

Prevalence of Gallbladder Cancer in Cases Presented to Tertiary Care Hospital, Retrospective Five-Year Study on Cholecystectomy Specimen

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Abstract

Background: The gallbladder is surgically removed in a cholecystectomy. The prevalence of gallbladder carcinoma is determined by examining cholecystectomy specimens. Gallbladder carcinoma is an extremely unusual condition that affects more women than men. The goal of this study is to find out how common gallbladder cancer is in medical centers over five years.

Objective: To determine the frequency and prevalence of Gallbladder cancer (GBC) in tertiary care hospitals over five years

Methods: We analyzed the record of 1835 patients who underwent cholecystectomy at our tertiary care center, Mayo Hospital Lahore.

Results: Adenocarcinoma was found in only 7 cases (0.4%) out of 1835 cholecystectomy specimens. Gallbladder cancer is more common in females (6, 85.71%) than in males (1 case, 14.78%). Chronic cholecystitis accounted for the majority of the cases (1703, or 92.8%), followed by acute cholecystitis (66, or 3.6%), Xanthogranulomatous, cholecystitis (30, or 1.6%), gangrenous cholecystitis (6, or 0.34%), follicular cholecystitis (3, or 0.016%) and one case (0.05%) each of cholesterolosis, foci of chronic inflammation, hemorrhagic infarction and empyema gallbladder. 13 cases (0.79%) was partially or fully utilized.

Conclusion: Chronic cholecystitis is the most common disease in cholecystectomy specimens followed by acute cholecystitis, Xanthogranulomatous cholecystitis, gangrenous cholecystitis, follicular cholecystitis, and empyema gallbladder. Gallbladder carcinoma is very rare and more common in females than males.

Keywords: Gallbladder cancer, gallbladder stones, cholecystectomy, female gender, cholecystitis.

INTRODUCTION

Gallbladder diseases are a universal health issue [1]. Infectious, genetic, and malignant disorders can harm the gallbladder (GB) [2, 3]. These illnesses produce indications and symptoms that warrant cholecystectomy surgery, either open or laparoscopic. Pro-inflammatory gallbladder disorders are more common than other diseases, and they can manifest as different types of cholecystitis. [4, 5]. Gallbladder carcinomas are aggressive, with a 5-year survival rate of nearly 5% [6]. Gallbladder cancer is assumed to develop in the presence of long chronic inflammation, leading to the concept that it develops in a stepwise progression from metaplasia through dysplasia to carcinoma. [7].

Cholecystectomy is a common treatment for a variety of reasons, and with the development of laparoscopy, the procedure is becoming more common. As a result, there's a higher chance of gallbladder cancer being discovered by coincidence. Carcinoma of the gallbladder is a frequent cancer that ranks fifth among the most common cancers of the digestive tract [8].

Incidental gallbladder carcinoma (IGBC) is a malignancy found by chance after cholecystectomy or after a histological examination of a GB sample excised for mild GB disorder. The incidence of IGBC is 0.19 to 3.3% at Patna's pathology department [9].

In Western patients, intestinal metaplasia was 0.2% and reactive atypical was 0.5%. The majority of individuals with these premalignant illnesses are in their later years of life, suggesting that the probability of a malignant change increases with age [10, 11].

The exact cause is unknown, although there is a strong relationship between CC and gallbladder malignancy all over the world. Over 20 years, the chance of acquiring cancer among people with untreated cholelithiasis has been estimated to be 0.2-0.5% [12]. Gallbladder cancer has

been linked to a range of risk factors, including genetics, dietary variables, endo and exotics, chronic inflammation, and infection, among others [13]. Gallbladder cancer (GBC) was mostly moderately to poorly differentiated adenocarcinoma described by Barcia *et al.* [8].

The malignant alteration of cells is strongly linked to chronic inflammation. Chronic inflammation damages DNA, causing tissue proliferation and restoration to occur repeatedly. The release of cytokines and growth factors as a result of this reaction predisposes cells to neoplastic transformation [14]. If accidental gallbladder cancer is detected early, the prognosis is better, and a poor prognosis is present late [9].

The clinical and pathological stages of gallbladder cancer are the most important prognostic variables. Other critical characteristics that influence surgical options and predict success include the size of the tumor, its position in the gallbladder, the presence or absence of dysplastic mucosa, and the tumor's grade [12].

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Table 1: Gallbladder diseases: Benign vs. Malignant.

	Chronic Cholecystitis	Acute Cholecystitis	Gangrenous Cholecystitis	Follicular Cholecystitis	Adenocarcinoma	Xanthogranulomatous Inflammation
Frequency (%)	92.8	3.6	0.32	0.16	0.4	1.6
Cases (n)	1703	66	6	3	7	30

Although the prognosis of an incidental carcinoma (IC) is better than that of a preoperative suspected carcinoma, it is nevertheless poor: 5-year survival rates in the literature are 35 vs. 5%, with a median of 26.5 vs. 9.2 months in suspected cases [15]. The prevalence and patterns of presentation of all patients with gallbladder cancer (GBC) examined at our tertiary hospital over five years are highlighted in this study.

METHODS

This is a retrospective study which was conducted at the pathology department, King Edward Medical University, Lahore. The study was completed during six months from June to December 2021. The records of 1835 patients during past five years (2017-2021) were reviewed with a mean age of 41.07 years. The sample size of 1835 was calculated using a 95% confidence level, 2% absolute precision, and a 74.28% estimated percentage of gallbladder carcinoma [16].

$$n = \frac{Z_1^2 - \frac{a}{2} [P \cdot q]}{d^2}$$

Where,

$Z_1^2 - a/2 =$ Confidence level 95%=1.96

$P =$ Prevalence =74.28%

$q = 1 - P$

$d =$ absolute precision 2%

These patients were referred to surgical outdoors and after getting their histories, physical examination, and necessary investigations, informed consent was obtained before their cholecystectomy. The gallbladders were sent to the pathology laboratory and fixed in 10% formalin solution. After gross examination, sectioning was done and tissue was processed and embedded. Slides were prepared which were stained with hematoxylin and eosin stains. Data was analyzed using SPSS version 26.

RESULTS

1835 cholecystectomy specimens were examined over six months. The patients' ages ranged from 13 to 90. The average age at the time of presentation was 41.07±12.577. Females were impacted more frequently (1,501 cases, or 81.8%), while males were only affected in 334 cases (18.2%).

Adenocarcinoma is found in only 7 cases (0.4%) out of 1835 cholecystectomy specimens. Gallbladder cancer is

more common in females (6, 85.71%) than in males (1 case, 14.78%).

Chronic cholecystitis accounted for the majority of the cases (1703, or 92.8%), followed by acute cholecystitis (66, or 3.6%), Xanthogranulomatous, cholecystitis (30, or 1.6%), gangrenous cholecystitis (6, or 0.32%), follicular cholecystitis (3, or 0.16%) and one case (0.05%) each of cholesterolosis, foci of chronic inflammation, hemorrhagic infarction and empyema gallbladder. 13 cases (0.79%) was partially or fully utilized (**Fig. 1, Table 1**).

DISCUSSION

In our study, we examined 1835 cholecystectomy specimens from the previous five years in the department of pathology (Histopathology) at Mayo Hospital in Lahore to see the prevalence of gallbladder cancer.

The results of our study showed that the mean age of patients was 41.07±12.577. The prevalence of gallbladder cancer in all cholecystectomy specimens is 0.4% as in tertiary hospital Pernambuco, Brazil [15].

A total of 1,370 gallbladder GC samples were sent for histological investigation, with seven (0.41%) being discovered to be malignant and just three cases (0.15%) having primary GBC in tertiary care hospitals in Malaysia same as in our research [6].

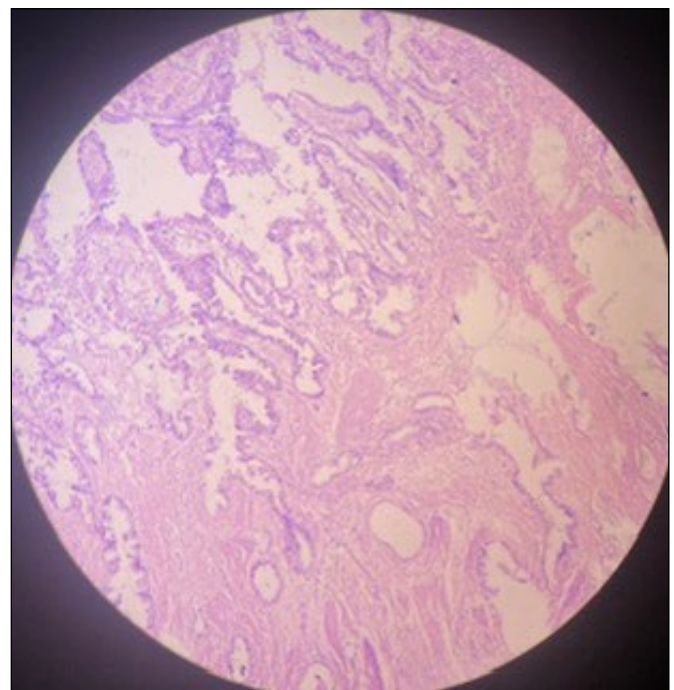


Fig. (1): Adenocarcinoma gallbladder involving muscularis mucosa. 10x H&E section.

Gallbladder cancer is predominantly present in females (85.71%) than in males as in many international studies (14.78%) [6].

We have also seen that chronic cholecystitis present in the majority of the cases (92.8%), followed by acute cholecystitis (3.6%), Xanthogranulomatous cholecystitis (1.6%), gangrenous cholecystitis (0.34%), follicular cholecystitis (0.016%), and one case (0.05%) each of cholesterolosis, foci of chronic inflammation, hemorrhagic infarction and empyema gallbladder [2].

A total of two hundred eighty-two gallbladder specimens were examined at IUH in Hyderabad. Seventy-five of them were males, while the remaining two hundred and seven were females. CC was the most common histopathological finding in 64.6% of the cases, followed by AC / empyema in 33.5% of the cases, and gallbladder cancer in only 1.4% of the cases.

In a study of 1122 cholecystectomy specimens, Khoo *et al.* in Johor, Malaysia discovered 9 (0.8%) occurrences of gallbladder cancer, with 77.77% of incidental carcinoma and 22.22% of clinically suspected carcinoma. Three of the seven patients of incidental carcinoma were males and four were women, with one case of clinically probable gallbladder carcinoma each [17].

Gallbladder polypoidal tumors affect 5% of adults and are sometimes mistaken for gallbladder cancer. 215 Adenomas, leiomyomas, and inflammatory polyps account for the remaining two-thirds of polyps. Although gallbladder polyps are sometimes linked with biliary colic, most of them show no symptoms and are discovered by chance when abdominal imaging is done for another reason. Big polyps (>11 millimeters), a solitary or septate mass, concomitant gallstones, age of the patient greater than fifty, and, most critically, rapid polyp growth are all characteristics that indicate malignancy [18].

In the study by Mittal *et al.* of 1305 patients, incidental GBC has been found in 13 patients out of 610 macroscopically abnormal gallbladder specimens [19]. There has been a concern about the presence of early GBC in a normal-looking gallbladder specimen. However, simple cholecystectomy is considered adequate in these patients, and no further therapy is required [20].

In their study, the surgeon first identified the risk factors for GBC and then performed a macroscopic analysis of the gallbladder specimen just after surgery. All three histopathologically confirmed GBCs in their study were suspected by the surgeon following macroscopic analysis. Furthermore, Wrenn *et al.* have concluded

that selective screening based on risk factors (including older patients), intraoperative findings, and on-table examination of the specimen may be a feasible and more cost-effective alternative to universal screening [21].

It is noted that almost all of these studies suggesting routine HPE are from geographical areas with a relatively high incidence of GBC. Moreover, most of the studies that recommend submitting all gallbladder specimens for routine HPE regardless of its gross appearance report a definitive gross abnormality in the cases diagnosed with incidental GBC. For example, Kalita *et al.* have found 18 unsuspected incidental GBC cases in a study of 4115 patients [22].

In our study, we did not take gallstones' relation with the prevalence of gallbladder carcinoma under consideration because it would complex our specific study.

The limitation of our study is the lack of coordination with all surgical units. A lot of specimens are outsourced at private setup, so there is missing data regarding cancer numbers.

Based on the study, the frequency of gallstones is very low but common in females so regular checkup by simple ultrasonography is recommended to pick up disease at an early stage.

CONCLUSION

We have concluded that chronic cholecystitis is the most common disease in cholecystectomy specimens followed by acute cholecystitis, Xanthogranulomatous cholecystitis, gangrenous cholecystitis, follicular cholecystitis, and empyema gallbladder. Gallbladder carcinoma is very rare and more common in females than males. Early diagnosis can reduce morbidity and mortality as the carcinomas are usually late to present with nonspecific symptoms. These are moderate to poorly differentiated thus carrying poor prognosis. The incidence is low and is usually in the background of chronic cholecystitis.

ETHICAL APPROVAL

Ethical approval was obtained from King Edward Medical University, Lahore (REF letter No. 382/RC/KEMU, Dated: 14-03-2022). All procedures performed in studies involving human participants were following the ethical standards of the institutional and/ or national research committee and with the Helsinki Declaration.

CONSENT FOR PUBLICATION

Written informed consent was taken from the participants.

AVAILABILITY OF DATA

The data set may be acquired from the corresponding author upon a reasonable request.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHOR'S CONTRIBUTION

All the authors contributed equally to the publication of this article.

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