Original Article

Histopathological Disease Spectrum of Cholecystectomy Specimen: A Retrospective Observational Study

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Abstract:

Background: Gallstone disease is a common surgical problem requiring cholecystectomy. It is known to produce diverse histopathological changes in the gallbladder ranging from acute or chronic inflammation to metaplasias and even malignancies.

Objective: The aim of this study was to emphasize the importance of a detailed microscopic examination and to study the range of histopathological lesions in cholecystectomy specimens.

Methods: This is a retrospective study of 1200 cholecystectomy specimens received in the Department of Pathology, Jahurul Islam Medical College Hospital (JIMCH) over a period of 6 years from January 2017 to December 2022. Clinical details and histopathological data were retrieved from the records. The variety of histomorphological changes in the resected gall bladder was studied.

Results: There were 1200 cases consisting of 516 (43%) males and 684 (57%) females with M;F ratio of 1: 1.33. Maximum number of patients (28.25%) being 41 to 50 years old. Most common clinical symptom were pain in the upper abdomen and right upper back (91.4%). Histopathologically, the most common diagnosis was chronic cholecystitis (66.75%), followed by acute on chronic cholecystitis (26.25%), gangrenous cholecystitis (3.25%), empyema gallbladder (1.5%), mucocele (0.75%), xanthogranulomatous cholecystitis (0.50%) and adenocarcinoma gallbladder (1%).

Conclusion: Cholecystectomy performed for a common condition like gallstone disease can result in a diverse and wide spectrum of histopathological lesions ranging from benign diagnosis to an unexpected gallbladder malignancy.

Keywords: Gallbladder, Cholecystitis, Cholelithiasis, Adenocarcinoma.

Introduction

Cholecystectomy specimens are among the most frequently accessioned specimens in general histopathology departments and account for a significant portion of the workload.[1] Histopathological examination of these specimens is primarily intended to rule out significant pathology, such as gallbladder dysplasia or carcinoma, the incidence of which varies greatly worldwide.[1]

Laparoscopic cholecystectomy is the treatment of choice done routinely for gallstone disease. Gallbladder is one of the most frequently received specimens in any histopathology laboratory. Usually, the diagnosis given in most of the cholecystectomy specimens is quite straight forward; that is, chronic cholecystitis. However, other diverse, but benign histopathological changes of gallbladder mucosa are also seen namely acute inflammation, cholesterosis, metaplasia and hyperplasia. Cholecystectomy performed with provisional diagnosis of benign diseases based on clinical, ultrasonological and computerized tomographic scanning misses a significant number of early malignant lesions of gallbladder. To avoid such blunders with bad consequences, therefore, every cholecystectomy specimen should be routinely examined histologically.[2]

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The purpose of this study was to determine the histopathological pattern of gallbladder lesions in cholecystectomy specimens in a South Delhi hospital and thus contribute in understanding of its etiopathogenesis.

Methods

Study Design: This was a retrospective study.

Study Type: This was an observational study.

Study Period: This study was conducted from 2017 to 2022

Study Place: This study conducted at Department of Pathology, Jahurul Islam Medical College, Bajitpur, Kishoregonj.

Study Population: The study was conducted on the resected cholecystectomy specimens which was operated in the Department of Surgery during a period of six years.

Sample Size: A total of 1200 cases were included in the study.

Sampling Method: Purposive.

Sampling Technique: Clinical details were retrieved from hospital records and histopathological data were obtained from the original pathology reports. Cholecystectomy specimens received in the laboratory were fixed in 10% formalin and submitted for gross examination after proper fixation. Three full thickness sections were obtained from fundus, body and neck of the gall bladder. Additional sections were taken from any grossly abnormal area if present. Sections were then stained with H and E stain and examined microscopically for a variety of morphological changes in the diseased gall bladder.

Data Analysis: All the necessary and relevant data were processed and analyzed by using the Microsoft Excel software.

Results

Table-I

Age and Sex distribution in different age groups (n=1200)

Age group (years)	Male (%)	Female (%)	Total (100%)
11-20	30 (5.81%)	15 (2.19%)	45 (3.75)
21-30	66 (2.79%)	117 (17.11%)	183 (15.25)
31-40	57 (11.05%)	150 (21.93%)	207 (17.25)
41-50	165 (31.97%)	174 (25.44%)	339 (28.25)
51-60	105 (5.81%)	105 (5.81%)	210 (17.5)
61-70	57 (5.81%)	72 (5.81%)	129 (10.75)
71-80	24 (5.81%)	48 (5.81%)	72 (6)
81-90	12 (5.81%)	03 (5.81%)	15 (1.25)

Twelve hundreds specimens of gallbladder received over a period of six years in our institution were analyzed histopathologically. Out of 1200 cases, there were 516 (43%) male and 684 (57%) female with M: F ratio of 1: 1.33. Mean age for male was 47.47 ± 15.65 yrs and for female was 45.87 ± 15.34 yrs. We found that a majority of patients of both sexes were in the age range of 41-50 yrs, with men (31.97%) predominating over women (25.44%) in that age group. The age and sex distribution are shown in Table –I.

Table-II

Presenting symptoms (n=1200)

Clinical presentation/ Symptoms	No. of Patients	Percentage (%)
Pain in the upper abdomen	1097	91.4%
Discomfort and fullness in the whole abdomen	556	46.3%
Dyspepsia, nausea, vomiting with food intake	434	36.2%
Intolerance to fatty food	140	11.7%
Feeling of mass in the right hypochondrium	109	9.1%
Non specific Incidental diagnosis	105	8.8%
Jaundice	88	7.3%

Large number of patients (85.2%) had gallstones according to the retrieved clinical data. Abdominal pain (91.4%) was the most common presenting symptom followed by abdominal discomfort (46.3%) and dyspepsia (36.2%). Table-II show clinical presentation of the patients. 88 (7.3%) patient presented with clinical jaundice. Most common clinical diagnosis was chronic cholecystitis in 972 patients (81%). 216 (18%) patients were operated for acute cholecystitis.

Table-III

Histopathological diagnosis

Clinical presentation	No. of patients with percentage
Chronic cholecystitis	801 (66.8%)
Acute on chronic cholecystitis	315 (26.25%)
Gangrenous cholecystitis	42 (3.5%)
Empyema gallbladder	15 (1.25%)
Mucocoele	9 (0.75%)
Xanthogranulomatous cholecystitis	6 (0.5%)
Adenocarcinoma	12 (1%)

All cases were examined microscopically and categorized according to their predominant microscopic pattern (Table-III). Chronic cholecystitis alone was the most common pathology reported in 801 (66.8%) cases followed by acute on chronic cholecystitis in 26.3% cases. Twelve cases of malignant lesions were found in the specimens. All were diagnosed as adenocarcinoma of the gallbladder. Eight cases of malignancy were diagnosed incidentally during microscopic examination. Table-III show histopathological diagnosis of the cases.

Table-IV

Microscopic features observed in non-neoplastic gallbladder specimen

Microscopic features	No. of cases	Percentage
Normal epithelium	112	9.3%
Ulceration / denudation of mucosa	396	33%
Perimuscular fibrosis	1128	94%
Lymphocytic infiltration	778	64.9%
Vascular congestion	510	42.5%
Rokitansky - Aschoff sinus	165	13.8%
Hypertrophic nerve bundle	212	17.7%
Metaplasia (intestinal + antral type)	86	7.2%

The non-neoplastic gall bladder microscopically was characterized by varying degrees of lymphohistiocytic infiltration along with per muscular fibrosis of the gallbladder wall, presence of Rokitansky-Aschoff sinuses, vascular congestion, metaplasia and hypertrophic nerve bundle (Table-IV).

Discussion

Gallbladder disease is one of the most common surgical disorder encountered by the surgeons which requires cholecystectomy. In our institution, all gallbladder samples collected after cholecystectomy are sent for histopathological examination. The main reason of routine pathological examination of cholecystectomy specimens is the exclusion of malignancy from the gallbladder as early diagnosis of gallbladder carcinoma is rarely achieved due to lack of specific signs and symptoms.[3]

In our study of 1200 cases, M: F ratio of 1:1.33 which was higher than other studies ranging from 1:2.6 to 1:6.4.[4, 5] Specimens with chronic cholecystitis are associated with cholelithiasis in about 95% of cases. Gallstones were seen in 85.2% cases, predominantly in women. This is consistent with the study by Mohan el al[6], who described predominance of gallstones in women. Majority of the patients was in the age group of 41-50 years. The incidence increases with age and in females possibly due to female sex hormones, sedentary habits and progressive increase in the secretion of biliary cholesterol.[7] Over ninety one per cent patients presented with pain upper abdomen, a number significantly lower than that reported by Laghari et al.[8] where all patients had upper abdominal pain.

The most common histopathological finding in our study was chronic cholecystitis; 801 (66.%) specimens were reported as chronic inflammation with filtration by chronic inflammatory and varying degrees of fibrosis. A similar study by Memon[9] also reports chronic cholecystitis as major histopathological finding, identified in 64.8% cases. Acute on chronic cholecystitis was found in 26.3% cases histologically characterized by congestion, edema, hemorrhage, acute inflammatory infiltrate and fibroblastic proliferation. Glenn et al[10] reported 6.17% acute cholecystitis cases in his study occurring more frequently in males. Xantho-granulomatous cholecystitis is a variant of chronic cholecystitis has been reported in 1.8% to 8.9% of cholecystectomy specimens .[11]

In our study, six cases were diagnosed as xantho-granulomatous cholecystitis. Empyema gallbladder is an unusual condition characterized by purulent infection of the gallbladder. The lumen is often distended with pus. Several reviews have identified empyema of the gallbladder in 2% to 11 % of patients undergoing

cholecystectomy.[11] We had 15 cases (1.25%) in this study.

Chronic inflammation to some degree is seen in most cases of chronic cholecystitis. Lymphocytic infiltration in varying degree is seen in 64.9% of the cases. However, perimuscular fibrosis of the gallbladder wall was the most consistent finding seen in 94% of cases. Rokitansky-Aschoff sinuses were seen in 13.8% of cases. Hypertrophic nerve bundles were seen in 17.7% cases. Hypertrophic nerve bundles probably occur secondary to obstruction.[4] Metaplastic changes were seen in 86 (7.2%) cases. Metaplasia of antral and intestinal type is frequently seen in gallbladders containing stones. It was presumed that prolonged irritation by gallstones and / or chronic inflammation led to metaplastic changes of gallbladder mucosa which may occasionally and eventually lead to the development of carcinoma. Khanna et al[12] reported 16% cases having metaplastic changes in their study.

Gallbladder carcinoma is a rare but fatal disease characterized by poor prognosis.[13] carcinoma constitutes 2- 4 % of all malignant lesions[14] and is the commonest malignancy of the biliary tract. Gallstones appear to be the most important risk factor, being reported in 70- 98% cases of gallbladder cancer, a far higher prevalence than that in age matched general population. Despite the strong association between carcinoma and presence of gallstone, the casual relationship between gallstone disease and carcinoma has not been established. Only 1- 3% of patients with gallstones go on to develop carcinoma and many patients without gallstones develop carcinoma.[13] In our study there were 12 cases of adenocarcinoma, all of which were associated with gallstone.

Conclusion

The histopathological spectrum of gallbladder after cholecystectomy is extremely variable. . Incidental diagnosis of carcinoma gallbladder is not rare; we discovered evidence of malignancy in 12 (1.0%) cases on subsequent histopathological examination of gallbladder specimen. The utility of submitting all routine cholecystectomy specimens for histopathological examination should be critically appreciated.

Conflict of interest: None

References:

1. Hayes B.D., Muldoon C. Seek and ye shall find: the importance of careful macroscopic examination and thorough sampling in 2522 cholecystectomy specimens. Annals of Diagnostic Pathology, 2014, 18 (3): 181-6.
2. Samad A: Gall bladder carcinoma in patients undergoing cholecystectomy for cholelithiasis. J Pak Med Assoc 2005, 55:497–499.
3. Overby W., Apelgren K., Richardson W., Fanelli R. SAGES guidelines for the clinical application of laparoscopic biliary tract surgery. Surg. Endosc., 2010, 24 (10): 2368-86
4. Lack EE. Cholecystitis, cholelithiasis and usual infection of the gallbladder In: Pathology of Pancreas, Gallbladder, Extrahepatic biliary tract and Ampullary region. New York: Oxford university press. 2003. pp414-52.
5. Baig SJ, Biswas S, Das S, Basu K, Chattopadhyay G. Histopathological changes in gallbladder mucosa in cholelithiasis: correlation with chemical composition of gallstones. Trop Gastroenterol 2002; 23:25- 7.
6. Mohan H, Punia RPS, Dhawan SB, Ahal S, Sekhon MS. Morphological spectrum of gallstone disease in 1100 cholecystectomies in North India. Indian J Surg 2005;67:140-2.
7. Baig SJ, Biswas S, Das S, Basu K, Chattopadhyay G. Histopathological changes in gallbladder mucosa in cholelithiasis: Correlation with chemical composition of gallstones. Trop Gastroenterol 2002;23:25-7.
8. Laghari AA, Talpur KAH, Malik AM, Khan SA, Memon AI: Laparoscopic Cholecystectomy in complicated gallstone disease. J Liaquat Uni Med Health Sci 2008, 7(1):18–24.
9. Memon W, Khanzada TW, Samad A, Kumar B: Histopathology sepectrum of gallbladder specimens after cholecystectomy. Pak J Med Sci 2011, 27(3):533–536
10. Glenn F. Acute acalculous cholecystitis. Ann Surg 1979;189:458-64. PMid:443901
11. Lack EE. Cholecystitis, cholelithiasis and usual infection of the gallbladder In: Pathology of Pancreas, Gallbladder, Extrahepatic biliary tract and Ampullary region. New York: Oxford university press. 2003. pp414-52.
12. Khanna R, Chansuria R, Kumar M, Shukla MS. Histological changes in gallbladder due to stone disease. Indian J Surg 2006;68 201–4.
13. Barakat J, Dunkelberg J, Ma T. Changing patterns of gallbladder carcinoma in New Maxico. Cancer 2006;106:434-40.
14. Gupta SC, Mishra V, Singh PA, Roy A, Mishra SP, Gupta AK. Significance of cytomorphological and microbiological examination of bile collected by