SURGICAL ANATOMY AND PHYSIOLOGY

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The gallbladder is a pear-shaped structure, 7.5–12 /uni00A0 cm long, with a normal capacity of about 25–30 /uni00A0 mL. Its anatomical divisions are fundus, body and neck, which terminates in a narrow infundibulum. The gallbladder lies on the underside of the liver in the main liver scissura at the junction of the right and left lobes. Its relationship to the liver varies from being embedded within the liver substance to being suspended by a mesentery . The muscle fibres in the wall of the gallbladder are arranged in a criss-cross manner, being particularly well devel oped in its neck. The mucous membrane contains indentations (crypts of Luschka) that sink into the muscle coat. The cystic duct is about 3 /uni00A0 cm in length, but this is variable. Its lumen is 1–3 /uni00A0 mm in diameter; its mucosa is arranged in spiral folds (valv es of Heister); and the wall is surrounded by the sphincter of Lütkens. The cystic duct joins the supraduodenal segment of the common hepatic duct in 80% of cases; ho wever, the junction may be much lower in the retroduodenal or even retropancreatic part of the bile duct. Occasionally , the cystic duct may join the right hepatic duct or even a right hepatic sectorial duct (see Low insertion of the cystic duct). The common hepatic duct is usually less than 2.5 /uni00A0 cm long and is formed by the union of the right and left hepatic ducts. The common bile duct (CBD) is about 7.5 /uni00A0 cm long and is formed by the junction of the cystic and common hepatic ducts. It is divided into four parts: Hubert Luschka , 1820–1875, Professor of Anatomy , Tübingen, Germany . Lorenz Heister , 1683–1758, Professor of Surgery and Botany , Helmstädt, Germany . Ulrich Lütkens , b. 1894, surgeon, University Clinic, Berlin, Germany , published a monograph on the structure and function of the extrahepatic biliary tract in 1926. Ruggero Oddi , 1845–1906, physiologist, Perugia, Italy . Abraham Vater , 1684–1751, Professor of Anatomy and Botany , Wittenberg, Germany . Jean François Calot , 1861–1944, surgeon, Paris, France. 1 supraduodenal portion, about 2.5 /uni00A0 cm long, runs in the free edge of the lesser omentum; 2 retroduodenal portion; 3 infraduodenal portion, lies in a groove, at times in a tunnel, on the posterior surface of the pancreas; 4 intraduodenal portion, passes obliquely through the wall of the second part of the duodenum, where it is surrounded by the sphincter of Oddi and terminates by opening on the summit of the ampulla of Vater. The cystic artery , a branch of the right hepatic artery , usually arises behind the common hepatic duct (Figure 71.1). Occasionally , an accessory cystic artery arises from the g astro - - duodenal artery . In 15% of cases the right hepatic artery and/ or cystic artery cross in front of the common hepatic duct and cystic duct. Calot’s triangle, or the hepatobiliary triangle, was initially described by Calot as the space bordered b y the cystic duct inferiorly , the common hepatic duct medially and the superior border of the cystic artery . This has been modified in contemporary literature as the area bound superior ly by the inferior surface of the liver, later - ally by the cystic duct and the medial border of the gallbladder and medially by the common hepatic duct (‘hepatocystic trian - gle’). It is an important surgical landmark as the cystic arter y usually can be found within its boundaries (Figure

71.2a). The cystic lymph node often lies superficial to the cystic artery and acts as a landmark to locate this artery in di ffi cult cases. The cystic plate is a flat ovoid fibrous sheet contin uous with the liver capsule of segments IV (medially) and V

To be aware of unusual disorders of the biliary tree • To be aware of malignant disease of the gallbladder and •

(laterally). It is located in the gallbladder bed and needs to be exposed to achieve the critical view of safety (CVS) during cholecystectomy . Rouvière’s sulcus on the undersurface of the right lobe of the liver running to the right of the hepatic hilum marks the position of the right posterior sectoral pedicle. The advantage of identifying Rouvière’s sulcus and the line joining M. Henri Rouvière , 1876–1952, Professor of Anatomy , LeBleymard, France. Berkeley George Andrew Moynihan (Lord Moynihan), 1865–1936, Professor of Clinical Surgery , Leeds, UK. (Rouvière’s sulcus /uni2192 segment IV /uni2192 umbilical fissure) is that the cystic duct and the cystic artery lie ventral (anterosuperior) to the line and the CBD lies below the line. CBD injury can be minimised b y maintaining the dissection ventral to the line during cholecystectomy . In the case of di ffi culty , all dissection during laparoscopic cholecystectomy should be performed ventral to the R4U line (Figure 71.3).

artery artery Hepatic artery Left choledochal artery Common hepatic artery Cystic artery Retroduodenal artery Right choledochal artery Gast ro duodenal artery Figure 71.1 Anatomy of the gallbladder and bile ducts. Note the arrangement of the arterial tree. (a) (b) Figure 71.2 (a) The usual anatomy of the ‘hepatocystic triangle’; short cystic artery. (b) and (c) are examples of the ‘caterpillar turn’ or ‘Moynihan’s hump’, which can lead to inadvertent arterial injury or bleeding during cholecystectomy.

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