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A clinical study on patients undergoing extended cholecystectomy for gall bladder cancer with special emphasis on short-term outcome

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ABSTRACT

Background: Gall bladder cancer (GBC) is an aggressive disease often presenting at an advanced stage. It is the most common hepatobiliary malignancy in eastern India. Extended cholecystectomy (EC), the currently accepted definitive surgery for GBC, being a major surgical procedure, has considerable morbidity and mortality. **Aims and Objectives:** This study aims to study the profile of patients undergoing EC and evaluate the peri-operative events and post-operative outcome. **Materials and Methods:** It was conducted over 1.5 years. 30 patients undergoing EC for radiologically-suspicious/peri-operative findings suggestive of GBC were considered as per the inclusion and exclusion criteria. **Results:** Of the 30 patients studied, 24 (80%) were >50 years age, 20 (66.7%) were female, 27 (90%) were non-vegetarian, 26 (86.7%) had pain abdomen, and 7 (23.3%) had pallor. No patient had a lump abdomen, jaundice, icterus, or clinically detectable lymphadenopathy. On ultrasonography (USG), 22 (73.3%) had intraluminal mass, 25 (83.3%) had gallstones; on computed tomography scan, 24 (80%) had intraluminal mass, 17 (56.7%) had no adjacent structure invasion, and 11 (36.7%) had liver bed invasion. None required resection of the extrahepatic biliary tree. Post-operatively, 7 (23.3%) required intensive care, 1 (3.3%) had a hematoma, 6 (20%) had surgical site infection, and 4 (13.3%) had bile leak. Histopathology showed adenocarcinoma gall bladder in 25 (83.3%) and papillary carcinoma in 1 (3.3%). Post-surgery USG at 1 month was normal in 25 (83.3%) patients, and 4 (13.7%) had mild collection in the Hepatorenal Pouch of Morrison. All had a normal USG report at 3 months post-surgery. **Conclusion:** GBC is more common in females aged 51–60 years. Pain abdomen is the most common symptom. Post-operative intensive care is not required for majority of the patients undergoing EC. Most complications can be managed conservatively.

Key words: Gall bladder cancer; Hepatobiliary malignancy; Extended cholecystectomy; Post-operative outcome

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INTRODUCTION

Gall bladder cancer (GBC) is the most common biliary malignancy and is the 5th most common gastrointestinal cancer.[1] Hundal and Shaffer showed that GBC, though generally considered rare, is the most common malignancy of the biliary tract, accounting for 80–95% of biliary tract cancers.[2] Because of its aggressive nature and absence of symptoms in the initial stage, it is usually diagnosed at an advanced stage, resulting in a median survival of less than 6 months.[2] India has a high incidence of GBC and contributes to about 10% of the global GBC burden.[3] Recent advances in the understanding of its tumor biology, progress in diagnostic and surgical extirpative techniques, have motivated a fresh approach to this once universally fatal disease; indeed, the possibility of cure is real for a

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subset of patients presenting with GBC. Most patients have advanced disease at presentation and are not candidates for surgical therapy.[3,4] Surgery is indicated in only very selected cases. The standard template on which GBC operations are based is extended cholecystectomy (EC) with a 2 cm *en bloc* resection of a wedge of segments IV B and V and lymphadenectomy of cystic, pericholedochal, periportal, and posterior pancreaticoduodenal lymph nodes (LNs) residing in the hepatoduodenal ligament (HDL) and local aortocaval LNs.[5] R0 resection can provide potential cure for patients with GBC. As EC is a major surgical procedure, complications such as bleeding, intra-abdominal collection, wound infection, bile leak are encountered. Post-operative outcome is also related to the intra-operative events and pre-operative nutritional status of the patient.

Very few studies have been done in India on the post-operative outcome following such a radical procedure. This study aims to study the profile of patients undergoing EC, to evaluate the intra-operative events and post-operative outcomes within 3 months.

Aims and objectives

The aim of the study is to evaluate the effect of Extended Cholecystectomy for Gall Bladder Cancer in peri-operative period and outcomes in early post-operative period in a Tertiary care Institution.

The specific objectives are to study the profile of patients undergoing extended cholecystectomy, to evaluate the Intra-operative events of surgery and its effect on post-operative period and to evaluate the mortality, morbidity, disease free period, presence of residual disease and quality of life within 3 months.

MATERIALS AND METHODS

This is an institution-based observational study performed at the Department of General Surgery, Institute of Post Graduate Medical Education & Research (IPGME&R), Kolkata, from March 2021 to September 2022.

Study population included all patients with pre-operative investigations suggestive of GBC or intraoperative suspicion of GBC, attending the general surgery outpatient department of IPGME&R, Kolkata, from March 2021 to September 2022. A total of 30 patients meeting the inclusion and exclusion criteria were considered (Figure 1). After taking approval from the Institutional Ethics Committee (IPGME&R/IEC/2021/248 dated 18/03/2021), the study was carried out in the Department of General Surgery, IPGME&R, Kolkata.

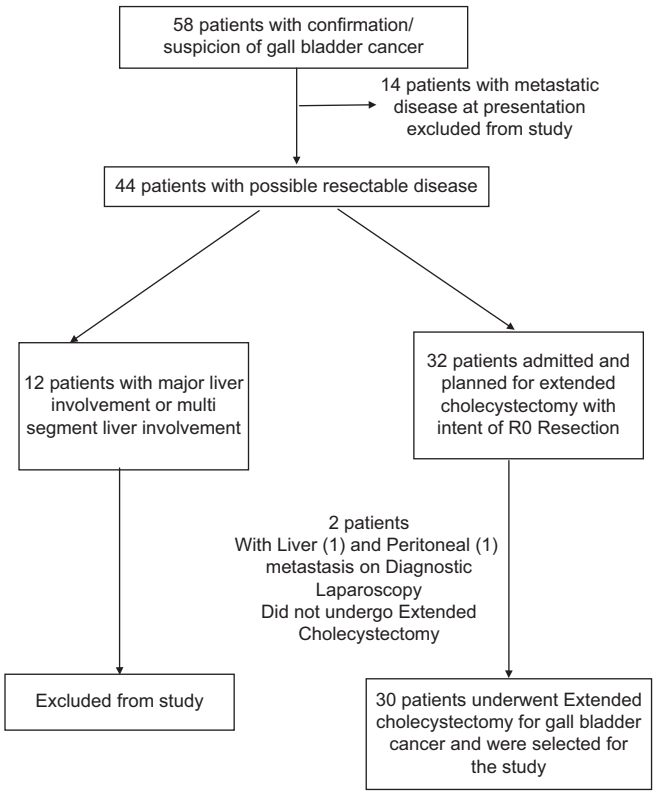

Figure 1: Selection of patients for the study

After taking informed consent from the patients, a detailed history-taking, clinical examination, and radiological investigations (ultrasonography [USG] and computed tomography [CT] scan of abdomen) were done. Intra-operatively, the presence of metastasis, invasion of other structures was assessed. The outcome was based on the hospital stay, morbidity and mortality and histopathology report, and follow-up of patient at 1-month and 3-month post-surgery, since the chance of post-operative morbidity and mortality continues beyond 30 days, till 90 days.[6]

Inclusion criteria

All the patients undergoing EC for GBC in IPGME&R, Kolkata, between March 2021 and September 2022 with pre-operative imaging and incidental intraoperative suspicion of GBC were included in the study.

Exclusion criteria

Patients unwilling to take part in the study, those with radiologically-detected/histologically-confirmed metastasis, those with primary diagnosis other than GBC and those with multisegment liver involvement were excluded.

Statistical analysis

For statistical analysis, data were entered into a Microsoft Excel spreadsheet and then analyzed by the Statistical Package for the Social Sciences (version 27.0; SPSS Inc., Chicago, IL, USA) and GraphPad Prism version 5. Data

had been summarized as mean and standard deviation for numerical variables and count and percentages for categorical variables. Z-test (standard normal deviate) was used to test the significant difference of proportions. Once a t-value was determined, a P-value was found using a table of values from Student's t-distribution. P≤0.05 was considered statistically significant.

RESULTS

In our study, 6 (20.0%) patients were ≤50 years of age, 13 (43.3%) patients were 51–60 years of age, 10 (33.3%) patients were 61–70 years of age, and 1 (3.3%) patient was 71–80 years of age which is significant (P=0.00026, Z-value=3.6628). 20 (66.7%) patients were female, 10 (33.3%) were male, with female-to-male ratio=2:1, which is significant (P=0.00988, Z-value=2.582) (Table 1).

27 (90.0%) patients were non-vegetarian and 3 (10.0%) patients were vegetarian which was significant (P<0.00001; Z-value=6.1968) (Table 1).

26 (86.7%) patients had pain abdomen as a symptom whereas 4 patients (13.3%) had no symptom of pain which was significant (P<0.00001; Z-value=5.6804). None of the 30 patients had lump abdomen or jaundice as a symptom. 15 (50.0%) patients had anorexia and 11 (36.7%) patients had significant weight loss. 7 (23.3%) patients had pallor while 23 (76.7%) did not have pallor which was significant (P<0.00001; Z-value=4.1312). None of the 30 patients had icterus, palpable lump, lymphadenopathy detected clinically, or tenderness (Table 1).

Regarding findings on USG, 22 (73.3%) patients had intraluminal mass in USG which was significant (P=0.0003; Z-value=3.6148); 2 (6.7%) patients had diffuse wall thickening, 13 (43.3%) had irregular wall thickening, and 15 (50.0%) had normal gall bladder (GB) wall thickness which was significant (P=0.0002; Z-value=3.7244); 25 (83.3%) patients had gall stone which was significant (P<0.00001; Z-value=5.164) (Table 2).

Regarding CT findings, 24 (80.0%) patients had an intraluminal mass which was significant (P<0.00001; Z-value=4.6476); 14 (46.7%) patients had irregular wall thickening; 15 (50.0%) had normal GB wall thickening; 1 (3.3%) had diffuse wall thickening which was significant (P<0.00001; Z-value=4.0871); 7 (23.3%) patients had gall stones which was significant (P<0.00001; Z-value=4.1312); 11 (36.7%) patients had liver bed invasion; 1 (3.3%) had invasion of liver bed and colon; 1 (3.3%) had invasion of liver bed, colon, and stomach; 17 (56.7%) patients had no evidence of invasion; 2 (6.7%) patients had pericholedochal;

Table 1: Demographic and clinical profile of the patients undergoing EC

Demographic profile	Number (Percentage)
Age group (in years)	
≤50	6 (20%)
51–60	13 (43.33%)
61–70	10 (33.34%)
71–80	1 (3.33%)
Gender	
Female	20 (66.67%)
Male	10 (33.33%)
Food habits	
Non-vegetarian	27 (90%)
Vegetarian	3 (10%)
Clinical profile	
Pain abdomen	
Present	26 (86.67%)
Absent	4 (13.33%)
Lump abdomen	
Present	0 (0%)
Absent	30 (100%)
Jaundice	
Present	0 (0%)
Absent	30 (100%)
Anorexia	
Present	15 (50%)
Absent	15 (50%)
Significant weight loss	
Present	11 (36.67%)
Absent	19 (63.33%)
Pallor	
Yes	7 (23.33%)
No	23 (76.67%)
Icterus	
Present	0 (0%)
Absent	30 (100%)
Tenderness	
Present	0 (0%)
Absent	30 (100%)
Lymphadenopathy	
Present	0 (0%)
Absent	30 (100%)

EC: Extended cholecystectomy

8 (26.7%) had periportal lymphadenopathy whereas 20 (66.7%) had no lymphadenopathy on CT (Table 2).

The mean pre-operative CA-19.9 (U/mL) of patients was 347.3567±1043.8827 U/mL. The mean surgical duration of patients was 231.3333±37.6676 min and mean intra-operative blood loss (mL) of patients undergoing EC was 580.0000±232.5273 mL. 20 (66.7%) patients had intra-operative blood transfusion of 1 unit packed red blood cell (PRBC) and 10 (33.3%) patients had intra-operative blood transfusion of 2 units PRBC, with mean intra-operative blood transfusion being 1.3333±0.4795 units PRBC.

None of the 30 patients undergoing EC had any evidence of distant metastasis detected during surgery and none required any resection of extrahepatic biliary tree. 1 (3.3%) patient had colon invasion; 1 (3.3%) patient had colon

Table 2: Preoperative radiological findings of the patients

Features	Number (Percentage)	P-value	Z-value
Ultrasonography findings			
Intramural mass			
Present	22 (73.33%)		
Absent	8 (26.67%)	0.0003	3.6148
GB wall thickening			
Diffuse	2 (6.67%)		
Irregular	13 (43.33%)		
Normal	15 (50%)	0.0002	3.7244
Gall Stones			
Present	25 (83.33%)		
Absent	5 (16.67%)	<0.00001	5.164
Computed tomography findings			
Intraluminal mass			
Present	24 (80%)		
Absent	6 (20%)	<0.00001	4.6476
Gall bladder wall thickening			
Diffuse	1 (3.33%)		
Irregular	14 (46.67%)		
Normal	15 (50%)	<0.00001	4.0871
Gall stones			
Present	7 (23.33%)		
Absent	23 (76.67%)	<0.00001	4.1312
Lymphadenopathy			
None	20 (66.67%)		
Pericholedochal	2 (6.66%)		
Periportal	8 (26.67%)	<0.00001	4.8222
Adjacent organ invasion			
None	17 (56.67%)		
Liver bed	11 (36.67%)		
Liver bed+colon	1 (3.33%)		
Liver bed, colon, stomach	1 (3.33%)	<0.00001	4.5075

Table 3: The distribution of post-operative outcomes

Post-operative management	Number (Percentage)
Post-operative blood transfusion (units of PRBCs)	
0	21 (70%)
1	8 (26.67%)
2	1 (3.33%)
Post-operative intensive care (number of days)	
0	23 (76.67%)
1	3 (10%)
2	2 (6.67%)
3	1 (3.33%)
10	1 (3.33%)
Post-operative complications	
Hematoma	
Yes	1 (3.33%)
No	29 (96.67%)
Intra-abdominal collection	
Yes	0 (0%)
No	30 (100%)
Surgical site infection	
Yes	6 (20%)
No	24 (80%)
Bile leak	
Yes	4 (13.33%)
No	26 (86.67%)
Post-operative chest complications	
Yes	9 (30%)
No	21 (70%)
Mortality within hospital stay	
Yes	1 (3.33%)
No	29 (96.67%)
Pathological findings	
Final histopathology	
Adenocarcinoma	25 (83.34%)
Papillary carcinoma	1 (3.33%)
Xanthogranulomatous cholecystitis	4 (13.33%)
Cystic duct margin (in cancer patients)	
Positive	0 (0%)
Negative	26 (100%)
Liver margin (in cancer patients)	
Positive	0 (0%)
Negative	26 (100%)
Tumor status (pT)	
T1	12 (46.51%)
T2	11 (42.31%)
T3	3 (11.54%)
Lymph node status (pN)	
N0	9 (34.61%)
N1	14 (53.85%)
N2	3 (11.54%)
Follow-up	
Post-operative USG at 1 month	
Mild collection in the hepatorenal pouch of Morrison	4 (13.79%)
Normal	25 (86.21%)
Post-operative USG at 3 months	
Normal	29 (100%)
Abnormal	0 (0%)
Ability to do regular activities after 1 month	
Able to do regular activities	23 (79.31%)
Mild impairment	6 (20.69%)

PRBC: Packed red blood cell

and stomach invasion. Both patients required resection of the involved segment of colon or stomach with primary repair. Intra-abdominal drain was placed for all patients in the Hepatorenal Pouch of Morrison (HRPM). 14 (48.3%) patients had drain removed on POD 4. The mean drain removal was on day 7 for patients having bile leakage.

8 (26.7%) patients needed post-operative blood transfusion of 1 unit PRBC, whereas 1 (3.3%) patient required 2 units PRBC transfusion; mean post-operative blood transfusion was 0.3333±0.5467 units PRBC (Table 3).

Regarding post-operative intensive care, 3 (10.0%) patients required it for 1 day, 2 (6.7%) patients required it for 2 days, 1 (3.3%) patient required it for 3 days, 1 (3.3%) patient required it for 10 days, and 23 (76.7%) patients did not require it with mean post-operative intensive care requirement of patients being 0.6667±1.9179 days (Table 3).

Only 1 (3.3%) patient had a hematoma which was managed conservatively and 6 (20.0%) patients had surgical site infection (SSI). No patient had any intra-abdominal collection during the course of hospital stay. 4 (13.3%)

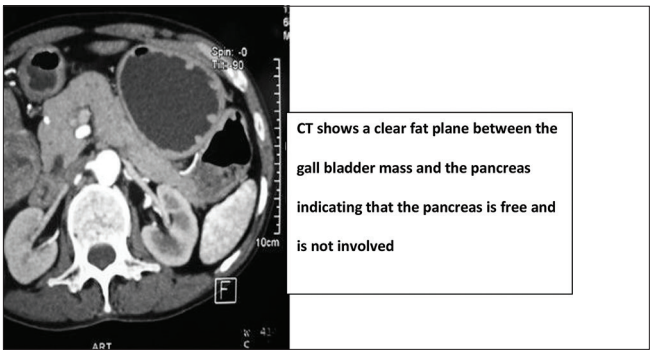

Figure 2: The computed tomography scan findings of a gall bladder mass

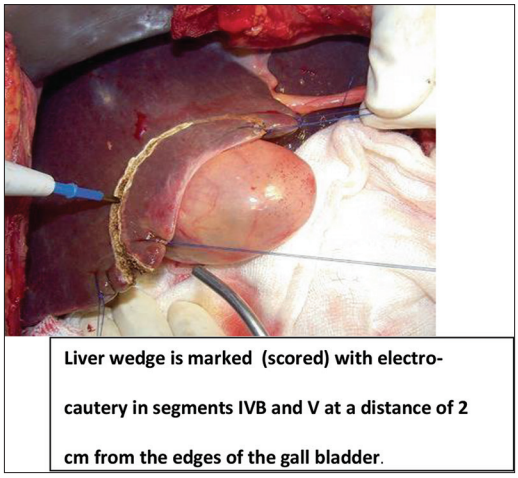

Figure 3: The scoring of liver with diathermy during the procedure of extended cholecystectomy

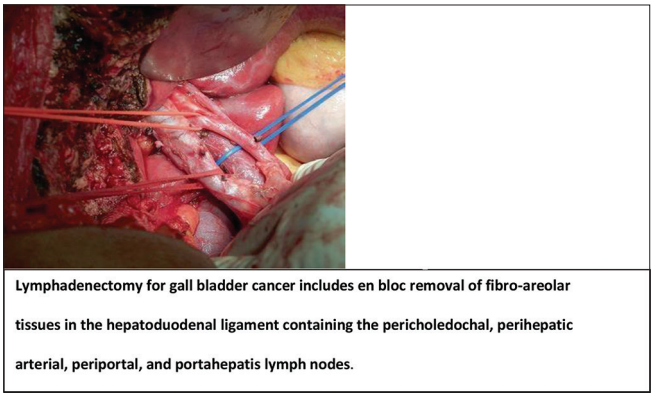

Figure 4: The structures in the porta hepatis-common bile duct, hepatic artery, and portal vein after lymph nodal clearance

patients had bile leak. 1 (3.3%) patient had mortality within hospital stay on post-operative day 10.

25 (83.3%) patients had adenocarcinoma of GB, 1 (3.3%) patient had papillary carcinoma of GB, and 4 (13.3%) patients had xanthogranulomatous cholecystitis on final histopathology. Among the patients with cancer (adenocarcinoma and papillary carcinoma), all had cystic duct margins negative for tumor cells (Table 3).

12 (46.2%) patients had pT1 tumor, 11 (42.3%) patients had pT2 tumor, and 3 (11.5%) patients had pT3 tumor on histopathology. 14 (53.8 %) patients had pN1, 3 (11.5%) patients had pN2 while 9 (34.6%) patients had pN0 status on histopathology. Among patients with pT1 tumor (12), 6 (50%) had pNo status and 6 (50%) had pN1 status. Among patients with pT2 tumor (11 patients), 3 (27.3%) had pNo status and 8 (72.7%) had pN1 status. Among patients with pT3 tumor (3 patients), all (100%) had pN2 nodal status. Thus, pT2N1 was the most common pathological stage in our study (8 patients).

The mean hospital stay of the patients was 5.4000±1.4044 days.

4 (13.8%) patients had mild collection in HRPM and 25 (83.3%) patients had a normal USG report without any collection at 1 month after surgery. All 29 (96.7%) patients had a normal USG report at 3 months after surgery including the 4 patients who had mild collection in HRPM at 1 month.

The mean post-operative CA-19.9 value (at 1 month) of patients was 7.6654±5.1855 U/ml which was significantly lower than the preoperative value. 23 (76.7%) patients were able to do regular activities at the end of 1 month; 6 (20.0%) patients had mild impairment in doing regular activities at 1 month which was significant with mean time taken to return to work (days) of patients being 17.8276±3.3495.

DISCUSSION

GBC is a disease of the elderly with incidence increasing with age in both sexes but cases are reported even in young patients.[3]

GBC is a non-genital cancer which is more common in women than in men.[3] There is a strong female preponderance with a female-to-male ratio of 2–3:1 in most areas; but as high as 5:1 (age-standardized rate F: M=9.5:1.6) in some areas, e.g., Chile. Within India, the incidence is high in North, North-East, Central, and Eastern India and less common in South and West India.[3]

Fried food, junk food, vanaspati, frozen fish, dried fish, red meat, milled mustard oil, puffed rice containing urea, chili powder, less water consumption, extra salt, tobacco exposure, betel leaf, and alcohol consumption are significantly related with GB carcinoma.[7] Green tea, sunflower oil, fish intake more than twice weekly, sea fish, packaged milk, fruits, and green leafy vegetables confer a protective effect.[7]

GBC in the early stages can remain asymptomatic for a long. Even when symptomatic, it has no pathognomonic clinical features to enable early diagnosis as symptoms of

early GBC are nonspecific, e.g., dyspepsia, indigestion, or mimic those of gallstone disease, i.e., biliary colic, chronic cholecystitis. Symptomatic GBC presents with a wide range of symptoms-local, metastatic, and cancer-related. The most common symptom of obvious GBC is pain[8] but GBC patients may have pain due to associated gallstone.[9] There may be a change in the character of pain from long-standing, intermittent biliary colic to recent dull, continuous, diffuse pain in the right hypochondrium or epigastrium. Pain was present in 89% of 385 patients reported by Mishra et al., in 2017.[8]

Gallstones (GS) are the strongest risk factor for the causation of GBC – a strong association exists between the presence of GS and GBC.[10] The relative risk of developing GBC is several times higher for patients with cholelithiasis compared to those without GS[11] and even more with larger stones (>3 cm).[12]

Jaundice is seen in 1/4th–1/3rd of patients with clinically obvious GBC. Jaundice is caused by direct infiltration of the common bile duct (CBD) by GBC neck or by compression of the CBD by enlarged metastatic LNs in the HDL.

Anorexia, weight loss, generalized weakness, malaise, and lethargy are frequently present in patients with GBC and indicate advanced disease. The diagnosis of GBC should be considered in an elderly patient with constant right upper quadrant abdominal pain with weight loss or anorexia.[13] Appetite loss (60%) and weight loss (63%) were very common in 385 patients with GBC seen at a tertiary-level hospital in north India from 2003 to 2014.[8]

Since patients requiring major hepatectomy (thus at a relatively advanced stage) were excluded from the study, it may explain the absence of lump abdomen or jaundice as a symptom in the patients studied.

Anorexia and weight loss are corollaries of protein-calorie malnutrition in cancer patients playing an important role in the poor nutritional status of GBC patients.[14]

Pallor is often associated with malignancy given the poor nutritional status of the patient. Many patients with GBC may have pallor as a clinical finding.

Icterus may be present in a GB mass with involvement of the common hepatic duct or by compression by a periportal LN. A palpable lump indicates advanced disease and such patients are often found to be inoperable. Tenderness is usually absent in a GB mass. The presence of palpable lymphadenopathy, e.g., Virchow's node is an indicator of metastatic disease.

USG findings suggestive of GBC range from the presence of an intraluminal mass to irregular GB wall thickening. Finding an irregular GB wall on USG warrants further investigation by CT or magnetic resonance imaging (MRI). However, USG is an important tool in detecting GB pathologies suggestive of malignancy.[15]

USG has a higher sensitivity in detecting gallstones than CT/MRI and is the investigation of choice for cholelithiasis.[16]

CT is superior to USG in characterizing the nature of GB lesion, extent of invasion of the liver bed, surrounding structures and vessels, lymphadenopathy and thus may be helpful in detecting metastatic disease due to involvement of aortocaval or para-aortic LNs.[17] GBC may appear as a mass completely replacing the GB (Figure 2), a focal or diffuse asymmetric GB wall thickening, or intraluminal polypoidal lesion.[18] According to Jindal et al.,[19] mass replacing the entire GB was the most common imaging feature seen in 62.8% of the patients, followed by asymmetrical wall thickening of the GB in 45% of the patients and polypoidal intraluminal mass in 11.4% of the patients which is quite similar to the findings of our study.

Elevated levels of serum CA19.9 are found in many malignancies. Elevated CA 19.9 along with imaging of the GB has a very high sensitivity in GBC.[20] CA 19.9 values have been attempted to be used to predict resectability in advanced GBC.[21]

EC is a well-defined surgical procedure for GBC and according to Kapoor and Behari 2017a,[22] EC is defined as the removal of the GB, a non-anatomical 2 cm wedge of the liver in segments IVB and V around the GB bed (Figure 3) and regional lymphadenectomy (Figure 4).[22] R0 resection is associated with better prognosis and potential cure.

Complete resection is the only treatment modality that has the potential for cure in patients with GBC.[23]

Liver resection being an integral part of the surgery, a considerable amount of blood loss is encountered which can be minimized with the use of apparatus such as Harmonic-scalpel and Cavitron Ultrasonic Surgical Aspirator. Advanced disease and the need for extensive hepatic resection lead to excess blood loss in selected cases.

Patients with advanced disease or invasion of the liver bed and other adjacent structures require more blood transfusions than patients with early disease, owing to the more aggressive nature of surgery in advanced GBC.

Presence of metastatic disease can be detected preoperatively through high-resolution imaging, i.e., CT or MRI. Diagnostic laparoscopy is recommended to identify radiologically occult metastasis.[24] The presence of metastatic disease is a contraindication to surgery and only palliative therapy is recommended.

Patients with more intra-operative blood transfusions usually require more post-operative blood transfusions also as compared to other patients.

None of the patients with SSI required any intervention and were managed with antibiotics and regular dressings.

All 4 patients with bile leak (100%) were managed conservatively with antibiotics, watchful observation, and monitoring for signs of biliary peritonitis. None of the patients required any sort of intervention but required a prolonged period of abdominal drain *in situ* (7 days) compared to patients without bile leak. Biliary leak is a dreaded complication following EC. Most are self-limiting, responding to conservative management. Rarely, an endoscopic retrograde cholangiopancreatography stenting may be required. Development of biliary peritonitis should be promptly dealt with diagnostic laparoscopy and lavage or open drainage. Presence of a biloma or biliary collection is better drained by USG-guided percutaneous drainage than by surgery.

EC being a major surgical procedure has considerable morbidity and mortality dependent on the patient's general condition and stage of disease. In this study, the single mortality was that of a 62-year-old hypertensive woman, with extensive lymphadenopathy, invasion of the liver, colon, and stomach on CT. She underwent EC with resection of the involved segments of colon and stomach followed by primary repair. She was in the intensive care unit from the immediate post-operative period, developed pleural effusion with consolidation, was on non-invasive ventilator support and required pleural tapping to relieve her symptoms. She succumbed to the multiple complications 10 days after surgery.

Xanthogranulomatous cholecystitis (XGC) is a variant of long-standing chronic cholecystitis caused by GS with destructive inflammation.[25] It is seen as diffuse thick-walled GB, with submucosal hypoechoic/hypoattenuated nodules in the thick GB wall, GB mass with infiltration of adjacent organs and lymphadenopathy and mimics GBC on imaging and even at operation-XGC also carries a higher risk of GBC and the two (XGC and GBC) may co-exist.[25] Even imaging findings cannot distinguish between XGC and GBC reliably due to overlapping features.[26]

Papillary type of adenocarcinoma makes up about 25% of GBC producing a papillary overgrowth which grows within the lumen forming a bulky, slow-growing tumor. It is commonly associated with necrosis and infection. Patients with papillary GBC tend to have lower TNM stages of disease and higher overall survival (OS) and DFS.[27]

Since all patients in our study underwent R0 resection, we can conclude that the fall of CA19-9 value after surgery is predictive of R0 resection.

Not many patients reported any severe impairment of their daily lifestyle and were able to do regular household work with only minor fallbacks occasionally.

Limitations of the study

1. Small sample size.
2. It was a single-center study.
3. Short follow-up period to draw any meaningful conclusions regarding DFS and OS of the patients.
4. Exclusion of patients requiring major hepatectomy resulted in only the less advanced cases being selected possibly explaining better surgical and immediate post-operative outcome of patients in this study.

CONCLUSION

We conclude that GBC is more common in females, in the older population of 51–60 years. Pain abdomen is the most commonly reported symptom. Symptoms of lump abdomen or jaundice are usually indicative of advanced disease. USG can detect GBC but a CT scan is more helpful in characterizing the nature of lesion, LNs, and metastasis.

The propensity for nodal spread (N) becomes more as the T stage progresses. EC with intent for R0 resection in operable GBC is the mainstay of treatment. Post-operative intensive care is not required for majority of the patients. Most complications can be managed conservatively. However, regular follow-up of patients following surgery is necessary to detect and manage post-operative complications and to detect recurrence.

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