Minimally invasive adrenalectomy

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Transperitoneal laparoscopic adrenalectomy Familiarity with the anatomy of the adrenal region is essential and it should be noted that the approaches for the right and left sides are distinct. Careful haemostasis is essential as small amounts of blood impair the view; direct grasping of the adrenal tissue/tumour should be avoided to reduce the risk of capsular rupture. Right transperitoneal laparoscopic adrenalectomy The patient is positioned right side up, with table break. Four ports are used. The liver is retracted cranially and the perito neal fold between the liver and the tumour is divided from the lateral border of the IVC to the right triangular ligament with the preferred energy device. The peritoneum is then opened caudally along the lateral border of the IVC to the upper renal pole. This allows the tumour to be retracted laterally; the space between it and the IVC is developed, in the process exposing the short right adrenal vein. At this point the posterior abdominal wall (quadratus lumborum) is visible. The vein is clipped and divided and the inferior and lateral attachments are divided and the tumour is removed in a tissue retrieval bag. Left transperitoneal laparoscopic adrenalectomy The patient is positioned left side up, with table break. Three ports are used. In the initial phase, the aim is to perform a limited medial visceral rotation of the splenic flexure of the colon, spleen and pancreatic tail. This is achieved by dividing the lateral peritoneal attachments of the colon and the anterior layer of the lienorenal ligament cranially , a distance of 1 /uni00A0 cm from the spleen, until the gastric fundus is visible. Further dissection and gravity allow the spleen and pancreatic tail to ‘fall’ medially to expose the kidney/perinephric fat, covered in Gerota’s fascia. The fascia is opened to allow identification of the adrenal vein as it drains into the left renal vein. Once the vein has been clipped and divided, the tumour is retracted away from the renal hilum and resection is completed by mobilising the adrenal gland along its superior, inferior and lateral borders. The inferior phrenic tributary of the adrenal vein may be encountered and is dealt with by clipping. The tumour is then placed in a tissue retrieval bag for removal. Posterior retroperitoneoscopic adrenalectomy This technique may be favoured when there has been extensive upper abdominal surgery or for reoperative adrenalectomy (being outside the abdominal cavity a ff ords a better view) as The Mercedes-Benz sign takes its name from the insignia displayed on the bonnet of a Mercedes-Benz car. well as for bilateral adrenalectomy . It may not be feasible with larger tumours (>5–6 /uni00A0 cm) and in the very obese patient (body mass index >40). The patient is placed prone with the hips and - knees flexed to abolish the lumbar lordosis. The first port is placed at the distal end of the 12th rib with a combination of scissor and digital dissection into the retroperitoneum. Gerota’s fascia is swept o ff the posterior abdominal wall and space is made for insertion of the medial (10 /uni00A0 mm) and lateral (5 /uni00A0 mm) ports, which are inserted with finger guidance. A balloon insu ffl ated port is then inserted into the initial port and CO 2 to 20–25 /uni00A0 mmHg; a 30° endoscope is used.

Gerota’s fascia is opened, avoiding a peritoneal rent laterally . Dissection contin - ues through the perirenal fat to the superior renal pole. The tumour is then mobilised along its lateral and medial borders. The medial border of a right-sided tumour is dissected o ff the IVC to expose the right adrenal vein, which can then be ligated and divided (Figure 57.13). On the left side, the adrenal vein is located at the medial inferior pole of the adrenal gland. After venous ligation, the superior attachments are divided to excise the tumour. The inflation pressure is then reduced to check for haemostasis before tumour extraction with a tissue retrieval bag. Open adrenalectomy This operation should be performed when a malignant adrenal tumour is suspected, or for very large tumours (>8–10 /uni00A0 cm). In the case of adrenocortical cancer, the aim is to remove the tumour in continuity with any invaded adjacent organs en bloc and obtain negative resection margins (R0). Consequently , if there is a risk or intention to perform nephrectomy , splenectomy , distal pancreatectomy or limited right hemihepatectomy , the patient should be consented (and, in the case of splenectomy , vaccinated) accordingly . Similarly , a multidisciplinary approach should be employed for tumours that are invading the liver or IVC. Surgical access is via a rooftop incision extending to the appropriate flank, with Mercedes-Benz extension if necessary . On the right, the hepatic flexure of the colon is mobilised, the

Figure 57.13 View of the right adrenal vein draining (arrow) into the inferior vena cava (IVC) during posterior retroperitoneoscopic adrenal

ectomy (courtesy of Fausto Palazzo, Hammersmith Hospital, London, UK). AT, adrenal tumour.

duodenum Kocherised and, if the tumour extends cranially , the right liver lobe is mobilised to achieve optimal exposure of the IVC and tumour. Dissection is from lateral to medial and then along the lateral border of the IVC, inferior to and includ ing the kidney if that is involved. On the left side the adrenal gland can be exposed after mobilisation of the splenic flexure of the colon. If invasion of the pancreas is suspected, distal pancreatectomy is performed with or without splenectom not, they are medially rotated as for the transperitoneal laparo scopic operation. The retroperitoneum is then dissected lateral to medial, including the kidney if necessary , and then along the lateral border of the left crura and cranially towards the diaphragm. If pancreatectom y is performed, a drain should be left to manage a potential pancreatic fistula.

Tumour (syndrome) Incidence (%) Presentation Insulinoma 70–80 Weakness, sweating, tremor, tachycardia, anxiety, fatigue, dizziness, disorientation, seizures Gastrinoma 20–25 Intractable or

recurrent peptic ulcer disease (haemorrhage, perforation), complications of peptic ulcer, diarrhoea Non-functional tumours 30–50 Obstructive jaundice, pancreatitis, epigastric pain, duodenal obstruction, weight loss, fatigue VIPoma 4 Profuse watery diarrhoea, hypotension, abdominal pain Glucagonoma 4 Migratory necrolytic skin rash, glossitis, stomatitis, angular cheilitis, diabetes, severe weight loss, diarrhoea Somatostatinoma <5 Cholelithiasis, diarrhoea, neuro /f_i bromatosis Carcinoid <1 Flushing, sweating, diarrhoea, oedema ACTHoma <1 Cushing’ GRFoma <1 Acromegaly ACTH, adrenocorticotropic hormone; GRH, growth hormone-r

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