Greater Manchester and Cheshire HPB Unit
Guidelines for the Assessment & Management of Hepatobiliary and Pancreatic Disease
Chapter 9
9. **Management of Gallbladder Disease**

9.1. Gallbladder polyps

9.2. Laparoscopic Cholecystectomy

9.3. Patient readmitted post-laparoscopic cholecystectomy

9.4. Bile duct injury

9.5. Diagnosis and staging of gallbladder cancer

9.6. Treatment algorithm for Gallbladder Cancer

9.7. Management of incidentally detected gallbladder cancer

9.8. Extent of surgery for Gallbladder cancer

9.9. TNM classification and histopathology reporting proforma – Gallbladder cancer
9. Management of Gallbladder Disease
9.1. **Gallbladder polyps**

- **≤5mm**
  - GP Surveillance
  - 6 monthly for one year.
  - Then yearly for five years.
  - Manage according to size.

- **6 – 9 mm**
  - GP Surveillance or Refer for routine lap chole
  - Consider especially if: symptomatic age > 50 years PSC Indian ethnicity

- **10 – 20 mm**
  - Refer to local hospital for lap chole (TWO WEEK WAIT)

- **> 20 mm**
  - Refer directly to HPB Centre
  - Refer to HPB Centre if: suspicion of GB cancer GB cancer detected incidentally (see Guideline 9.5)
  - Manage as per suspected GB cancer. See Guidelines 9.3, 9.4
9.2. Laparoscopic Cholecystectomy

<table>
<thead>
<tr>
<th>Accepted indications</th>
<th>Timing of surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Symptomatic cholelithiasis</td>
<td>Routine elective</td>
</tr>
<tr>
<td>2. Biliary dyskinesia (symptoms plus gallbladder ejection fraction &lt;35%)</td>
<td>Early (&lt;7 days), same admission</td>
</tr>
<tr>
<td>3. Acute cholecystitis</td>
<td>Ideally same admission or planned procedure within 2 weeks</td>
</tr>
<tr>
<td></td>
<td>For severe acute pancreatitis: following full recovery</td>
</tr>
<tr>
<td>4. CBD stones, including acute pancreatitis</td>
<td>See: Guideline 9.1</td>
</tr>
<tr>
<td>5. Gallbladder polyps</td>
<td>Urgent elective</td>
</tr>
</tbody>
</table>

**Antibiotic prophylaxis:**
- First line regimen at induction: Co-amoxiclav 1.2g
- Alternative regimen: Gentamicin IV 5mg/kg (max 320mg) plus metronidazole IV 500mg

**VTE prophylaxis:**
- Start mechanical VTE prophylaxis at admission (anti-embolism stockings, intermittent pneumatic compression devices)
- Continue mechanical VTE prophylaxis until no significant reduced mobility
- Add pharmacological VTE prophylaxis if low risk of major bleeding (LMWH)
- See: Guideline 15.9
Technical considerations for laparoscopic cholecystectomy

- Open Hasson technique to obtain abdominal access.

- Completely expose and delineate Calot’s (cysto-hepatic) triangle to obtain the “critical view of safety” prior to dividing any structures. This involves identification of a single duct and a single artery entering the gallbladder and dissection of the lower part of the gallbladder off the liver bed. **Obtain photographic evidence.**

- Intraoperative cholangiography may reduce the rate or severity of bile duct injury.

- Record any intra-operative complications: bile spillage, stone spillage, bleeding, visceral injury, biliary injury.

- If required, CBD assessment may be performed either by intra-operative cholangiogram or laparoscopic ultrasound.

- Endoscopic bag use for retrieval of GB at the discretion of the operating surgeon.

- Drains are not routinely required, except in complicated cases.

- Conversion to open cholecystectomy is not a complication, but an attempt to avoid complications and ensure patient safety.

- **Know your results!** The Surgical Outcomes Club registry is available at: [http://app2.n3-dendrite.com/csp/lapchole/intellect/login.csp](http://app2.n3-dendrite.com/csp/lapchole/intellect/login.csp)

Management of choledocholithiasis – Accepted strategies

- Preoperative MRCP/EUS followed by ERCP, then laparoscopic cholecystectomy

- Laparoscopic cholecystectomy with intra-operative cholangiogram (IOC) or intra-operative ultra-sound (IOUS).
  
  ➢ Transcystic CBD exploration or choledochotomy
  
  ➢ Laparoscopic endo-biliary stent placement followed by ERCP
  
  ➢ Intra or postoperative ERCP
**Standardised operative details for laparoscopic cholecystectomy**

### Patient and operator data

<table>
<thead>
<tr>
<th>Date:</th>
<th>Patient details:</th>
<th>Surgeon:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaesthetist:</td>
<td>BMI □ &lt;18.5 □ 18.5 – 24.9 □ 25 – 29.9 □ 30 – 34.9 □ 35 – 39.9 □ &gt;40</td>
<td></td>
</tr>
</tbody>
</table>

- □ Antibiotic prophylaxis □ not given
- □ VTE prophylaxis □ not given

### Indications and timing

Surgery indicated for:
- □ Symptomatic cholelithiasis □ Biliary dyskinesia
- □ Acute cholecystitis □ CBD stones including acute pancreatitis
- □ Gall bladder polyps □ Porcelain GB or suspected malignancy

### Operative procedure

- □ Hasson technique for access □ other ________________________________
- □ Critical view of safety □ not achieved
- □ Photographic evidence of ‘Critical view of safety’ attached □ not performed
- □ Intraoperative complications
  - □ none □ bile spillage □ stone spillage
  - □ bleeding □ bowel injury □ bile duct injury
  - □ other ________________________________
- □ CBD assessment □ IOC □ IOUS □ not performed
- □ CBD exploration □ trans-cystic □ choledochotomy □ not performed
- □ Completed laparoscopically □ Converted to open
- □ other comments

### Postoperative instructions

- □ Oral analgesia □ Nurse led discharge □ surgical team led discharge
- □ No follow-up □ Follow-up ________________________________
- □ Other instructions

____________________________________________________________________________________

____________________________________________________________________________________
Patient readmitted post-laparoscopic cholecystectomy.

Management of the patient readmitted post-laparoscopic cholecystectomy:

1. **Abdominal pain, fever, failure to progress bile in drain**
2. **Clinical presentation**
3. **Initial investigations**
   - FBC, U/E, INR, CRP
4. **Ultrasound scan**
   - Anhepatic (collections), R/F, IJV, TDVT, prophylaxis
5. **Initial management**
   - Within 48h
   - MRCP
   - ERCP
6. **Fluid collection**
7. **USS report**
8. **Ethical**
9. **CT**
10. **Deltase collection or**
11. **Generalised peritonitis**
12. **Laparoscopic and washout**

Resolution:
- No
- Yes

Ultrasound-guided drainage:
- Localised
- Noted

Within 48h:
- ERCP
- MRCP
- USS

Laparoscopic + laparotomy
9.4. **Bile duct injury**

- Bile duct injury [BDI] represents a complex injury requiring a multidisciplinary, collaborative management among HPB surgeons, gastroenterologists and interventional radiologists. It is associated with significant perioperative morbidity and mortality, reduced long-term survival and quality of life and high rates of subsequent litigation.

- Early recognition, proper diagnosis of the level of BDI and associated vascular injury and early referral for a specialist management by an experienced HPB surgeon are paramount in preventing life-threatening complications of sepsis, biliary peritonitis, cholangitis, secondary biliary cirrhosis, portal hypertension and end-stage liver disease.

- Management depends on the timing of recognition of injury (intra-operative, early/within 6 weeks and delayed/after 6 weeks), level of BDI, associated vascular injuries and presence of sepsis.

- Definitive surgical management should be undertaken by a specialist HPB surgeon.

- Careful definition of the injury is important to evaluate the biliary tree using intra or post-operative cholangiogram studies and exclude vascular injuries. MR cholangiography is the most effective tool for visualising the biliary tree. Percutaneous or endoscopic cholangiography is mainly useful in patients with cholangitis providing anatomical information and therapeutic options.

- Patients with active sepsis and multi-organ failure are not candidates for surgical repair until they have resolved and patients have regained the anabolic state.

**Classifications of bile duct injuries**

Many classification systems of bile duct injury after laparoscopic cholecystectomy have been described; the Strasberg-Bismuth classification is the most comprehensive, most widely used and recommended.

**Bismuth classification of injuries (1982)**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type I</td>
<td>Bile duct injury or stricture, &gt;2cm from confluence</td>
</tr>
<tr>
<td>Type II</td>
<td>Bile duct injury or stricture, &lt;2cm from confluence</td>
</tr>
<tr>
<td>Type III</td>
<td>Hilar injury or stricture, but preserved confluence</td>
</tr>
<tr>
<td>Type IV</td>
<td>Hilar injury or stricture with loss of confluence</td>
</tr>
<tr>
<td></td>
<td>No communication between right and left ducts</td>
</tr>
<tr>
<td>Type V</td>
<td>Obstructed right posterior hepatic duct with or without CBD/CHD stricture</td>
</tr>
</tbody>
</table>
Strasberg-Bismuth classification of injuries (1995)

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type A</td>
<td>Bile leak from cystic duct of minor biliary radicle in gallbladder fossa</td>
</tr>
<tr>
<td>Type B</td>
<td>Occluded right posterior sectoral duct</td>
</tr>
<tr>
<td>Type C</td>
<td>Bile leak from divided right posterior sectoral duct</td>
</tr>
<tr>
<td>Type D</td>
<td>Bile leak from main bile duct without major tissue loss</td>
</tr>
<tr>
<td>Type E1</td>
<td>Transected main bile duct with a stricture &gt;2cm from confluence</td>
</tr>
<tr>
<td>Type E2</td>
<td>Transected main bile duct with a stricture &lt;2cm from confluence</td>
</tr>
<tr>
<td>Type E3</td>
<td>Hilar stricture, preserved confluence with the right and left ducts in communication</td>
</tr>
<tr>
<td>Type E4</td>
<td>Hilar stricture, loss of confluence with separation of ducts</td>
</tr>
<tr>
<td>Type E5</td>
<td>Stricture of the main bile duct and the right posterior sectoral duct</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Class</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I</td>
<td>Incision (incomplete transection) of the CBD; no tissue loss.</td>
</tr>
<tr>
<td>Class II</td>
<td>Lateral damage to the CHD; thermal injury or clips. Concomitant hepatic artery injury in 18%.</td>
</tr>
<tr>
<td>Class III</td>
<td>CHD transected; variable portion excised. Right hepatic artery injury in 27%. Type III a – remnant CHD Type III b – section at the level of confluence Type III c – loss of confluence Type III d – above confluence, section of secondary bile ducts</td>
</tr>
<tr>
<td>Class IV</td>
<td>Right and accessory right hepatic duct injuries with concomitant injury of the right hepatic artery in 60%.</td>
</tr>
</tbody>
</table>
**Key principles of management:**

- Early recognition directly affects outcome.
- Early referral to centre with expertise in biliary surgery may limit further operations, complications, time to definitive repair and mortality.
- Detailed and complete evaluation of the biliary tree and vascular injury improve outcome.
- The SNAP approach (adopted from the Intestinal Failure Unit at Salford Royal Infirmary) is applicable to the management of bile duct injury:
  - **Management of sepsis** – drainage of collections and control of biliary leak
  - **Nutritional support** – supplementation to address catabolic state in sepsis
  - **Definition of anatomy** – biliary tree and blood supply mapping
  - **Plan for definitive treatment** – planned after preceding criteria are met
- Endoscopic management is possible in the absence of complete circumferential interruption of the bile duct.
- Biliary reconstruction should be performed by a specialist using a Roux-en-Y hepatojejunostomy. It should provide a proximal, well vascularised, wide anastomosis without tension and complete biliary tree drainage.
Intra-operative diagnosis and management

- Three quarters of BDI are not recognised at the time of surgery. Intra-operative cholangiogram (IOC) can help identify up to 80% of BDI at the time of initial surgery compared to 45% when not used. This has implications for early diagnosis and intervention with improved outcomes. Early intra-operative detection decreases the technical difficulty of repair due to absence of infection, inflammation or presence of fibrotic tissue.

- If an HPB surgeon is not available, adequate drainage should be placed without converting to open procedure or further dissection and patient transferred to a tertiary unit. An attempt at repair or reconstruction should not be undertaken by the primary, non-specialist surgeon as success rates are poor.

- A detailed and complete intra-operative mapping of biliary tree will define the nature of injury, exclude specific forms of complication (right posterior sectoral duct injury) and inform definitive management.

- The presence of a Luschka’s duct (direct communication between the right hepatic ductal system and the GB through the GB bed) is the second most frequent cause of post-operative leaks after cystic duct leak.

- Intra-operative leaks are usually due to misidentification of the bile duct, whereas delayed leaks diagnosed in the postoperative period are a result of thermal/vascular injury during dissection.

- An incisional injury without tissue loss or a partial defect can be managed with repair using a fine absorbable suture and sub-hepatic drainage. Postoperative leaks can be managed endoscopically.

Criteria for primary repair/reconstruction:

- Complete biliary tree mapping and drainage
- Vascular flow intact and bile duct healthy, with no thermal burns or necrotic tissue
- Absence of sepsis
- Well vascularised, wide, tension free anastomosis
Intra-operative diagnosis of bile duct injury

Intra-operative cholangiogram

- Right posterior duct injury (Class B and C)
  - Small segment drainage - Ligation
    - Yes - ligation or hepatic resection
    - No - Roux-en-Y reconstruction or hepatic resection
  - Vascular assessment

- Partial injury, no loss of continuity (Class D)
  - Large segment drainage
    - Absorbable monofilament sutures
      - Yes - Roux-en-Y reconstruction or hepatic resection
      - No - Delayed reconstruction

- Complete transsection, loss of continuity (Class E)
  - Meets criteria for primary reconstruction
    - Proximal, wide Roux-en-Y bilio-enteric anastomosis
    - Yes - delayed reconstruction
Post-operative diagnosis and management

- Drains in laparoscopic cholecystectomy [LC] are not routine due to increased risk of infection and longer hospital stay, therefore symptoms of abdominal pain with or without peritonitis, N&V and sepsis should prompt investigations to exclude presence of bile in the abdomen (BDI).

- A readmission after laparoscopic cholecystectomy is a bile duct injury until proven otherwise. See: Protocol following readmission after laparoscopic cholecystectomy

- After LC the incidence of collections in the GB is 10-14%, but the presence of fluid outside the GB fossa should not be dismissed as normal post-operative finding. Detection of fluid warrants US-guided aspiration and if bile is detected, requires a high quality cholangiogram to define BDI and concomitant vascular injury (MRCP/MRA is the most effective tool).

- In presence of sepsis, control by percutaneous drainage of abscess or collection and percutaneous/endoscopic management of the on-going bile leak is the primary goal of the initial management of a BDI. A definitive surgical procedure can be undertaken after 4-6 weeks when the associated inflammation has subsided.

- Vascular injury is present in 26-32% of cases of BDI and assessment of vascular anatomy is required by MRA or CTA. A vascular injury has to be suspected when there is a bleeding accident during LC, sudden postoperative rise in ALT and excessive, multiple clips on imaging. Arterial and porto-venous studies must be carried out to evaluate vascular injury and exclude pseudoaneurysms in presence of sepsis.

- 90% of patients with incomplete bile duct injuries have effective endoscopic (endoprosthesis) management without sphincterotomy as it is associated with pancreatitis, bleeding and long-term risk of strictures in the young patients.

- Bilioenteric anastomosis when necessary is performed as proximally as possible to provide wide and well vascularised anastomosis in absence of infection using absorbable sutures, single-layer anastomosis and debridement back to healthy non-inflamed or scarred tissue to achieve success.

- If the criteria for successful anastomosis cannot be met in the event of disruption of the confluence, associated vascular injury, significant diathermy injury, surrounding sepsis, it may be prudent to delay repair and establish a controlled fistula. This will demarcate the final level of injury, can determine the need for hepatic resection and allow the ducts to dilate and mature to improve the chance of success.
Delayed diagnosis and management

- Sepsis is managed in a staged SNAP approach. First stage combining endoscopic and intervention radiological measures to obtain drainage of collection and a controlled entero-cutaneous fistula allowing local inflammatory changes to subside in 4-6 weeks time.

- Definitive management of major BDI in a delayed setting requires attention to sepsis and nutrition and a delay for 3 months to allow the patient to be in an anabolic state, inflammation to settle and tissues to mature.

- Endoscopic management of strictures with balloon dilation and stenting is likely to fail if performed before 4 months. Recurrent cholangitis beyond this should be addressed surgically.

- Without adequate management, secondary biliary cirrhosis and portal hypertension can result, leading to increased mortality after BDI.
9.5. Diagnosis and staging of gallbladder cancer

**Clinical Presentation**
RUQ pain, weight loss, anaemia and nausea.
RUQ mass and biliary obstruction with advanced disease.

**Blood Tests**
Include: FBC, U+E, LFTs, INR, CRP, CEA, CA 19-9

**Imaging**
- USS
- Contrast Enhanced CT (CECT) and/or MRI

**MDT**
For full staging

SEE ALSO
Management of incidental GB cancer detected after cholecystectomy
9.6. Treatment algorithm for Gallbladder Cancer

MDT
For full staging

Potentially Operable
T1, T2, (T3)
N1

Cardiopulmonary Exercise Testing (CPET)

FIT TO PROCEED

STAGING LAPAROSCOPY

INOPERABLE

SURGERY

See Table 1:
Extent of surgery

ADJUVANT CHEMOTHERAPY
Clinical Trials

Inoperable
T3, T4
M

CHEMOTHERAPY
Clinical Trials

UNFIT TO PROCEED
9.7. **Management of incidentally detected gallbladder cancer**

Incidental gallbladder cancer diagnosed on Pathology Report

**MDT**
Full review of pathology specimen and operation note

**Imaging**
CT chest, abdomen and pelvis

**Surgery**
- **pTis or pT1a**
  Simple cholecystectomy usually curative
- **pT1b**
  (invades the muscularis propria)
  Consider re-exploration and radical resection
- **pT2**
  (penetrates the muscularis propria)
  Re-exploration and radical resection
  See Extent of Surgery for Gallbladder Cancer

**Intra-Operatively Detected**
Suspect in older patients, when a thick-walled gallbladder is encountered, or when the tissue planes are obscured.

**HPB UNIT**
- Convert to Radical Cancer Surgery

**MANCHESTER CANCER NETWORK**
- Terminate the procedure and refer the HPB Unit
### 9.8. Extent of surgery for Gallbladder cancer

<table>
<thead>
<tr>
<th>pTis or pT1a</th>
<th>Gallbladder Resection</th>
<th>Liver Resection</th>
<th>Extra-hepatic Bile Duct Resection</th>
<th>Portal Lymphadenectomy</th>
<th>Port Site Resection</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES Simple cholecystectomy usually curative</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>pT1b</td>
<td>YES</td>
<td>YES</td>
<td>Extended cholecystectomy (en-bloc 2cm of adjacent liver)</td>
<td>YES</td>
<td>Consider if bile spillage during original cholecystectomy</td>
</tr>
<tr>
<td>T2</td>
<td>YES</td>
<td>YES</td>
<td>Extended cholecystectomy if minimal liver invasion or Segmentectomies (IVB and V) if tumour of the GB fundus or Extended right hepatectomy for tumours of body and neck of GB +/- Segment I</td>
<td>YES</td>
<td>Consider if bile spillage during original cholecystectomy</td>
</tr>
<tr>
<td>T3</td>
<td>YES</td>
<td>YES</td>
<td>Extended right hepatectomy +/- Segment I</td>
<td>YES</td>
<td>Consider if bile spillage during original cholecystectomy</td>
</tr>
<tr>
<td>T4</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO Unresectable</td>
</tr>
<tr>
<td></td>
<td>Unresectable</td>
<td>Unresectable</td>
<td>Unresectable</td>
<td>Unresectable</td>
<td>Unresectable</td>
</tr>
</tbody>
</table>
9.9. **TNM classification and histopathology reporting proforma – Gallbladder cancer**

**TNM classification**

**T - Primary**

- **pT0**  No evidence of primary tumour
- **pTis**  Carcinoma *in situ*
- **pT1a**  Tumour invades lamina propria
- **pT1b**  Tumour invades muscular layer
- **pT2**  Tumour invades perimuscular connective tissue; no invasion beyond serosa or into liver
- **pT3**  Tumour perforates the serosa (visceral peritoneum) and/or directly invades the liver and/or one other adjacent organ or structure, such as: the stomach, duodenum, colon, pancreas, omentum or extrahepatic bile ducts
- **pT4**  Tumour invades main portal vein or hepatic artery; or invades two or more extrahepatic organs or structures.

**N – Regional lymph nodes – all tumour sites**

- **pNx**  Regional lymph nodes cannot be assessed
- **pN0**  No regional lymph node metastases. Histological examination of a regional lymphadenectomy specimen will ordinarily include three or more lymph nodes for HCC, ICC and gall bladder cancer, and 15 lymph nodes for perihilar CC. If the lymph nodes are negative, but the number ordinarily examined is not met, classify as pN0
- **pN1**  Regional lymph node metastasis.

**M – Distant metastasis**

- **pM1**  Distant metastasis. This includes metastasis to non-regional lymph nodes, including: periaortic, pericaval, superior mesenteric artery and/or coeliac artery lymph nodes (The only pM code that can be assigned by the pathologist is pM1 – it is not possible to ascertain the absence of distant metastases).

**Stage grouping for gall bladder carcinoma**

- **Stage 0**  Tis N0 M0
- **Stage IA**  T1 N0 M0
- **Stage IIA**  T2 N0 M0
- **Stage IIIA**  T3 N0 M0
- **Stage IIIB**  T1, T2 or T3 N1 M0
- **Stage IVA**  T4 Any N M0
- **Stage IVB**  Any T Any N M1
**Histopathology reporting proforma – Gallbladder cancer**

Surname: ..................................  Forenames: ..................................  Date of birth: ..................................

Sex: ..................................  CHI/NHS no: ..................................  Hospital: ..................................

Hospital no: ..................................  Date of receipt: ..................................  Date of reporting: ..................................


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### Gross description

**Type of specimen:**  Cholecystectomy (cancer not previously suspected) □

- *En bloc* gall bladder and liver □  List liver segments resected: ……………………
- Staged liver resection □  List liver segments resected: ……………………

- Previous gall bladder report reviewed □  Slides reviewed □  pT stage …………………

### Gall bladder

**Dimensions:**  Length:……..  Width:…………..  Maximum wall thickness:………………

**Mucosal aspect of tumour:**  Papillary/exophytic □  Plaque/infiltrative □

**Location of tumour:**  Peritoneal side □  Hepatic side □  Both or not assessable □

**Maximum dimension of tumour ………….mm**

**Gall stones present?**  Yes □  No □

**Length of cystic duct ……..mm**  Other bile ducts resected? Yes □  No □

### Liver resections:

**Specimen weight………………………g**

**Specimen dimensions:**  Antero-posterior …..mm  Medio-lateral …..mm  Supero-inferior……..mm

**Direct invasion of liver**  Yes □  No □

- If yes: depth of liver invasion ……..mm  Distance from nearest hepatic resection margin ………………..mm

**Hepatic metastases present**  Yes □  No □

**Invasion of adherent or adjacent organ**  Yes □  No □  If yes, which organ ………………………

**Lymph node(s) received**  Yes □  No □  Includes non-regional nodes? Yes □  No □
Histology

**Tumour grade/differentiation (adenocarcinoma):** Other histological type (specify)…………………….

- Well □
- Moderate □
- Poor □

**Depth of invasion**

- Lamina propria (pT1a) □
- Muscular layer (pT1b) □
- Beyond muscle (pT2) □
- Perforates serosa (pT3) □
- Invades liver (pT3) □
- Invades other organs Yes □ No □ If yes, which……………………………………

- Cystic duct: Involved □
- Dysplasia/BilIN □
- No dysplasia/BilIN □

- Other ducts resected Yes □ No □ If yes: involved by dysplasia/BilIN: Yes □ No □

- Tumour cells present at any resection margin: Yes □ No □
- If margin is clear: is clearance >10 mm: Yes □ No □
- If no: minimum distance to margin .................mm
- Microscopic vascular invasion identified: Yes □ No □
- Perineural invasion identified: Yes □ No □

- Number of lymph nodes examined: ............. Number with metastases: ...........

**Comments/additional information**

Pathological staging: gall bladder carcinoma pT........ pN........

- PTis Carcinoma in situ pN0 no lymph node metastases
- pT1a Tumour invades lamina propria pN1 regional lymph node metastases
- pT1b Tumour invades muscular layer (Record non-regional lymph node metastases as pM1)
- pT2 Tumour invades perifibromuscular connective tissue
- pT3 Tumour perforates serosa/invades liver/one other organ
- pT4 Tumour invades ≥2 extrahepatic organs or main portal vein/hepatic artery

**Signature of pathologist** ................................. Date .../.../……..

**SNOMED codes**   pT ..... M ......