Indian Journal of Pathology and Oncology 2024;11(4):357–363

Content available at: https://www.ipinnovative.com/open-access-journals

Indian Journal of Pathology and Oncology

Journal homepage: www.ijpo.co.in

Original Research Article

Study of histopathological spectrum of lesions of gall bladder with clinico radiological correlation

Devika Suresh Borade[1]*, Sujata R Kanetkar[1], Nanda J Patil[1], Sunil V Jagtap[1]

[1]*Dept. of Pathology, Krishna Institute of Medical Sciences, Karad, Maharashtra, India*

ARTICLE INFO

Article history:
Received 30-08-2024
Accepted 15-10-2024
Available online 12-12-2024

Keywords:
Gallbladder
Adenocarcinoma
Cholecystitis
Ultrasonography

ABSTRACT

Background: The gallbladder is frequently affected by a spectrum of diseases, ranging from benign inflammatory conditions to aggressive malignancies. Histopathological examination is the cornerstone of diagnosing gallbladder diseases, providing detailed insights into the cellular and tissue-level changes that occur in various conditions. However, the diagnostic process is significantly enhanced when histopathological findings are correlated with clinical and radiological data. Such a multidisciplinary approach not only improves diagnostic accuracy but also improves treatment strategies, leading to better patient outcomes.

This study aims to investigate the histopathological spectrum of gallbladder lesions and to establish correlations with clinic-radiological findings, thereby advancing the understanding of gallbladder pathology and its management.

Aim and Objectives: To study the histopathological spectrum of lesions of gall bladder with clinic radiological correlation

Result: The most common histopathological diagnosis was chronic non specific cholecystitis with cholelithiasis seen in 48 cases out of 100 cases (48%). Total 70 cases out of 100 (70%) were calculous out of which 65.71% cases were of chronic cholecystitis, 24.28% cases were of acute cholecystitis and 10% cases were of gall bladder carcinoma with n=70. Out of 100 cases, 90% cases had mixed stones, 7.15% cases had cholesterol stones and 2.85% cases had pigment stones.

There were 7 cases (7%) of gall bladder carcinoma amongst 100 cases. All 7 cases were of adenocarcinoma of the gall bladder out of which 2 cases showed serosal invasion and infiltration.

Conclusion: Multidisciplinary approach is required in the diagnosis and management of gall bladder diseases, integrating clinical, radiological and histopathological findings to ensure accurate diagnosis. Each and every cholecystectomy specimen must be sent for histopathological examination and studied meticulously, as some unusual findings bearing implications on treatment and prognosis may be seen, regardless of the reason for which cholecystectomy is performed.

1. Introduction

The gall bladder is a foregut organ affected by a wide range of pathological diseases, including cholelithiasis, inflammatory lesions, pre-malignant lesions and malignant lesions.[1]

Cholelithiasis is the predominant condition, constituting over 95% of all gallbladder diseases. Gall Bladder Carcinoma (GBC) exhibits regional disparities within the country. The cancer data of studies from northern India showed GBC accounting for 9.6% of all cancers in females and was the third leading site of cancer whereas studies from eastern India recorded gall bladder cancer between 5.8% to 6.0% of all cancers.[2]

* *Corresponding author*.
E-mail address: devikaborade93@gmail.com (D. S. Borade).

https://doi.org/10.18231/j.ijpo.2024.078

Histopathological examination has traditionally been a cornerstone of diagnostic procedures, alongside the increasingly recognized value of clinical and radiological correlation being valuable diagnostic tools. Various imaging techniques are utilized to evaluate the gallbladder diseases. Ultrasound has traditionally been the preferred initial method for suspected gallbladder issues, with computed tomography increasingly employed. Magnetic resonance imaging serves as a problem-solving tool. Advancements like contrast-enhanced ultrasound and advanced MRI sequences enhance diagnostic accuracy, aiding in distinguishing between benign and malignant gallbladder conditions.[3]

Laboratory workup such as complete blood count, liver-function testing, serum cholesterol levels, random blood sugar levels etc should be included to help distinguish the etiology of gall bladder diseases and identify associated complications.[4]

For accurate diagnosis of gallbladder diseases, histopathological examination is considered the gold standard method. Histopathological studies influence treatment decisions, prognosis, and patient outcomes. Thereby, using both traditional and modern diagnostic procedures, medical practitioners can perform appropriate surgical procedures to improve patient survival rates and prognosis of the patients.

2. Aim and Objectives

To study the histopathological spectrum of lesions of gall bladder with clinicoradiological correlation

3. Material and Methods

3.1. Source of data

This was a cross sectional study carried out a tertiary care hospital, conducted over a period of 24 months from July, 2022 to June, 2024. Thus, it included 100 cholecystectomy specimens.

3.2. Inclusion criteria

All surgically resected gall bladder specimens that were received in the histopathology section of the Department of Pathology from July, 2022 to June, 2024 were included.

3.3. Exclusion criteria

There were no exclusion criteria in this study

3.4. Method of data collection

The specimens were collected in 10% formalin following scrutiny and confirmation of patient details and identity. Overnight fixation in formalin was carried out. Gross examination of the specimens were done. Bits from one representative full thickness section from the fundus, one through the body, one through neck of the gall bladder and one cross section of the cystic duct margin were taken. Additional sections were taken when focal lesions were present. They were followed by routine paraffin processing.

4. Result

The study included a total of 100 prospective cases of cholecystectomy specimens of two years from July 2022 to June 2024. Out of 100 cholecystectomies, 82 were performed laparoscopically (82%), while 18 cases (18%) underwent open laparotomy cholecystectomies.

Maximum number of patients were in the age group of 61-70 years of age (25%) followed by 51-60 years of age (19%). Maximum patients were females comprising a total of 54 cases out of 100 (54%) and remaining 46 cases were male (46%). Females were common in the age group of 31-40 years of age (21.82%). Males were common in the age group of 61-70 years of age (33.33%).

Mean age of patient was 54 years. Oldest patient was 81 years old and youngest patient was 15 years old.

In the present study, 62 cases (62%) were non-vegetarian, 37 cases (37%) were vegetarian and 1 case (1%) was eggetarian.

The most common clinical presentation in cholecystectomy cases was abdominal pain noted in 87 cases out of total 100 cases (87%). The most prevalent weight category was between 51-60 kg, accounting for 35% of the total cases. Mean body weight was 61 kg. Minimum weight was 39 kg. Maximum weight was 88 kg. Average BMI of patients in study was 25.22 kg/$m^2$and was higher which was statistically significant with Odds Ratio of 1.21.

Random blood sugar was performed in all 100 patients, out of which diabetic patients constituted 20 cases (20%). Diabetes proved to be an important risk factor for development of gall bladder diseases with statistically significant Odds Ratio (2.49). TLC was performed in all 100 cases. Higher values of Total Leucocyte count were noted in 67/100 cases (67%). Serum cholesterol levels were performed in all 100 cases. Higher values of serum cholesterol levels were noted in 5 cases (5%). Serum bilirubin levels were performed in all 100 cases. Higher values of serum bilirubin were noted in a total of 12 cases (12%). Amongst 12 cases, 10 cases (83.33%) with elevated serum bilirubin levels showed gall stones whereas 2 cases (16.66%) did not reveal the presence of gall stones. Serum Alkaline Phosphatase levels were performed in 27 cases only out of 100 and was raised in 14 out of 27 cases (51.85%).

Out of total 100 cases, 42 patients (42%) were chronic alcoholics. Amongst the 42 cases of alcohol consuming patients, 35 patients were male (83.33%) and 7 patients were female (16.66%). Amongst the 42 cases of alcohol consuming patients, 5 patients had deranged liver function

test values (11.90%). Positive association of gall stones with history of chronic alcohol consumption was noted in cholecystectomy patients with Odds Ratio of 3.11.

Chronic non-specific cholecystitis with cholelithiasis was the most common histopathological diagnosis condition with 48 cases out of 100 (48%).

Majority cases showed the presence of mixed gall stones.

Ultrasonography successfully detected cases of chronic cholecystitis and acute cholecystitis but out of a total of 7 cases of gall bladder carcinoma, ultrasonography diagnosed neoplastic etiology in only 6 cases and 1 case was diagnosed incidentally on histopathological examination. Carcinoma of the gall bladder comprised a total of 7 cases (7%) in the present study. All 7 cases (100%) were of adenocarcinoma of the gall bladder. Amongst the 7 cases of adenocarcinoma of the gall bladder, 2 cases (28.57%).

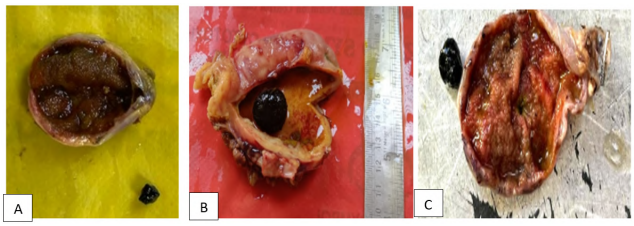

Figure 1: A-C): Shrunken, contracted gall bladders with chronic calculous cholecystitis with mixed stone

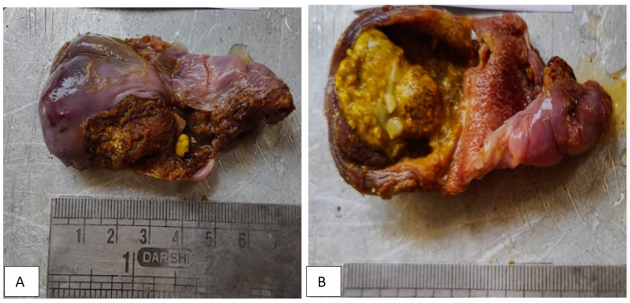

Figure 2: A, B): Chronic cholecystitis with cholelithiasis with cholesterol stone

Table 1 showed Chronic non-specific cholecystitis with cholelithiasis, the most common condition with 48 cases followed by Acute Acalculous cholecystitis, constituting 23 cases. Carcinoma of the gall bladder comprised a total of 7 cases.

Out of 100 cases, 7 cases (7%) were of gall bladder carcinoma.

1. Youngest patient was 37 years old and oldest patient was 75 years old.
2. On ultrasonography, case 6 was diagnosed as Chronic Calculous Cholecystitis, pointing towards inflammatory etiology of the gall bladder.

Table 1: Distribution of cholecystectomy specimens according to histopathological diagnosis

Type of pathology	No. of cases	Percentage
Chronic non-specific cholecystitis with cholelithiasis	48	48%
Chronic non-specific cholecystitis	6	6%
Acute on chronic non-specific cholecystitis with cholelithiasis	4	4%
Acute acalculous cholecystitis	23	23%
Adenocarcinoma of the gall bladder	7	7%
Gangrenous cholecystitis with peritonitis	7	7%
Adenomatous hyperplasia of gall bladder	1	1%
Xanthogranulomatous cholecystitis	1	1%
Gall bladder adenoma	1	1%
Eosinophilic cholecystitis	1	1%
Cholecystitis Follicularis	1	1%
Total	100	100%

Table 2: Comparison of radiological diagnosis with histopathological diagnosis

Radiological diagnosis	Histopathological diagnosis
Ultrasonography ; features suggestive of cholecystitis – 87/100 cases	86/100 cases could correlate with radiological and histopathological diagnosis of Cholecystitis. This included acute and chronic calculous as well as acalculous cholecystitis. However, histopathological examination could detect 1 case of Incidental Gall Bladder Carcinoma (Moderately differentiated adenocarcinoma of gall bladder – Biliary type) in a patient radiologically diagnosed as Cholecystitis.
Ultrasonography ; Wall thickening, heterogenous lesion, suggestive of neoplastic etiology – 6/100 cases	All 6 cases could correlate with radiological and histopathological diagnosis of Neoplastic etiology viz Carcinoma of the gall bladder. A single case missed by Ultrasonography and diagnosed radiologically as Cholecystitis was detected by Histopathological examination as Incidental Gall bladder carcinoma (Moderately differentiated adenocarcinoma of gall bladder – Biliary type)

Table 3: Analyses of gall bladder carcinoma cases

	Case 1	**Case 2**	**Case 3**	**Case 4**	**Case 5**	**Case 6**	**Case 7**
Age and sex	56 male	50 female	45 female	65 female	37 female	75 female	37 female
Clinical presentation	Weight loss since 2 months.	Weight loss since 4 months.	Weight loss since 3 months.	Loss of weight and loss of apetite since 2 months.	Weight loss since 1 year	Weight loss since 3 months	Weight loss and loss of apetite since 1 year
Radiological findings	USG – Cholecystitis with wall thickening of gall bladder, suggestive of neoplastic etiology..	USG- Cholecystitis with intramural growths in gall bladder in fundus and body region, suggestive of carcinoma.	USG - Wall thickening of gall bladder, shows exophytic mass, along with cholecystitis	USG- Heterogenous lesion with wall thickening, suggestive of neoplastic etiology. Evidence of small calculi and sludge in lumen, wall edema.	USG – Cholecystitis with wall thickening of gall bladder, suggestive of neoplastic etiology	USG - F/S/O Cholecystitis	USG – thinned out mural wall, heterogenous lesion, suggestive of neoplastic etiology. Evidence of calculi, sludge, pericholecystic fluid.
Lab findings	TLC 10280/ cumm, Total serum bilirubin 1.2 mg/dl, Random BSL 110 mg/dl, Serum cholesterol 181 mg/dl, ALP 50/ IU/L	TLC 11000/ cumm, BSL 105 mg/dl, Total serum bilirubin 1.3 mg/dl, Serum cholesterol 167 mg/ dl, ALP 250/ IU/L	TLC 11200/ cumm, Total serum bilirubin 1.1 mg/dl, Serum cholesterol 176 mg/dl, Random BSL 111 mg/dl, ALP 49/ IU/L	TLC 11250/ cumm, Total serum bilirubin 0.6 mg/dl, Random 110 mg/dl, Serum cholesterol 220 mg/dl	TLC 21540/ cumm, Random BSL 107 mg/dl, Serum cholesterol 156 mg/dl,Total serum bilirubin 0.8 mg/dl	TLC 23000/ cumm, Random BSL 110 mg/dl, Serum cholesterol 120 mg/dl,Total serum bilirubin 0.8 mg/dl	TLC 3500/ cumm, Random BSL 110 mg/dl, Serum cholesterol 120 mg/dl,Total serum bilirubin 0.8 mg/dl
Gross appearance	Infiltrating, irregular grey white tumor, evidence of wall thickening .	Diffuse, nodular growth arising from fundus of gall bladder.	Exophytic growth arising from fundus of gall bladder	Irregular grey white tumor on cut section.	Grey white nodular mass in fundus of gall bladder, notable thickening of wall of gall bladder.	Diffuse, irregular thickening of wall at the fundic region of the gall bladder.	Perforated area at body of gall bladder, numerous mixed pigment stones, grey white mass at fundus region of gall bladder.
Histopathological diagnosis	Clear cell adenocarcinoma -	Biliary type - Moderately differentiated adenocarcinoma	Moderately differentiated adenocarcinoma - Biliary type	Moderately differentiated adenocarcinoma - Biliary type	Well differentiated adenocarcinoma	Moderately differentiated adenocarcinoma – Biliary type, tumor was seen infiltrating upto serosa	High grade malignancy- poorly differentiated adenocarcinoma invading through serosa
Patient outcome	Improved	Improved	Improved	Improved	Improved	Improved	Deceased

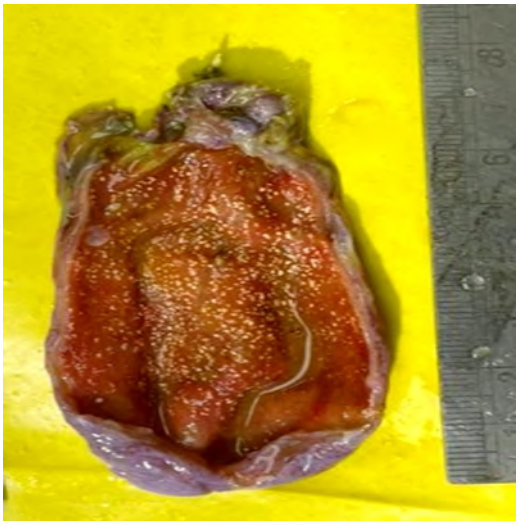

Figure 3: Strawberry gall bladder

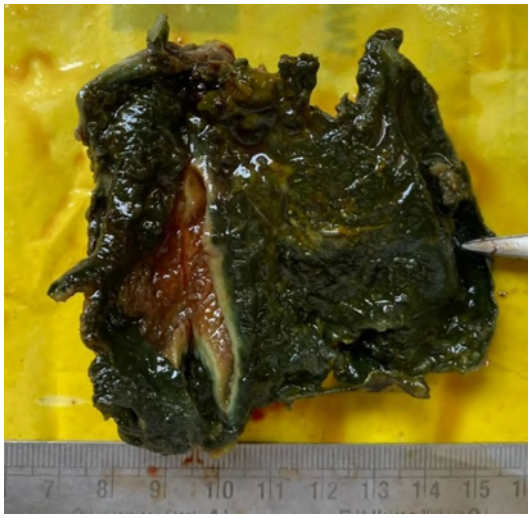

Figure 4: Gangrenous gall bladder

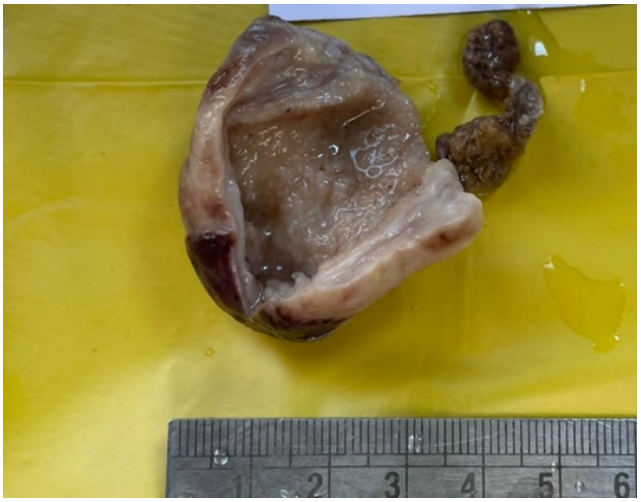

Figure 5: Clinically and radiologically diagnosed as a case of Chronic cholecystitis showing diffuse thickening at fundic region of gall bladder. Gall bladder carcinoma was diagnosed incidentally on histopathological examination, thus highlighting the importance of microscopic examination for all routine cholecystectomy specimens

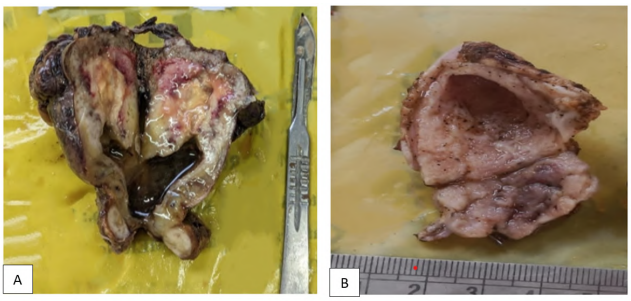

Figure 6: Gall bladder carcinoma specimens with diffuse gall bladder wall thickening and grey white tumor on cut section

3. Case 6 on gross examination of the specimen of gall bladder revealed a diffuse, irregular thickening at the fundic region of the gall bladder. Microscopically, it showed Moderately differentiated adenocarcinoma – Biliary type, tumor was seen infiltrating upto serosa thus highlighting the importance of histopathological examination for all routine cholecystectomy specimens.

5. Discussion

Findings of age and gender distribution were in concordance with studies of Mondal B et al,[6] Dattal DS et al.,[7] Agrawal R et al.,[8] Almas T et al.,[9] with having female preponderance amongst gall bladder diseases.

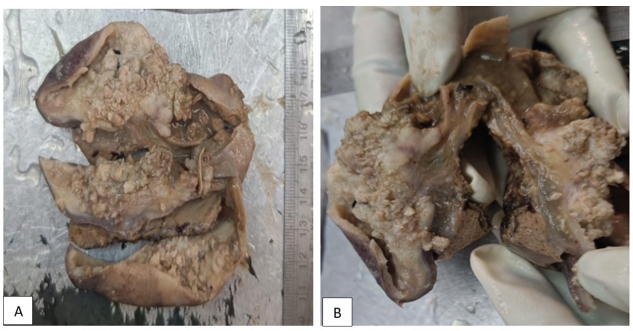

Figure 7: A, B): Gall bladder carcinoma specimen with ulceroinfiltrative growth replacing body and neck of gall bladder and infiltrating serosa

Table 4: Comparison of distribution of different types of gall bladder pathologies

Type of pathology	Kotasthane et al,[2] 2020	Savanur et al,[5] 2022	Present study, 2024
Chronic non-specific cholecystitis with cholelithiasis	63.26%	55%	48%
Chronic non-specific cholecystitis	10%	4.4%	6%
Acute on chronic non-specific cholecystitis with cholelithiasis	1.16%	4%	4%
Acute acalculous cholecystitis	13.95%	33%	23%
Adenocarcinoma of the gall bladder	2.33%	0.2%	7%
Gangrenous cholecystitis with peritonitis	1.16%	0.2%	7%
Adenomatous hyperplasia of gall bladder	-	0.4%	1%
Xanthogranulomatous cholecystitis	2.33%	0.6%	1%
Gall bladder adenoma	-	0.6%	1%
Eosinophilic Cholecystitis	-	0.2%	1%
Cholecystitis Follicularis	-	0.2%	1%

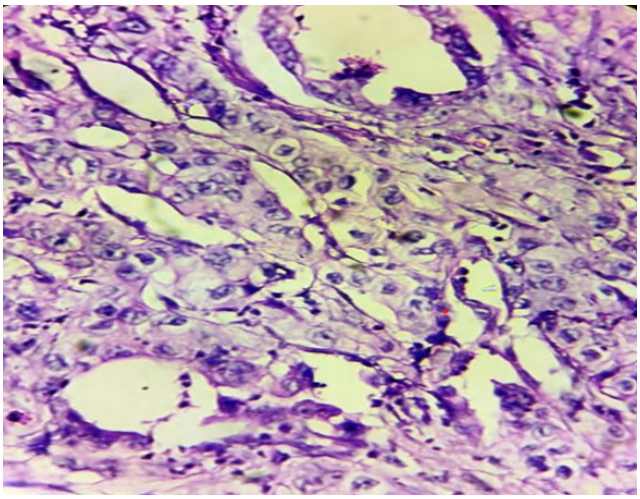

Figure 8: Photomicrograph showing clear cell adenocarcinoma of the gall bladder (400 X H&E)

Gall bladder diseases are more common in non-vegetarian than in vegetarian patients. In the present study, 62% patients were non vegetarian. Findings were in concordance with study of Srinivasan AC et al.,[10] wherein patients consuming a mixed diet were predominant.

Average BMI in this study was 27.81 kg/m^2. Average BMI in study for gall bladder diseases patients was higher than average BMI of normal population which was statistically significant by higher odds ratio. Findings of high BMI in gall bladder diseases patients were in concordance with study of Wegene Borena et al., 2014,[11] Yen Chun Chen et al, 2014[12] and Dara Jokhi C et al, 2019.[13]

The commonest clinical presentation of patients was abdominal pain followed by associated complaint of vomiting. Most common finding of pain was in concordance with other studies done by Festi D et al., 2008,[14] Pradhan SB et al., 2009,[15] Siddique et al., 2013,[16] Yaser Froutan et al., 2015,[17] Sangma MMB et al, 2016.[18]

Significant number of patients with gall bladder disease had higher total leucocyte count, serum bilirubin levels and serum alkaline phosphatase levels. Levels of serum bilirubin were raised in a total of 12 cases out of 100 (12%).

1. Amongst the 12 patients who showed raised serum bilirubin values, 10 patients showed the presence of gall stones (83.33%, where n = 12).
2. 2 patients with raised serum bilirubin levels did not show the presence of gall stones (16.67%, n = 12).

These findings of present study were in concordance with study conducted by Dara Jokhi C et al., 2019.[13]

Present study noted increased incidence of gall bladder diseases in diabetic patients. Present study findings were in concordance with studies conducted by Festi et al., 2008,[14] Yaser Froutan et al., 2015,[17] Dara Jokhi C et al., 2019.[13]

Present study showed alcohol as a causative factor in occurrence of gall bladder disease and this finding was in concordance with study of Rodriguez, Antonio et al.,[19] Study conducted by Byung Hyo Cha et al.,[20] showed that there is an increased incidence of gall stone formation if person is a chronic alcoholic. In present study, amongst the 42 cases of alcohol consuming patients, positive association of gall stones with history of chronic alcohol consumption was noted in cholecystectomy patients.

In present study, out of total 100 cases, 70 cases (70%) showed the presence of gall stones. These findings were in concordance with study conducted by Devi Beena et al., 2017.[21]

In present study, out of total 100 cases, 54 cases (54%) were of chronic cholecystitis. Out of 54 cases, 48 were or chronic cholecystitis with cholelithiasis while 6 cases were of chronic non- specific cholecystitis without the presence of gall stones. Findings were in concordance with study conducted by Savanur et al., 2022.[5]

Distribution of various types of pathologies showed chronic cholecystitis with cholelithiasis (48%) as most

common histopathological diagnosis. Findings were in concordance with studies conducted by Kotasthane et al., 2019,[2] Savanur et al., 2022.[5]

In the present study, 100% of the gall bladder carcinoma cases were of adenocarcinoma of the gall bladder. Findings were in concordance with studies conducted by Dara Jokhi C et al., 2019.[13]

6. Conclusion

Multidisciplinary approach is required in the diagnosis and management of gall bladder diseases, integrating clinical, radiological and histopathological findings to ensure accurate diagnosis. Each and every cholecystectomy specimen must be sent for histopathological examination and studied meticulously, as some unusual findings bearing implications on treatment and prognosis may be seen, regardless of the reason for which cholecystectomy is performed.

7. Ethical Approval

This study was conducted after taking approval from the institute Ethical review board, ref. no. KIMSDU/IEC/07/2022.

8. Source of Funding

None.

9. Conflict of Interest

None.

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 Diagnostic Pathol*. 2019;2:146–51.
2. 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. *Arch Cytol Histopathol Res*. 2020;5(1):91–5.
3. Yu MH, Kim YJ, Park HS, Jung SI. Benign gallbladder diseases: Imaging techniques and tips for differentiating with malignant gallbladder diseases. *World J Gastroenterol*. 2020;26(22):2967–86.
4. Allen SN. Gallbladder disease: pathophysiology, diagnosis, and treatment. *US Pharm*. 2013;38(3):33–41.
5. Savanur K, Dhar R, Sahu S. Study of histopathological spectrum of gallbladder diseases. *Int J Med Sci Clin Res Rev*. 2022;5(5):866–71.
6. Mondal B, Maulik D, Biswas BK, Sarkar GN, Ghosh D. Histopathological spectrum of gallstone disease from cholecystectomy specimen in rural areas of West Bengal, India-an approach of association between gallstone disease and gallbladder carcinoma. *Int J Community Med Public Health*. 2016;3(11):3229–35.
7. Dattal DS, Kaushik R, Gulati A, Sharma V. Morphological spectrum of gall bladder lesions and their correlation with cholelithiasis. *Int J Res Med Sci*. 2017;5(3):840–6.
8. Agrawal R, Srivastava A, Mohan N, Arya A, Sharan J, Singh A. Histomorphological study of mucosal changes in gall bladder a tertiary care centre. *Ind J Pathol Oncol*. 2018;5(3):398–404.
9. Almas T, Murad MF, Khan MK, Ullah M, Nadeem F, Ehtesham M, et al. The Spectrum of Gallbladder Histopathology at a Tertiary Hospital in a Developing Country: A Retrospective Study. *Cureus*. 2020;12(8):e9627.
10. Srinivasan G, Sekar ASI. Study of histopathological spectrum of gallbladder in cholecystectomy specimens. *Int J Res Med Sci*. 2019;7(2):596–9.
11. Borena W, Edlinger M, Bjørge T, Häggström C, Lindkvist B, Nagel G, et al. A prospective study on metabolic risk factors and gallbladder cancer in the metabolic syndrome and cancer (Me-Can) collaborative study. *PLoS One*. 2014;9(2):e89368.
12. Chen YC, Chiou C, Lin MN, Lin CL. The Prevalence and Risk Factors for Gallstone Disease in Taiwanese Vegetarians. *PLoS One*. 2014;9(12):e115145.
13. Jokhi CD, Kanetkar SR, Vohra NV. Study of histopathological findings in gallbladder diseases. *Indian J Pathol Oncol*. 2019;6(4):627–35.
14. Festi D, Dormi A, Capodicasa S, Staniscia T, Attili AF, Loria P, et al. Incidence of gallstone disease in Italy: Results from a multicenter, population-based Italian study (the MICOL project). *World J Gastroenterol*. 2008;14(34):5282–9.
15. Pradhan SB, Joshi MR, Vaidya A. Prevalence of different types of gallstone in the patients with cholelithiasis at Kathmandu Medical College, Nepal. *Kathmandu Univ Med J (KUMJ)*. 2009;7(27):268–71.
16. Siddiqui FG, Memon AA, Abro AH, Sasoli NA, Ahmad L. Routine histopathology of gallbladder after elective cholecystectomy for gallstones: waste of resources or a justified act? *BMC Surg*. 2013;13:26.
17. Froutan Y, Alizadeh A, Mansour-Ghanaei F, Joukar F, Froutan H, Bagheri FB, et al. Gallstone disease founded by ultrasonography in functional dyspepsia: prevalence and associated factors. *Int J Clin Exp Med*. 2015;8(7):11283–8.
18. Sangma MMB, Marak F. Clinicoetiopathological studies of acute cholecystitis. *Int Surg J*. 2016;3(2):914–20.
19. Rodríguez-Fernández A, Gómez-Río M, Medina-Benítez A, Moral JV, Ramos-Font C, Ramia-Angel JM, et al. Application of modern imaging methods in diagnosis of gallbladder cancer. *J Surg Oncol*. 2006;93(8):650–64.
20. Cha BH, Bae JM. Comparison of clinical outcomes of incidental and non- incidental gallbladder cancers: a single-center cross- sectional study. *Asian Pac J Cancer Prev*. 2014;15(3):1281–3.
21. Beena D, Shetty J, Jose V. Histopathological Spectrum of Diseases of Gallbladder. *Natl J Lab Med*. 2017;6(4):6–9.

Author's biography

Devika Suresh Borade, Resident https://orcid.org/0000-0003-3058-6762

Sujata R Kanetkar, Professor and Head

Nanda J Patil, Professor

Sunil V Jagtap, Professor https://orcid.org/0000-0002-4844-7624

Cite this article: Borade DS, Kanetkar SR, Patil NJ, Jagtap SV. Study of histopathological spectrum of lesions of gall bladder with clinico radiological correlation. *Indian J Pathol Oncol* 2024;11(4):357-363.