# Histological and Histopathological study of Cholecystectomy Specimens

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**Abstract:**

Introduction: Cholecystectomy specimen (gallbladder) is the frequently encountered surgical specimen in a histology laboratory. It shows different histopathological changes ranging from inflammation to pre malignant changes to carcinoma. Incidental detection of gallbladder cancer in cholecystectomy specimen has been reported in 0.3 to 2% of all cholecystectomies performed for benign condition. **Aims:** To study the different histopathological entities of the cholecystectomy specimens and to find out the frequency of gallbladder cancer in these specimens, determine the gender and age wise distribution of the patients, find out the association of gallstones with different gall bladder lesions, and obtain clinic-pathological correlation of various gall bladder lesions. **Material & Methods:** The histopathological study was carried out on 100 cholecystectomy specimens received in the Department of Pathology, Dhiraj Hospital, Waghodia, during the study period of two years. **Results:** Age of patients in the study group ranged from 8-81 years with mean age of 44.5 years. Out of total 100 cases, 22 (22%) were male and 78 (78%) were female patients with male : female ratio being 1:3.5. Out of 100 cases studied, only 4 were proved to be neoplastic; with all being adenocarcinoma. **Conclusion:** In the present study, 100 cases of cholecystectomy specimens were studied for histopathological evaluation showing various gallbladder lesions like chronic

cholecystitis, acute cholecystitis, cholelithiasis, xanthogranulomatous cholecystitis, adenomyomatosis, metaplasia and carcinoma.

**Keywords:** Cholecystectomy,cholecystitis,,adenocarcinoma

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**Introduction:**

The gall bladder is one of the most frequently surgically resected organs and present with a varied spectrum of diseases ranging from congenital anomalies, cholelithiasis, inflammatory, and non-inflammatory diseases to non-invasive and invasive neoplastic diseases. Cholelithiasis is a common disorder affecting 10-20% of adult populations in developed countries.[1] It can manifest clinically and histologically as a myriad of disorders encompassing acute cholecystitis, chronic cholecystitis (CC), metplasia, hydrops, mucocele, empyema, and gallstone ileus. The risk factors for the development of gallstone disease can be categorized as non modifiable and modifiable. Non modifiable factors include ethnic background, increasing age, female gender and family history or genetics whereas; the modifiable ones are obesity, rapid weight loss, and sedentary lifestyle.[2] Several studies have shown a definite epidemiologic parallel between gall bladder carcinoma and cholelithiasis.[3,4,5] There has been a recent upsurge in studies focusing on the need of routine or selective histopathology of electively resected gall bladder.

Gall bladder disease poses to be a common health issue worldwide, which requires cholecystectomy. Earlier, western countries were more prone to the gallbladder pathologies, but nowadays its on a rise in Asia probably because of the increase in calorie and fat intake, decrease in fibre in their diet together with a sedentary lifestyle.[6] Cholecystectomy is the most common major abdominal procedure performed worldwide. It is well known that gall bladder diseases maladies influence generally middle aged women. A gallstone is calculus or stone formed within the gallbladder as a concretion of bile components.[7] Risk factors for gallstone formation include female sex, increasing age, pregnancy, OCPs, obesity, diabetes mellitus, ethnicity and rapid weight loss.[8] Laparoscopic cholecystectomy currently consideres the gold standard management for symptomatic cholelithiasis.[9,10]

Chronic cholecystitis happens after repeated episodes of intense cholecystitis and is nearly continuously due to gallstones.[11] Although symptomatic cholelithiasis is considered a benign disease entity, gallstones are a known risk factor for gallbladder malignancy (GBM) and stones may coexist with GBM.[12]

Carcinoma of the bladder is the 5th most common cancer of the digestive tract and the most common malignancy of the biliary tract. 10 The clinical manifestations of gall bladder carcinoma are generally indistinguishable from those associated with cholecystitis or cholelithiasis. Around 90% of GB carcinomas have accompanying stones. Stones and chronic inflammation are the risk factors for carcinoma of the gall bladder.

Most of the cases of GB carcinoma are diagnosed incidentally during or after surgery performed for stones or benign biliary diseases. Despite advancements in various diagnostic procedures, preoperative diagnosis of early GB carcinoma is very difficult to diagnose. Advanced stage of the disease because of delayed diagnosis leads to its poor prognosis.

**Methods and materials:**

The histopathological study was carried out on 100 cholecystectomy specimens received in the Department of Pathology, Dhiraj Hospital, Waghodia, during the study period of two years; from Feb 2018

Method:

All cholecystectomy specimens received in the Pathology department of our institute were examined grossly for presence of pus, fibrin, hemorrhage, hyperemia, perforation and presence of any localized lesion. Measurement of each specimen and any pathological lesion was noted. When gallstones were present, they were described in detail. The specimens were fixed in 10% buffered formalin overnight. After fixation, representative sections were taken from the fundus, neck and body of the gallbladder as per the standard criteria. Additional sections were taken from any abnormal gross lesion noted in the specimen. Sections were processed by a routine paraffin embedding technique and 5 micron thick tissue sections were cut by microtome. The tissue sections were stained with Hematoxylin and Eosin (H&E) stain. The sections were mounted in DPX. Microscopic examination was done and a histopathological diagnosis was rendered. The patient's data regarding clinical profile were collected from the Surgery Department of the institute. Data were statistically analyzed.

Inclusion criteria:

All cholecystectomy specimens received in the Pathology department of Dhiraj hospital, Waghodia.

Exclusion criteria:

- Autolyzed specimens
- Cases without clinical details.

**RESULT:**

The study included 100 cholecystectomy specimens sent for histopathological evaluation at Dhiraj hospital

TABLE 1: AGE AND SEX DISTRIBUTION OF PATIENTS WITH CHOLECYSTECTOMY SPECIMENS.

| Age (Years) | Males | Females | Total |
|---|---|---|---|
| 0-10 | 0 | 0 | 0 |
| 11-20 | 1 | 3 | 4 |
| 21-30 | 04 | 10 | 14 |
| 31-40 | 08 | 21 | 29 |
| 41-50 | 05 | 20 | 25 |
| 51-60 | 02 | 11 | 13 |
| 61-70 | 02 | 09 | 11 |
| 71-80 | 00 | 03 | 03 |
| 81-90 | 00 | 01 | 01 |
| Total | 22 | 78 | 100 |

Age of patients in the study group ranged from 8-81 years with mean age of 44.5 years. Maximum no. of patients were noted in fourth decade i.e. between 31-40 years of age (29%). Out of total 100 cases, 22 (22%) were male and 78 (78%) were female patients with male : female ratio being 1:3.5

TABLE 2 : PRESENTING SYMPTOMS

| Symptoms | No. of patients (n=100) | Percentage |
|---|---|---|
| Pain in epigastrium | 92 | 92 |
| Anorexia | 56 | 56 |
| Intolerance to fatty food | 45 | 45 |
| Nausea and/or vomiting | 26 | 26 |

| | | |
|---|---|---|
| Mass in right hypochondrium | 01 | 01 |

Patients having gallbladder lesions presented with clinical features of pain in epigastrium, anorexia, intolerance to fatty food, nausea and vomiting, one patient of carcinoma had additional finding of mas in right hypochondrium. Pain in epigastrium was the major complaint found in 92 (92%) patients out of total 100 cases.

TABLE 3 : HISTOPATHOLOGICAL SPECTRUM OF GALLBLADDER LESIONS

| Histopathological diagnosis | | Number and percentage |
|---|---|---|
| Non-neoplastic (n=96) (94.0%) | Chronic cholecystitis with cholelithiasis | 54(54%) |
| | Acute on chronic cholecystitis with cholelithiasis | 16(16%) |
| | Chronic cholecystitis | 15(15%) |
| | Acute on chronic cholecystitis | 04(04%) |
| | Acute cholecystitis | 2(02%) |
| | Chronic cholecystitis with adenomyomatous hyperplasia | 1(01%) |
| | Empyema | 2(02%) |
| | Xanthogranulomatous cholecystitis | 1(01%) |
| | Chronic cholecystitis with reactive lymphadenitis | 1(01%) |
| Neoplastic (n=4) 4.0% | Benign | 0 (0.00%) |
| | Malignancy (Adenocarcinoma) | 4 (04%) |

Amongst the non-neoplastic category, inflammatory lesions were predominant. Chronic cholecystitis associated with cholelithiasis was the most common. Out of 100 cases studied, only 4 were proved to be neoplastic; with all being adenocarcinomas.

The association of cholelithiasis was seen in 70 cases (70.0%) of total gallbladder lesions studied. Highest association was seen in chronic cholecystitis (69.0%) .

DISCUSSION:

The gallbladder is one of the organs having a wide spectrum of infections extending from congenital anomalies, calculi, non-inflammatory and inflammatory lesions to the neoplastic lesions. The present study was carried out on 100 cholecystectomy specimens to determine the histological & the histopathological spectrum of lesion in resected specimens of gall bladders.

TABLE 4 : MALE:FEMALE RATIO OF GALLBLADDER LESI ONS IN DIFFERENT STUDIES

| Studies | Male:Female ratio |
|---|---|
| N.T.Damor et al[13] | 1:2.3 |
| Tadashi Terada et al[14] | 1:1.5 |
| Dr. Gudeli Vahini et al[15] | 1:1.5 |
| Tantia et al[16] | 1:2.8 |
| Asuquo et al[17] | 1:5 |
| Present study | 1:3.5 |

In the present study, gallbladder lesions were more common in females than in males with a Male : Female ratio of 1:3.5. This was consistent with the other following studies (Table 4)

TABLE 5: AGE GROUP WISE PEAK INCIDENCE OF GALL BLADDER LESIONS OBSERVED IN DIFFERENT STUDIES.

| Studies | Age group (in years) |
|---|---|
| Mohan et al[18] | 31-40 |
| Khan S et al[19] | 31-40 |
| Mittal et al[20] | 41-50 |
| Bawahab et al[21] | 41-50 |
| Present study | 31-40 |

Gall stones are precipitating factors for most of the gallbladder diseases. In female patients, the frequency of gall stones is more because of a sedentary lifestyle, sex hormone estrogen and genetic factors.[18] In the present study, the age of the patients ranged from 8-81 years with peak frequency observed in the fourth decade. Comparative analysis pertaining to age distribution is shown in Table 5.

TABLE 6: RATIO OF NON-NEOPLASTIC: NEOPLASTIC LESIONS OF GALLBLADDER IN DIFFERENT STUDIES

| Studies | Non-neoplastic: Neoplastic lesions |
|---|---|
| Khanna Rahul et al[22] | 16:1 |
| Ojed et al[23] | 24:1 |
| N.T.Damor et al[13] | 19:1 |
| Dr Ashok Yadav et al[24] | 20:1 |
| Present study | 25:1 |

The present study showed 96 (96.0%) non-neoplastic lesions and 4 (4.0 %) neoplastic lesions microscopically. The non-neoplastic to neoplastic lesions' ratio was 25:1. In all of the following studies, preponderance of non-neoplastic lesions were observed in Table 6.

TABLE 7: HISTOPATHOLOGICAL SPECTRUM OF GALLBLADDER DISEASES IN VARIOUS STUDIES

| Studies | Acute cholecystitis | Chronic cholecystitis | Xanthogranulomatous cholecystitis | Adenomyomatous hyperplasia | Metaplasia | Carcinoma |
|---|---|---|---|---|---|---|
| Vijaya et al[25] | 23 | 207 | 2 | 3 | - | 4 |
| Nidhi Awasthi[26] | 6 | 584 | 13 | - | 2 | - |
| Terada T et al[27] | 8 | 518 | 5 | - | - | 13 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Dharmakant et al[28] | 5 | 345 | 2 | 5 | 2 | 5 |
| Present study | 22 | 69 | 01 | 01 | 00 | 04 |

In all these studies, chronic cholecystitis was the commonest lesion.

Adenomyomatous hyperplasia was seen in 01 cases. It is a mural collection of cystically dilated glands forming a solitary mass or a band of trabeculated thickening of the gallbladder wall. Rarely, in situ or invasive adenocarcinoma may arise from the focus of adenomyomatous hyperplasia. So careful microscopic examination is needed for correct diagnosis.

In our study, xanthogranulomatous cholecystitis was seen in 01 patients. It is an inflammatory disease which can mimic gallbladder carcinoma grossly due to marked wall thickening.

Luschka ducts were found in a few cases of acute and chronic cholecystitis. There are remnants of embryonic primordium of the liver, maybe seen in the perimuscular connective tissue, especially adjacent to the liver. They can become atypical with injury and mimic adenocarcinoma gallbladder.

We found 04 (4.0%) cases to be neoplastic lesions. All these 4 cases were adenocarcinoma.

**CONCLUSION:**

In the present study, 100 cases of cholecystectomy specimens were studied for histopathological evaluation showing various gallbladder lesions like chronic cholecystitis, acute cholecystitis, cholelithiasis, xanthogranulomatous cholecystitis, adenomyomatosis, metaplasia and carcinoma.

The main strength of this study is that it gives the most comprehensive picture of the different histopathological pattern and the frequency of incidental diagnosis of gall bladder cancer of cholecystectomy specimens done at the institute. The major limitations of this study include the small sample size and short study period.

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