

Histopathological Findings in Patients Surgically Treated for Gallbladder Disease

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Abstract

Introduction: Histopathological examination of the gallbladder is crucial in understanding the specific type of gallbladder disease present in a patient. It is used to differentiate between chronic and acute cholecystitis, adenomyomatosis, neoplasia, and other forms of gallbladder disease. This examination can aid in the development of an appropriate treatment plan and can help predict the outcomes of the patient. It also helps to understand the progression of the disease and the risk of complications that the patient may face.

Aim of the study: The study aimed to observe the histopathological gradings and findings of gallbladder problems among patients who had undergone surgery.

Methods: This prospective cross-sectional and observational study was carried out in the Department of General Surgery and Hepato-Biliary-Pancreatic surgery, BIRDEM General Hospital, Dhaka from August 2019 to February 2021. Patients admitted to the General Surgery and Hepato-Biliary-Pancreatic Surgery Department of BIRDEM hospital who underwent gallbladder surgery were recruited for this study. Consecutive sampling was done in this study.

Result: The present study findings showed that the majority (65.45%) of the participants were between the age of 50-59 years, with 38.18% being male and 61.82% being female. The most common comorbidities were diabetes (62.73%), hypertension (43.64%) and anaemia (40%). The most common clinical presentation was abdominal pain (76.36%) and the most common histopathological diagnosis was chronic calculous cholecystitis (49.09%), while 20% of participants had gallbladder carcinoma. Among the 22 participants who had gallbladder carcinoma, the majority were adenocarcinoma with good differentiation and superficial invasion.

Conclusion: The study shows that gallbladder disease can have a variety of histopathological diagnoses, with chronic calculous cholecystitis being the most common. Adenocarcinoma was found to be the most frequent type of gallbladder cancer. The study also found that the cancer was mostly well differentiated and superficial invasion. The findings of this study provide important information on the histopathological changes associated with gallbladder disease, but it's important to consider that it is based on a small sample size, and further research is needed to confirm the results.

Keywords: Gallbladder, Histopathological, Cholelithiasis, Gallstones

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I. INTRODUCTION

Gallbladder disease is a common condition that affects millions of people worldwide. The most common form of gallbladder disease is cholelithiasis or the presence of gallstones. (1,2) Gallstones are formed when bile, a fluid produced by the liver, becomes saturated with cholesterol or bilirubin. These solidified crystals can then accumulate in the gallbladder, leading to inflammation and pain. (3–5) In some cases, gallstones can cause serious complications such as infection, inflammation of the pancreas, or even cancer. (6,7) Globally, the prevalence of gallbladder disease varies depending on the region and population. In the United States, it is estimated that 10-15% of the population will develop gallstones in their lifetime. (8,9) In contrast, the prevalence of gallbladder disease in Asia is generally lower, with estimates ranging from 2-5%. (10) However, there is a higher incidence of gallbladder cancer in certain Asian populations, such as in India, which is believed to be related to a high prevalence of gallstones and chronic inflammation of the gallbladder. (10) The cause of gallbladder disease is not fully understood, but risk factors include obesity, diabetes, and a high-fat diet. Additionally, certain medications, such as birth control pills, can increase the risk of developing gallstones. (11) The resulting problems and ailments from gallbladder disease can include abdominal pain, nausea, vomiting, and jaundice. In some cases, gallstones can cause serious complications such as infection, inflammation of the pancreas, or even cancer. (1) Morbidity and mortality rates associated with gallbladder disease are relatively low, but they are higher in certain populations such as the elderly, and those with other underlying health conditions. (12,13) The most common treatment for gallbladder disease is cholecystectomy or surgical removal of the gallbladder. In most cases, this procedure is successful in relieving symptoms and preventing complications. (13) However, in some cases, patients may develop post-cholecystectomy syndrome, which can include symptoms such as abdominal pain, nausea, and diarrhoea. Histopathological examination of the gallbladder is crucial in identifying the specific type of gallbladder disease present in a patient. The most common histopathological types of gallbladder disease include cholecystitis, adenomyomatosis, and neoplasia. (14,15) Neoplasia, or cancer, of the gallbladder is a rare but aggressive disease with a poor prognosis. Histopathological examination is crucial in identifying the specific type of neoplasia present, as this can have important implications for patient management and prognosis. (16) In conclusion, histopathological examination of the gallbladder is essential in identifying the specific type of gallbladder disease present in a patient. Identifying the type of disease can aid in the development of an appropriate treatment plan and can help in predicting the outcomes of the patient. It also helps to understand the progression of the disease and the risk of complications that the patient may face. The present study aimed to observe the histopathological findings among patients who had been surgically treated for some form of gallbladder disease.

II. OBJECTIVES

To observe the histopathological grading and findings of gallbladder problems among patients who had undergone surgery.

III. METHODS

This study was a prospective, cross-sectional and observational study conducted in the Department of General Surgery and Hepato-Biliary-Pancreatic Surgery at BIRDEM General Hospital in Dhaka, Bangladesh. It ran from August 2019 to February 2021. Patients who had undergone gallbladder surgery at the hospital were recruited for the study using consecutive sampling. Due to the COVID pandemic and limited resources, a total of 110 patients were included in the study. Participants were selected based on specific inclusion and exclusion criteria, and data was collected through a structured questionnaire and digital Vernier slide callipers, after obtaining informed written consent. The study was conducted in Bengali and the questionnaire was pre-tested on similar patients. The study collected detailed patient information, including symptoms of biliary colic, previous attacks of colic, jaundice, and pancreatitis, as well as comorbid conditions and previous symptoms. Physical examination, abdominal examination, routine investigations, and biochemical markers were also collected. The thickness of the gallbladder wall was identified through specific investigation using USG of the abdomen, and findings were recorded. Additionally, the findings of imaging studies such as CECT abdomen, MRI, and MRCP were noted when performed. All information was recorded in separate case record forms.

Inclusion criteria:

- Patients who would undergo surgery for gallbladder disease and suggestive of having gallbladder wall >3mm wall (confirmed by pre-operative Ultrasonography)
- Adult patients irrespective of age, sex, comorbidity
- The patient who gave consent

Exclusion criteria:

- The patients who were not available to communicate through their residential permanent addresses mentioned in the hospital records
- Refusal of patient or the attending surgeon at any stage
- Gallbladder wall thickness <3mm
- Patients who had gall bladder mass
- Patients who were not undergoing surgery

Data processing and analysis

Statistical analysis was performed using SPSS version 26 software. Categorical variables were presented as frequencies and percentages, while continuous variables were presented as means and standard deviations. The association between categorical variables was analyzed using the chi-square test, and the difference between continuous variables was analyzed using the student t-test.

IV. RESULTS

Table 1: Distribution of participants by basic characteristics (N=110)

Variables	N	%
Age		
40-49	12	10.91%
50-59	72	65.45%
≥60	26	23.64%
Gender		
Male	42	38.18%
Female	68	61.82%
Gall Bladder Wall Thickness		
Mild (4-7 mm)	41	37.27%
Moderate (8-10 mm)	58	52.73%
Severe (>10 mm)	11	10.00%
Type of Surgery		
Laparoscopic	95	86.36%
Open Normal	9	8.18%
Open Radical en bloc	6	5.45%

The majority of participants in this study were between the ages of 50-59 years, representing 65.45% of the total population. Additionally, 23.64% of participants were 60 years or older, while 10.9% were between the ages of 40-49 years. The study also observed a higher prevalence of female participants, with 61.82% being female and 38.18% being male. The gallbladder wall thickness of the majority of participants (52.73%) was moderate, with 10% having a severe wall thickness of over 10 mm. The most common method of management for gallbladder disease in this study was laparoscopic surgery, with 86.36% of participants undergoing this procedure. 8.18% of participants underwent normal open surgery, and 5.45% had open radical en bloc surgery [Table 1].

Table 2: Associated co-morbidity and personal history of study patients (N=110)

Comorbidities	N	%
Diabetes	69	62.73%
Hypertension	48	43.64%
Anemia	44	40.00%
Overweight	40	36.36%
Ischemic Heart Disease	11	10.00%
Bronchial Asthma	9	8.18%
Hypothyroidism	3	2.73%

H/O smoking	16	14.55%
H/O alcohol consumption	2	1.82%

Many of the participants in this study had multiple comorbidities. The most prevalent comorbidity was diabetes, which was observed in 62.73% of participants. Hypertension was also a common comorbidity, present in 43.64% of participants. Other comorbidities included anaemia (40%), ischemic heart disease (10%), bronchial asthma (8.18%), and being overweight (36.36%). Additionally, 14.55% of participants had a history of smoking, and 1.82% had a history of alcohol consumption. These comorbidities can have a significant impact on the management and prognosis of gallbladder disease and should be taken into consideration during patient care [Table 2].

Table 3: Clinical presentations among study patients(N=110)

Clinical presentation	N	%
Abdominal pain	84	76.36%
Anorexia	61	55.45%
Nausea	65	59.09%
Weight loss	31	28.18%
Jaundice	38	34.55%
Asymptomatic	9	8.18%

A variety of clinical presentations were seen among the individual participants in this study. Abdominal pain, a common symptom of gallbladder disease, was observed in 76.36% of cases. Additionally, 55.45% of participants reported anorexia, 59.09% reported nausea, 34.55% had jaundice, 28.18% experienced weight loss, and 8.18% were asymptomatic. These varied presentations highlight the importance of thorough clinical examination and investigation to correctly diagnose and treat gallbladder disease, as some patients may not present with the typical symptoms [Table 3].

Table 4: Histopathological diagnosis of study patients (N=110)

Histopathological diagnosis	N	%
Gall bladder carcinoma	22	20.00%
Chronic calculous cholecystitis	54	49.09%
Chronic acalculous cholecystitis	8	7.27%
Gall bladder cholesterics	7	6.36%
Gall bladder polyp	7	6.36%
Empyema gall bladder	4	3.64%
Acute cholecystitis	3	2.73%
Gall bladder mucocele	3	2.73%
Gall bladder adenomyoma	1	0.91%
Granulomatous inflammation	1	0.91%

The study found that the most common diagnosis was chronic calculous cholecystitis, which accounted for 49.09% of the cases. Gallbladder carcinoma, a rare but aggressive form of cancer, was diagnosed in 20.00% of cases. Chronic acalculous cholecystitis, gall bladder cholesterics, and gall bladder polyp were each diagnosed in 7.27%, 6.36%, and 6.36% of cases, respectively. Other less common diagnoses included empyema gall bladder (3.64%), acute cholecystitis (2.73%), gall bladder mucocele (2.73%), gall bladder adenomyoma (0.91%), and granulomatous inflammation (0.91%). These findings indicate that a diverse range of histopathological diagnoses can be observed in patients with gallbladder disease, and highlight the importance of thorough histopathological examination for accurate diagnosis and treatment [Table 4].

Table 5: Histopathological feature of gall bladder carcinoma patients (n=22)

Histopathological diagnosis	n	%
Adeno carcinoma	21	95.5
Adeno-squamous carcinoma	1	4.5
Differentiation Grade		
Well differentiated	13	59.09
Moderately differentiated	4	18.2
Poorly differentiated	4	18.2
Invasion		
pT1	13	59.1
pT2	05	22.7
pT3	04	18.2

Among the 22 patients diagnosed with gallbladder carcinoma, 95.5% had been adenocarcinoma cases, and 4.5% were adeno-squamous cell carcinoma cases. It was found that the most common differentiation grade was well differentiated, which accounted for 59.09% of the cases. Moderately differentiated and poorly differentiated cancer cells were each diagnosed in 18.2% of the cases. Additionally, the study evaluated the invasion of the cancer, which is a measure of how deep into the gallbladder wall the cancer has grown. It was found that the most common invasion was pT1, which accounted for 59.1% of the cases. pT2 and pT3 were each diagnosed in 22.7% and 18.2% of the cases, respectively [Table 5].

V. DISCUSSION

The present study was conducted to observe the histopathological findings and gradings among a total of 110 patients with gall bladder diseases who had been surgically treated. The study found that the majority of participants (65.45%) were between the age of 50-59 years, with a higher female prevalence (61.82%). Previous studies have also found that most gall bladder carcinomas occur in the 6th decade of life more commonly in females. (17–20) Therefore, elderly females with gallbladder diseases should be evaluated extensively for early diagnosis and management of gallbladder carcinoma.

The most common comorbidity was diabetes (62.73%), followed by hypertension (43.64%) and anaemia (40%). This distribution of comorbidities was not uncommon, as many other studies have also observed similar comorbidities, and some had observed a higher incidence of ischemic diseases. (21–24) The most common clinical presentation was abdominal pain (76.36%), followed by anorexia (55.45%) and nausea (59.09%). A similar prevalence of clinical presentations was observed in other studies as well. (25)

The most common histopathological diagnosis was chronic calculous cholecystitis (49.09%), while 20% of participants had gallbladder carcinoma. In this study, 49.1% of patients were diagnosed with chronic calculous cholecystitis, followed by chronic acalculous cholecystitis (7.3%), gall bladder polyp (6.3%), gall bladder cholesterol (6.4%), empyema gall bladder (3.6%), gall bladder mucocele (2.7%), adenomyoma (.9%), chronic granulomatous inflammation (0.9%) in decreasing order.

Chronic calculous cholecystitis is a condition characterized by inflammation of the gallbladder, caused by the presence of gallstones. It is a type of chronic cholecystitis, which is a long-term inflammation of the gallbladder. It is characterized by a gradual onset of symptoms and less severe inflammation than acute cholecystitis. The main symptoms include abdominal pain, nausea, vomiting, and jaundice. The prevalence of chronic calculous cholecystitis among gallbladder diseases varies depending on the population and region, but a similar high prevalence was observed in other studies as well. (26,27)

Among the 22 patients diagnosed with gallbladder carcinoma, the study found that adenocarcinoma was the most common type of gallbladder cancer, accounting for 95.5% of the cases. Adenosquamous cell carcinoma was present in only 4.5% of the cases. In terms of differentiation grade, the majority of cases (59.09%) were well differentiated, with 18.2% being moderately differentiated and 18.2% being poorly differentiated.

The study also evaluated the depth of cancer invasion into the gallbladder wall, with the most common being pT1 (59.1%), followed by pT2 (22.7%) and pT3 (18.2%). These findings indicate that the majority of the gallbladder cancer cases in the sample were adenocarcinoma with good differentiation and superficial invasion,

which might suggest a better prognosis. However, it is important to note that the study is based on small sample size, and further research is needed to confirm these findings.

Limitations of The Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

VI. CONCLUSION

The study shows that gallbladder disease can have a variety of histopathological diagnoses, with chronic calculous cholecystitis being the most common. Adenocarcinoma was found to be the most frequent type of gallbladder cancer. The study also found that the cancer was mostly well differentiated and superficial invasion. The findings of this study provide important information on the histopathological changes associated with gallbladder disease, but it's important to consider that it is based on a small sample size, and further research is needed to confirm the results.

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