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Original Research Article

# Incidence of Carcinoma Gallbladder in Patients Undergoing Cholecystectomy and its Correlation with Clinicopathological Profile

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**Abstract**

**Background**: Gallstone disease, common in India, can lead to carcinoma gallbladder due to chronic mucosal irritation. The rate of incidental carcinoma found after cholecystectomy differs by region, highlighting the importance of early detection for improved prognosis. The present study aimed to determine incidence of carcinoma gall bladder in patients undergoing cholecystectomy and its correlation with clinicopathological profile of patients.

**Methodology**: This prospective observational study was conducted in department of general surgery at Pt. JNM medical college from January 2016 to August 2022, including 149 patients with symptomatic, ultrasonography confirmed gallstone disease undergoing elective cholecystectomy. Data on clinical, demographic, and histopathological parameters were analyzed to determine the incidence and associations of incidental gallbladder carcinoma.

**Results**: The rate of incidental carcinoma of gall bladder in our setting was found to be 0.67. Out of 149 patients, 1(0.67%) patients had gall bladder polyp and 148(99.33%) patients didn't had gallbladder polyp. 91(61.07%) had gall bladder wall thickness of 2-3mm and 58 (38.93%) patients had gall bladder wall thickness of 3-5mm. 4 (2.7%)patients had tenderness per abdomen,4(2.7%) patients had guarding, 2(1.3%) patients had rigidity,4(2.7%) patients had rebound tenderness,4(2.7%) patients had Murphy's sign positive, and 3(2.0%) patients had abdominal distension.

**Conclusion**: We concluded that most common histopathological finding in patients undergoing cholecystectomy was chronic cholecystitis with cholelithiasis. The one case diagnosed with carcinoma gall bladder was adenocarcinoma in histopathological types. As our data might not be sufficient for correlation of various variables but given that early diagnosis in carcinoma gallbladder can drastically change outcome in patients, Histopathological analysis of all gallbladder specimen in elective as well as emergency cholecystectomy should be mandatory.

**Keywords**: Incidence, GB Carcinoma, Cholecystectomy, Clinicopathological Profile.

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## Introduction

Gallbladder carcinoma is the most common malignancy of the biliary system and the fifth most common malignancy of the gastrointestinal tract worldwide.[1,2] It is an aggressive malignancy with an overall poor prognosis. Due to the non-specific nature of symptoms, most of the patients present with advanced disease hence early diagnosis of carcinoma gallbladder becomes necessary. India is a high incidence area for GBC.

GBC is one of the three leading cancers among women of North and North-east India. The age standardized rate (ASR) for GBC in women of North and north-east India are 11.8/100,000 population and 17.1/100,000 population respectively.[3] It is similar to the high incidence areas such as Bolivia (14/100,000) and Chile (9.3/100,000) and higher than that found in other parts of Asia: Thailand (7.4), South Korea, Nepal (6.7) and Bangladesh (5.1) per 100,000 population.[4] The incidence has been steadily rising in India among women as well as men. The average age-adjusted rate among women has increased from 6.2/100,000 in 2001–2004 to 10.4/100,000 in 2012–2014.[5]

This data is from 30 population-based cancer registries from all over India, which were set up by

the Indian Council of Medical Research ICMR.[3] The incidence rate has shown a rise in Mumbai registry, due to persons ethnically belonging to high incidence area migrating to Mumbai either for employment or for treatment. The term incidental was coined to denote a 'histological surprise' of gallbladder cancer in a patient treated with simple cholecystectomy for gallstone disease, cholecystitis or gallbladder polyps.

Incidental gallbladder cancer (IGBC) also called as occult/in apparent/missed Gall bladder carcinoma is defined as the Gall bladder carcinoma diagnosed during or after the cholecystectomy done for benign gallbladder disease. It is reported that Gall bladder carcinoma incidentally detected by histopathological examinations after open or laparoscopic cholecystectomy is encountered in 0.2–2.9 % of patients undergoing cholecystectomy[6] Of all Gall bladder carcinoma 27–41 % are incidental carcinoma gallbladder. Most of these cases unsuspected pre-operatively belong to the category of pT1 and pT2 (early Gall bladder carcinoma). From this study, we are reporting our experience with gallbladder cancer which was incidentally diagnosed during or after a cholecystectomy which was performed for reasons other than carcinoma gallbladder.

**Objectives:** To determine incidence of carcinoma gall bladder in patients undergoing cholecystectomy and its correlation with clinicopathological profile of patients.

## Material and Methods

This retrospective observational study was conducted in department of general surgery at Pt. JNM medical college as a 5 year retrospective observational study from January 2016 to August 2022. Case files of patients undergoing elective and emergency cholecystectomy were analyzed retrospectively. Total 149 cases were taken into considerations which fulfilled inclusion and exclusion criteria. In all cases demographic profile, chief complaints, duration of presenting complaints, personal history, examination data, biochemical investigation, blood investigations, radiological investigations, intraoperative findings and histopathological findings were collected and recorded on a specially prepared pro forma. Data collected was then tabulated and data analysis was done.

**Sampling procedure:** All patients who underwent cholecystectomy fulfilling inclusion and exclusion criteria.

**Sample size:** In this study all patients who underwent cholecystectomy for gall bladder pathology in last 5 years were included.

Sample size = All patients underwent cholecystectomy from Jan. 2016 up to Aug.2022 for gall bladder conditions

### Data Collection

1. Data was collected from medical records department of all patients undergoing cholecystectomy
2. All patient who are undergoing cholecystectomy at Dr. BRAMH Raipur in department of general surgery during last 5 years
3. AGE > 18 YEAR

### Inclusion Criteria:

- Patient age more > 18 years
- Patients undergoing routine cholecystectomy and emergency
- Cholecystectomy
- Documents complete

### Exclusion Criteria

- Age <18 years
- Already diagnosed cases of carcinoma gall bladder
- Documents incomplete

## Observation and Results

**Table 1: Age distribution among patients undergoing cholecystectomy for benign gall bladder diseases**

| Age in years | Freq. | Percent | Frequency of Cancer of gall bladder |
|---|---|---|---|
| 21-30 years | 4 | 2.68 | 0 |
| 31-40 years | 29 | 19.46 | 0 |
| 41-50 years | 62 | 41.61 | 1 |
| 51-60 years | 40 | 26.85 | 0 |
| 61-70 years | 12 | 8.05 | 0 |
| >70 years | 2 | 1.34 | 0 |
| Total | 149 | 100 | 1 |

The mean age of study subjects was 48.23± 9.38 years.

As per table no 1, in 149 patients who underwent cholecystectomy for benign gall bladder conditions most common age group for cholecystectomy is 41-50. Age of patient diagnosed with carcinoma gall bladder was 45 years. Also, out of 149 patients who underwent cholecystectomy for benign gall bladder diseases, 113 (75.8%) of patients were female, 36 (24.1%) patients were male and the

patient diagnosed with carcinoma gallbladder was female.

**Table 2: Chief complaints in patients undergoing cholecystectomy**

| Complain | Freq. | Percent | Frequency of Cancer of gall bladder |
|---|---|---|---|
| Pain abdomen | 148 | 99.33 | 1 |
| Vomiting | 58 | 38.93 | 0 |
| Nausea | 58 | 38.93 | 0 |
| Jaundice | 3 | 2.01 | 0 |
| Melena | 4 | 2.68 | 0 |

Above table showed that most common symptom was (99.33%) pain abdomen 3 patients had history of jaundice, 58 patients had history of nausea and vomiting, 4 patients had history of melena. The patient diagnosed with carcinoma gallbladder had symptom of pain abdomen.

**Table 3: History of associated Co morbidities in patients undergoing cholecystectomy for gallbladder diseases**

| Comorbidity | Frequency of Comorbidity | Percentage | Frequency of carcinoma gallbladder |
|---|---|---|---|
| Hypertension | 28 | 18.79 | 1 |
| Diabetes | 36 | 24.16 | 0 |
| Sickle cell disease | 0 | 0.00 | 0 |
| Family history of gall bladder disease | 3 | 2.01 | 0 |
| Smoking | 5 | 3.36 | 0 |

In our study, 28 patients had history of hypertension, 36 patients had association with diabetes, 3 patients had family history of gallbladder disease and 5 patients had history of smoking. None of the study population had history of sickle cell disease. The patient diagnosed with carcinoma gall bladder had positive history for hypertension.

**Table 4: Duration of abdomen pain in patients undergoing cholecystectomy for gallbladder diseases**

| Duration of abdomen pain | Freq. | Percent | Frequency of Cancer of gall bladder |
|---|---|---|---|
| 1-3months | 110 | 73.83 | 1 |
| 4-6months | 25 | 16.78 | 0 |
| 7-9months | 7 | 4.7 | 0 |
| 10-12months | 5 | 3.36 | 0 |
| >12 months | 2 | 1.34 | 0 |
| Total | 149 | 100 | 1 |

Out of 149 patients who underwent cholecystectomy for benign gall bladder disease, duration of pain abdomen for 73% of patients was 1 to 3 months, the patients diagnosed with carcinoma gallbladder had duration of pain abdomen for 2 months.

**Table 5: General examination among patients undergoing cholecystectomy for gall bladder diseases**

| General examination | Freq. | Percent | Frequency of Cancer of gall bladder |
|---|---|---|---|
| Pallor | 2 | 1.34 | 0 |
| Icterus | 4 | 2.68 | 1 |
| Cyanosis | 0 | 0 | 0 |
| Clubbing | 0 | 0 | 0 |
| Generalised lymphadenopathy | 0 | 0 | 0 |
| Pedal Edema | 0 | 0 | 0 |

**Table 6: Per abdomen examination among patients undergoing cholecystectomy for gall bladder diseases**

| Per abdomen examination | Freq. | Percent | Frequency of Cancer of gall bladder |
|---|---|---|---|
| Tenderness per abdomen | 4 | 2.7% | 1 |
| Guarding | 4 | 2.7% | 1 |
| Rigidity | 2 | 1.3% | 0 |
| Rebound tenderness | 4 | 2.7% | 1 |
| Murphy's sign | 4 | 2.7% | 1 |
| Abdominal distension | 3 | 2.0% | 1 |
| Hepatomegaly | 0 | 0.0% | 0 |
| Splenomegaly | 0 | 0.0% | 0 |
| Ascites | 0 | 0.0% | 0 |

**Table 7: Size of stone among patients undergoing cholecystectomy for gall bladder diseases**

| Size of stone | Freq. | Percent | Frequency of Cancer of gall bladder |
|---|---|---|---|
| 0 mm | 15 | 8.22 | 0 |
| 4-8mm | 27 | 18.49 | 1 |
| 9-13mm | 52 | 35.62 | 0 |
| 14-18mm | 32 | 21.92 | 0 |
| 19-23mm | 13 | 8.9 | 0 |
| 24-30mm | 10 | 6.85 | 0 |
| Total | 149 | 100 | 1 |

Out of 149 patients, maximum patients (35.62%) had a stone size of 9 - 13mm, followed by 21.92% patients who had a stone of size 14-18mm. The patient diagnosed with carcinoma gallbladder had stones of size 5mm.

**Table 8: No. of stones intra operatively in patients who underwent cholecystectomy for gall bladder conditions**

| No. of stones intra operatively | Freq. | Percent | Frequency of Cancer of gall bladder |
|---|---|---|---|
| 0 | 25 | 16.78 | 0 |
| 1 | 1 | 0.67 | 0 |
| 4 | 9 | 6.04 | 0 |
| 5 | 9 | 6.04 | 1 |
| 6 | 8 | 5.37 | 0 |
| 7 | 18 | 12.08 | 0 |
| 8 | 21 | 14.09 | 0 |
| 9 | 40 | 26.85 | 0 |
| 10 | 6 | 4.03 | 0 |
| 11 | 5 | 3.36 | 0 |
| 12 | 4 | 2.68 | 0 |
| 14 | 3 | 2.01 | 0 |
| Total | 149 | 100 | 1 |

Out of 149 patients who underwent cholecytectomy for benign gall bladder conditions, patient diagnosed with carcinoma gallbladder had 9 gallbladder stones.

**Table 9: Histopathological findings among patients undergoing cholecystectomy for gall bladder diseases**

| Histopathological findings | Freq. | Percent |
|---|---|---|
| Acute cholecystitis | 2 | 1.34 |
| Acute cholecystitis with cholelithiasis | 1 | 0.67 |
| Acute on chronic cholecystitis with cholelithiasis | 1 | 0.67 |
| Adenocarcinoma gallbladder, fundus | 1 | 0.67 |
| Chroniccholecystitis | 9 | 6.04 |
| Chronic Cholecystitis with cholelithiasis | 135 | 90.6 |
| Total | 149 | 100 |

Out of 149 patients who underwent cholecystectomy for benign gall bladder conditions .One patient was diagnosed with adenocarcinoma gallbladder while 90.6% was diagnosed with chronic cholecystitis.

**Table 10: Post op analysis of stones among patients undergoing cholecystectomy for gall bladder diseases**

| Type of stones | Freq. | Percent | Frequency of Cancer of gall bladder |
|---|---|---|---|
| Cholesterol | 50 | 33.56 | 0 |
| Mixed | 89 | 59.73 | 1 |
| Non | 10 | 6.71 | 0 |
| Total | 149 | 100 | 1 |

As per table 10, 89% of patients had mixed type of stones intraoperatively and 36% had cholesterol stones intraoperatively, the patient diagnosed with carcinoma gallbladder had mixed type of gallbladder stones.

**Table 11: Total incidence of carcinoma gallbladder**

| Total No Patients | Patient not having carcinoma gallbladder | Patient having carcinoma gallbladder | Incidence of Cancer of gall bladder |
|---|---|---|---|
| 149 | 148 | 1 | 0.67 |

| | | | |
|---|---|---|---|
| Total | 148 | 1 | 0.67 |

As per table 11 Incidence of carcinoma gallbladder in patients undergoing cholecystectomy is 0.67.

## Discussion

In my current study records of 149 patients were analysed. Most common age group for patients undergoing cholecystectomy was 41-50.The mean age of our 149 patients is 48.23+9.38 years. Most of these patients had chronic cholecystitis (90.6%) as per Sol lee et al 2011[7], most common age group for chronic cholecystitis 50-60 years.

In our study out 149 patients who underwent cholecystectomy for benign gall gallbladder diseases, 113 were female (75.6%), as most of them were diagnosed with chronic cholecystitis, it is consistent with female gender being a predisposition for chronic calculus cholecystitis. (Randi G et al 2006).[8] Out of 149 patients 148(99.33%) patients had history of pain abdomen, 58(38.93%) had history of vomiting, 58(38.93%) patients had history of nausea, 3(2.01%) patients had history of jaundice, 4 (2.68%) patients had history of melena ,28(18.79%). 110(73.83%) patients had history of abdominal pain for 1- 3 months, 25 (16.78%)patients had history of abdominal pain for 4-6 months, 7(4.7%)patients had history of abdominal pain for 7-9 months,5 (3.36%) patients had history of abdominal pain for 10-12 months and 2 (1.34%) had history of abdominal pain for >12 months.

The patient diagnosed with carcinoma gall bladder had history of pain abdomen vomiting and nausea. Pain is the most constant symptom in carcinoma gallbladder, it is present in 72–77% of patients. Jaundice is observed in 58% of cases as per Von Meyenfeldt EM, et al.[9] 28 patients (18.79) patients had history of hypertension, 36(24.16%) patients had history of diabetes,3(2.01%) patients had family history of gall bladder disease and 5(3.36%) had history of smoking. The patient diagnosed with carcinoma gall bladder had history of hypertension and no history of diabetes mellitus, family history of gall bladder disease or history of smoking. Carcinoma gallbladder has consistently been associated with an increased risk of cardiovascular diseases and diabetes type 2.

Out of 149 patients,91(61.07%) had gall bladder wall thickness of 2-3 mm, and 58(38.93%) patients had gall bladder wall thickness of 3-5mm. Patient diagnosed with carcinoma gallbladder had gall bladder wall thickening of 5mm. As per Sun Park M.D. et al[10] mean gall bladder wall thickening in patients undergoing carcinoma gall bladder was 12mm with significant association between increased gall bladder wall thickening and carcinoma gall bladder. Intraoperatively, Out of 149 patients, 1(0.67%) patients had gall bladder polyp and 148(99.33%) patients didn't had gallbladder polyp. Polyps ≥10 mm in diameter are associated with cancer and a prophylactic cholecystectomy is recommended, as well as in patients with sessile polyps and if increased polyp size ≥2 mm between radiologic examinations (Wiles R, et al 2009)11.

After our study Incidence of carcinoma gallbladder in patients undergoing cholecystectomy was found to be 0.67% while incidence of carcinoma gallbladder in Shrestha R et al 2009[12] was 1.4%, while Vibhor Jain et al 2021[13] incidence was as 2.5%. The variety in incidence might be due to less number of cholecystectomy used for study purpose. Out of 149 patients, 2(1.34%) patients had acute cholecystitis,1(0.67%) patient had acute cholecystitis with cholelithiasis, 1(0.67%)patient had acute or chronic cholecystitis with cholelithiasis, 1(0.67%) patient had adenocarcinoma of fundus region of gall bladder, 9(6.04%) patient had chronic cholecystitis, and 135(90.6%) patients had chronic cholecystitis with cholelithiasis.

## Conclusion

In our study we concluded that pre-operative diagnosis of carcinoma gallbladder is necessary. Clinicopathological profile of carcinoma gall bladder might be overlapping with benign gall bladder diseases but being thorough with our clinical, radiological and blood investigation we can diagnose carcinoma gall bladder pre operatively. The rate of incidental carcinoma of gall bladder in our setting was found to 0.67. Occult carcinoma GB diagnosed incidentally on histopathological examination of post-cholecystectomy specimen are usually detected at earlier stages and thus have better prognosis.

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