

Specimen(s) submitted (Core)

In assessing macroscopic specimens which contain malignant epithelial tumours of the liver it is important to establish the nature of the surgical resection.¹ Liver tumours are resected either by segmental resection² following the planes of whole liver segments defined by intra-operative ultrasound, or non-anatomical (wedge) resection for small, accessible, subcapsular lesions. The dataset should also be applied to total hepatectomy specimens from patients undergoing liver transplantation when tumour is present.

The segmental anatomy of the liver is shown in Figure 1. The boundaries of the eight segments represent the watershed between portions of liver perfused by main branches of the hepatic artery and portal vein, and form the basis of the various surgical options for major liver resection.

Segmentectomy procedures result in sizeable resection specimens. The surgeon should state which segments are included as this may not be clear from the topography of the specimen. The boundary of segments is defined by the course of intrahepatic vessels and cannot be inferred from surface landmarks. Wherever possible, the preoperative imaging report should be available to the pathologist at the time of specimen dissection.

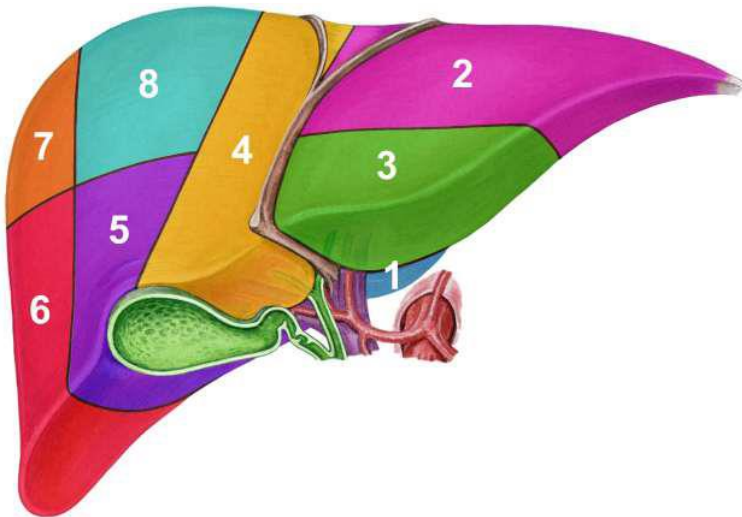


Figure 1: Segmentectomy and hepatectomy specimens. Reproduced with permission from The Royal College of Pathologists (2012). *Dataset for histopathology reporting of liver resection specimens (including gall bladder) and liver biopsies for primary and metastatic carcinoma, 2nd edition.* The Royal College of Pathologists.³

Right hepatectomy segments 5–8

Right trisectionectomy (extended right hepatectomy) segments 4–8

Left lateral sectionectomy segments 2–3

Left hepatectomy segments 2–4

Left trisectionectomy (extended left hepatectomy) segments 1–5 and 8

Total hepatectomy segments 1–8

Surgical intervention for cholangiocarcinomas arising at the hilum (i.e., proximal to the junction of the cystic and common hepatic duct) will generally include a length of extrahepatic duct in continuity with segments or lobes of liver. There is considerable anatomical variability at the liver hilum, and the pathologist should consult the surgeon if the identity of the main hilar vessels and ducts is not clear from the information provided on the request form. Specimens may include lymph nodes, either dissected separately by the surgeon or found at the liver hilum in the resected specimen. A

regional lymphadenectomy specimen will ordinarily include six or more lymph nodes for primary intrahepatic and gallbladder cancers, and 15 lymph nodes for perihilar cholangiocarcinomas (CC).⁴ Regional lymph nodes (portal nodes) are those in the hepaticoduodenal ligament: hilar, cystic duct, pericholedochal, hepatic artery, portal vein for perihilar CC. More distant nodes (extra-portal nodes) are occasionally resected and involvement of such nodes is classified as distant metastasis (M1). There is no pN2 category for intrahepatic cholangiocarcinoma, but because the number of positive lymph nodes correlates with survival, pN2 has been added in the 8th edition of the TNM classification for cases of perihilar CC with four or more nodal metastases.^{4,5}

Block identification key

The origin/designation of all tissue blocks is essential information and particularly important should the need for internal or external review arise. The reviewer needs to be clear about the origin of each block in order to provide an informed specialist opinion. Imaging documentation of macroscopic specimens, ideally with annotation, is recommended for resection specimens and can aid microscopic-macroscopic correlation. It may facilitate an understanding of the origin of specimens and aids with review of the case at a later date, as well as providing useful information for multidisciplinary meetings.

Recording the origin/designation of tissue blocks also facilitates retrieval of blocks, for example for further immunohistochemical (IHC) or molecular analysis, research studies or clinical trials.

Because of the importance of resection margin status, it is recommended that all surgical surfaces (hepatic transection plane and hilar tissues for perihilar cholangiocarcinoma) are painted prior to specimen dissection and recorded in the block key.

The precise blocks will vary according to specimen and tumour type.⁶⁻⁹ The number of blocks is influenced by tumour type. For hepatocellular carcinoma (HCC), it is recommended that a minimum of three tumour blocks be examined and all macroscopically distinctive areas should be sampled. When previous therapy has been administered microscopic examination of the entire tumour should be done when feasible. For selective sampling, sampling an entire cross section has been recommended if the tumour is ≤ 2 centimetres (cm) with an additional section for each 1 cm for larger tumours.¹⁰ Additional sampling of areas that appear grossly viable is often necessary.

The following guidelines are provided for intrahepatic tumours:

- Tumour with nearest hepatic resection margin (when this is close enough to the tumour to be included in the block).
- Other blocks of tumour with adjacent liver tissue (for microscopic vascular invasion (MiVI)).
- Liver capsule if there is a possibility of capsular invasion, i.e., where there is subjacent tumour and overlying adherent tissue or macroscopic capsular invasion. Where the capsule appears intact over subcapsular tumour, with a smooth shiny surface, histology is not required to confirm capsular integrity.
- Gallbladder bed and wall where there is adjacent intrahepatic tumour.
- Any site macroscopically suggestive of macrovascular or bile duct invasion.
- Background liver (taken as far away as possible from the tumour).

A block of representative background liver should be taken at a distance from the tumour, whether or not it looks abnormal macroscopically.

For perihilar cholangiocarcinoma, careful dissection and block taking from the biliary tree is necessary to delineate the extent and margin status. The distal margin of the biliary tree and the

proximal margin of the left or right duct(s) should be identified prior to dissection. This is aided if the surgeon identifies and marks the structures, e.g., with a coloured tie(s). The resection margins of these ducts may be submitted separately by the surgeon, with or without a request for frozen section.

References

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