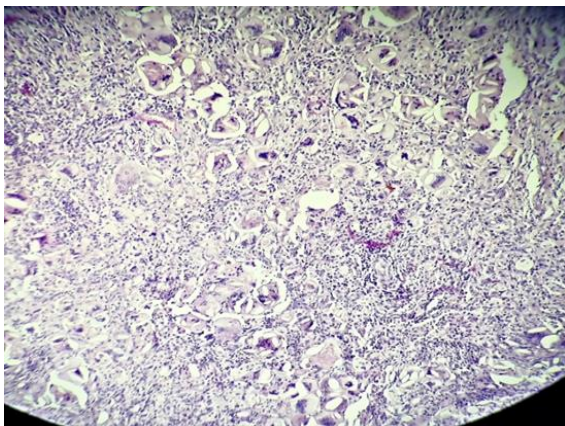


Figure 5: Xanthogranulomatous cholecystitis (10 x)

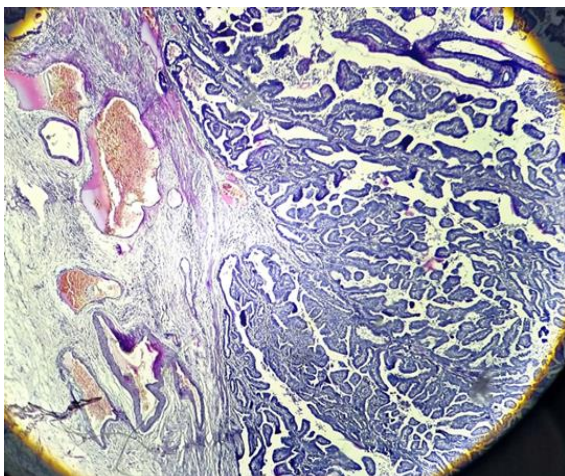


Figure 6: Intracholecystic papillary neoplasm biliary type with low grade dysplasia.(10 x)



Figure 7: Gall bladder adenocarcinoma showing papillary growth.

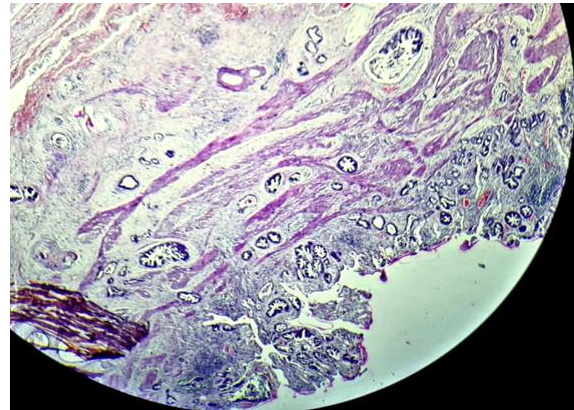


Figure 8: Well differentiated adenocarcinoma of gall bladder. (10 x)

DISCUSSION

Cholecystectomy is a widely performed surgery for the various gall bladder pathologies. The histopathological spectrum of gall bladder specimens are varied wide range of diseases from non-neoplastic to malignant lesions.

Gender: Mostly female is suffering from Gall bladder diseases as compared to male. It has been postulated that the GB mucosa has estrogen and progesterone receptors which may promote akinesia leads to increased exposure of mucosa to bacterial and chemical toxins which further causes stone formation.⁴ In our study the females (83.4%) are affected more than the males (16.6%) and male to female ratio is 1: 5 which is consistent with Devi B et al, Gupta K et al, Kotasthane VD et al.

Age: According to our study, neoplastic diseases of gall bladder were more common after 50 years while thenon-neoplastic diseases were more common before 50 years although the age of presentation of acute cholecystitis varies depending on the etiology (calculous or acalculous). Similar results were found in other studies. The average age of gall bladder cancer at diagnosis in India was above 50 years. The mean age is 50–55 years.^[4]

Spectrum: Chronic cholecystitis is the most common pathology of gall bladder according to our study (80%). Similar findings were found in the studies of Kotasthane VD et al 5, Devi B et al 6 and Gupta K et al.^[1] It is mainly associated with

cholelithiasis. Grossly they may appear swollen, shrunken or with normal size. The wall may be thickened. Microscopically the mucosa is chronically inflamed with infiltration of predominantly mononuclear cells along with few eosinophils associated with muscle hypertrophy or fibrosis and Rokitansky aschoff sinus.

Cholesterosis is the accumulation of lipid filled macrophages in the lamina propria. Grossly it depicts strawberry mucosa. In our study cholesterosis was observed in 14.3% of the cases. It is 5.81%, 2.5%, and 7.1 % in the studies of Kotasthane VD et al,^[5] Devi Bet al,^[6] and Kamna Gupta et al,^[1] respectively. The prevalence in our study are noted to be slightly higher.

Acute cholecystitis grossly shows a distended and edematous gall bladder with presence of exudate and the serosa may appear discolored, hemorrhagic with engorged subserosal vessels. The wall is often thickened (up to 2 cm). Mucosal ulcerations may be present. The gallbladder lumen is filled with bile, hemorrhagic material, and/or turbid fluid. Microscopically there is edema, congestion, hemorrhage, and fibrin deposition. The mucosa is often eroded. In our study 3.7% cases showed acute cholecystitis. It was 1.16%, 6.45% and 3.5% respectively according to Kotasthane VD et al, Gupta K et al and Devi B et al.^[1,5,6]

Empyema is a pus-filled gallbladder with obstructed cystic duct, is a severe form of acute cholecystitis which shows mucosal erosion and neutrophils. In this study empyema was observed in 0.07% of the cases which is similar to study done by Devi B et al (0.5%).^[6]

Xanthogranulomatous cholecystitis shows cholesterol and foamy macrophages microscopically. The foamy macrophages are typically intermingled with other inflammatory cells such as lymphocytes, plasma cells, and Touton-like or foreign body-type large cells (sometimes with cholesterol crystals). Only 0.5% of the cases in our study had xanthogranulomatous cholecystitis. Similar findings were found in studies by Kotasthane VD et al,^[5] Gupta K et al,^[1] and Devi Bet al,^[6] which showed 2.33 percent, 2.07 percent, and 2.5 percent, respectively, in their respective populations.

Follicular cholecystitis is characterized by formation of lymphoid follicles in all layers of the gallbladder wall. In our study 0.3% cases showed follicular cholecystitis while Gupta K et al,^[1] Saka B et al,^[7] showed 2.55 and 2.5 % respectively.

Gallbladders with marked diffuse calcification are known as porcelain gallbladder and it is associated with inflammation. Porcelain gallbladder is a relatively rare condition with an incidence rate of 0.06 to 0.8%.^[8] In our study 0.07% cases showed the presence of porcelain gall bladder. It is associated with high risk of malignancy.

Intracholecystic papillary neoplasm is a premalignant lesion which is grossly mass-forming, non-invasive epithelial neoplasm arising in the

mucosa, projecting into the lumen of the gallbladder typically fragile and smaller ones may detach from the wall. Microscopically they are papillary, tubular, or tubulopapillary, with varying degree of dysplasia. They are of biliary, gastric, foveolar, oncocytic, pyloric, and intestinal type. It is found in 0.4 % and 1.5% of cholecystectomies according to the studies done by Adsay V et al,^[9] and Yasuni et al.^[10] In our study 0.07% cases showed the presence of intracholecystic papillary neoplasm.

Assam was found to have the highest incidence of gall bladder cancer in both men and women. In the North-East, it has been found that women are more likely than men to develop gall bladder cancer. There are many potential risk factors for gall bladder carcinoma in this area, including the presence of heavy metals like iron, lead etc., pesticides, aromatic hydrocarbons, nitrosamines, nitro group chemicals, in some areas' groundwater and the Brahmaputra and Ganga rivers, as well as the potential presence of adulterants in the edible mustard oil used for cooking in the country's NE regions. One of the causes of gall bladder cancer is bacterial infection, which results in chronic inflammation and bile acid breakdown. These risk variables were closely associated to the Salmonella typhi infection, which is very common in particular areas of northeast.^[11]

In our study 0.7 % cases had adenocarcinoma of gall bladder. Previous studies showed range of prevalence from 0.5% to 1.05%.^[11]

CONCLUSION

The present study unfolded a wide variety of gall bladder lesions. Of these, chronic cholecystitis is the most prevalent. The most common age group to be affected by the nonneoplastic gall bladder diseases is below 50 years while the neoplastic lesions are more common after 50 years. Females are affected more than males. Despite the emergence of new technology, gall bladder cancer is usually diagnosed late and therefore it has poor prognosis. Incidental finding of gall bladder cancer is not uncommon. But with proper histopathological and radiological investigations, it is possible to timely diagnose it and necessitate proper management and better outcome.

REFERENCES

1. Gupta K, Faiz A, Thakral RK, Mohan A, Sharma VK. The spectrum of histopathological lesions in Gallbladder in cholecystectomy specimens. *Int J Clin Diagn Pathol*. 2019 Jan 1;2(1):146–51.
2. Srinivasan G, Sekar ASI. Study of histopathological spectrum of gallbladder in cholecystectomy specimens. *International Journal of Research in Medical Sciences*. 2019 Jan 25;7(2):593–9.
3. Cancer.Net [Internet]. 2012 [cited 2023 Jun 22]. Gallbladder Cancer - Statistics. Available from: <https://www.cancer.net/cancer-types/gallbladder-cancer/statistics>

4. Dutta U, Bush N, Kalsi D, Popli P, Kapoor VK. Epidemiology of gallbladder cancer in India. *Chin Clin Oncol*. 2019 Aug;8(4):33.
5. Kotasthane VD, Kotasthane DS. Histopathological spectrum of gall Bladder diseases in cholecystectomy specimens at a Rural tertiary hospital of Purvanchal in North India-Does it differ from South India? *IP Archives of Cytology and Histopathology Research*. 2020 Mar 15;5(1):91–5.
6. Devi B, Shetty J, Jose V. Histopathological Spectrum of Diseases in Gall bladder. *Natl J Lab Med*. 2017 Jun;6(4):6–9.
7. Saka B, Memis B, Seven IE, Pehlivanoglu B, Balci S, Bagci P, et al. Follicular Cholecystitis: Reappraisal of Incidence, Definition, and Clinicopathologic Associations in an Analysis of 2550 Cholecystectomies. *Int J Surg Pathol*. 2020 Dec;28(8):826–34.
8. Watanabe Y, Mochidome N, Nakayama H, Gotoh Y, Setoguchi T, Sunami S, et al. Intracholecystic papillary neoplasm associated with invasive carcinoma of the remnant gallbladder after subtotal cholecystectomy: a case report. *Surg Case Rep*. 2022 Feb 21;8:31.
9. Adsay V, Jang KT, Roa JC, Dursun N, Ohike N, Bagci P, et al. Intracholecystic papillary-tubular neoplasms (ICPN) of the gallbladder (neoplastic polyps, adenomas, and papillary neoplasms that are ≥ 1.0 cm): clinicopathologic and immunohistochemical analysis of 123 cases. *Am J Surg Pathol*. 2012 Sep;36(9):1279–301.
10. Nakanuma Y, Nomura Y, Watanabe H, Terada T, Sato Y, Kakuda Y, et al. Pathological characterization of intracholecystic papillary neoplasm: A recently proposed preinvasive neoplasm of gallbladder. *Ann Diagn Pathol*. 2021 Jun 1;52:151723.
11. Shanker N, Mathur P, Das P, Sathishkumar K, Shalini AJM, Chaturvedi M. Cancer scenario in North-East India & need for an appropriate research agenda. *Indian J Med Res*. 2021 Jul;154(1):27–35.