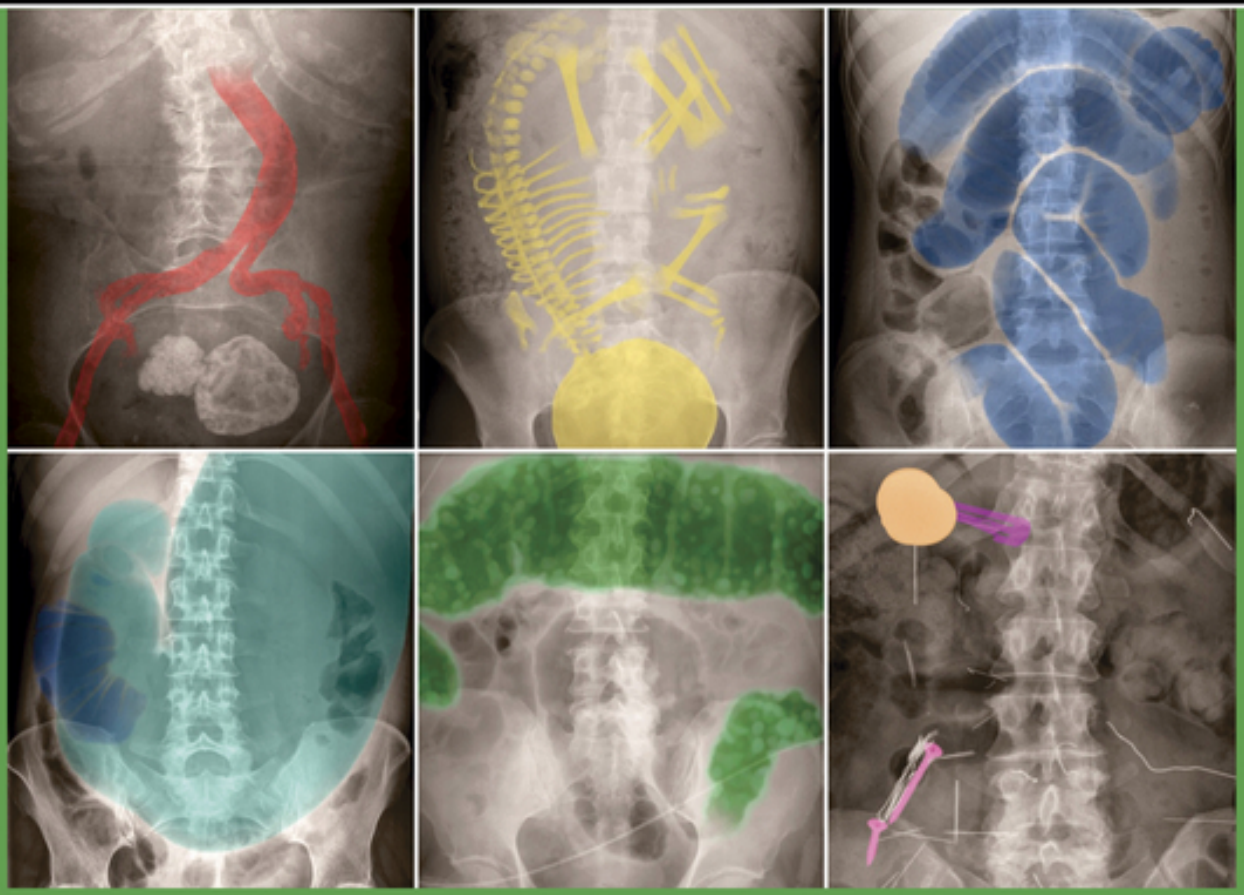
ABDOMINAL X-RAYS
FOR MEDICAL STUDENTS



CHRISTOPHER CLARKE & ANTHONY DUX

with self-test

WILEY Blackwell

CONTENTS

List of Illustrations

easily. The position of the liver edge is shown by the white arrows.

Figure 21: Diagrammatic representation of the falciform ligament sign. When free gas is present in the peritoneal cavity and the patient is lying supine, the falciform ligament becomes visible in the right upper quadrant as an opaque line extending inferiorly from the liver. This line appears in the position as shown by the white arrows.

Figure 22: A CT slice through the abdomen showing a pneumoperitoneum. The gas is marked with an arrow.

Figure 23: Two identical abdominal radiographs showing a pneumoperitoneum. There are loops of bowel with gas outlining both sides of the bowel wall in keeping with Rigler's sign. The right radiograph shows in turquoise and brown the areas where Rigler's sign is most clearly seen. The lumen of the bowel is marked in brown and the free gas outlining the bowel wall marked in turquoise. The best example of Rigler's sign is marked with a white circle. An area of normal appearing bowel wall is marked with a white dashed circle for comparison. (You can also see dilated loops of large bowel.)

Figure 24: Two identical abdominal radiographs showing a large pneumoperitoneum. There are loops of bowel with gas outlining both sides of the bowel wall in keeping with Rigler's sign. The right radiograph shows in turquoise the areas where the pneumoperitoneum is most clearly seen. Where Rigler's sign is most clearly seen, the lumen of the bowel is marked in brown. The best example of Rigler's sign is marked with a white circle. You can also see gas outlining the liver as shown by the white line.

Figure 25: Two identical abdominal radiographs showing a pneumoperitoneum. There is a dilated loop of bowel with gas outlining both sides of the bowel wall in keeping with Rigler's sign. The right radiograph shows in turquoise and brown the areas where Rigler's sign is most clearly seen. The lumen of the bowel is marked in brown and the free gas outlining the bowel wall marked in turquoise. The best example of Rigler's sign is marked with a white circle.

Figure 26: Two identical abdominal radiographs of a young child showing a pneumoperitoneum. There are loops of bowel with gas outlining both sides of the bowel wall in keeping with Rigler's sign, and there is gas outlining the falciform ligament in keeping with the falciform ligament sign. The right radiograph shows in turquoise and brown the areas where Rigler's sign is most clearly seen. The lumen of the bowel is marked in brown and the free gas outlining the bowel wall marked in turquoise. The position of the falciform ligament is shown with white arrows. The best example of Rigler's sign is marked with a white circle. (You can also see dilated loops of bowel.)

Figure 27: Two identical abdominal radiographs of the upper abdomen showing a pneumoperitoneum. There is gas outlining the falciform ligament in keeping with the falciform ligament sign and there is also gas outlining the liver. The right radiograph shows in turquoise the areas where the pneumoperitoneum is most clearly seen. The position of the falciform ligament is shown with white arrows and the outline of the liver edge is shown by the white lines.

Figure 28: Two identical abdominal radiographs taken in the left lateral decubitus position showing a large pneumoperitoneum. The patient is lying on their left side. You can see the bony pelvis on the left of the image, and the dark area on the top right of the image is the base of the patient's right lung. There are loops of bowel with gas outlining both sides of the bowel wall in keeping with Rigler's sign and there is also gas outlining the liver. The right radiograph shows in turquoise the areas where the pneumoperitoneum is most clearly seen. Where Rigler's sign is most clearly seen, the lumen of the bowel is marked in brown. The best example of Rigler's sign is marked with a white circle. You can also see gas outlining the liver as shown by the white line. The right lung is marked in blue.

Figure 29: Diagrammatic representation of the appearance of retroperitoneal gas outlining the kidneys. When gas is present in the retroperitoneal space the kidney edges are seen much more easily. The position of the kidney edges are shown by the white arrows.

Figure 30: Two identical abdominal radiographs showing gas in the retroperitoneal space. There are patchy areas of blackness (gas) seen outlining both kidneys either side of the spine. The right radiograph shows the retroperitoneal gas marked in turquoise, clearly outlining both kidneys.

Figure 31: Two identical abdominal radiographs of the upper abdomen showing gas in the retroperitoneal space. There are patchy areas of blackness (gas) seen outlining both kidneys either side of the spine. The right radiograph shows the

retroperitoneal gas marked in turquoise, clearly outlining both kidneys.

Figure 32: Diagrammatic representation of the appearance of gas in the biliary tree on a plain abdominal radiograph. The gas appears as a linear branching pattern (like a tree) and is seen in the centre of the liver, becoming more prominent towards the hilum.

Figure 33: Two identical abdominal radiographs of the upper abdomen showing gas within the biliary tree. There are branching dark lines (gas) projected over the centre of the liver, larger and more prominent towards the hilum. There is also a biliary stent projected over the midline (arrows). This is situated within the common bile duct and explains why gas is easily able to travel from the duodenum into the biliary system. The presence of pneumobilia indicates that the stent is probably patent. The right radiograph shows the gas within the biliary tree marked in dark blue.

Figure 34: Diagrammatic representation of the appearance of portal venous gas on a plain abdominal radiograph. The gas appears as a linear branching pattern in the periphery of the liver (**1**). This is because the portal venous blood flows from the portal vein towards the periphery of the liver. If there is a large amount of gas in the portal vein, then it may be seen extending from the periphery to the centre of the liver and even within the splenic vein (**2**).

Figure 35: Two identical abdominal radiographs of a child showing gas in the portal venous system. There are branching dark lines (gas) projected over the periphery of the liver. In this case the gas is so extensive that it is also seen in splenic vein. The right

radiograph shows the gas within the portal venous system marked in dark blue. Gas in the splenic vein is marked in light blue. (You can also see dilated loops of large bowel.)

Chapter 09

Figure 36: Causes of mechanical small bowel obstruction.

Figure 37: Two identical images showing a loop of dilated small bowel with the classical radiographic appearances of valvulae conniventes crossing the entire width of the bowel. The right image shows the valvulae conniventes highlighted in white.

Figure 38: Two identical abdominal radiographs showing dilated small bowel. The bowel is visible as there is gas (black) within. You can tell that it is small bowel as it is centrally located and valvulae conniventes can be seen throughout. The loops measure >3 cm in diameter therefore they are dilated. The right radiograph shows the dilated small bowel marked in blue.

Figure 39: Two identical abdominal radiographs showing a loop of dilated small bowel. The loop of bowel is visible as there is gas (black) within. You can tell that it is small bowel as valvulae conniventes can be seen throughout. The loop measures >3 cm in diameter and is therefore dilated. When a single dilated loop is seen (as in this case) it is known as a **sentinel loop**. It is a feature that is occasionally due to a localised ileus from nearby inflammation causing local paralysis and accumulation of gas in the intestinal loop. The right radiograph shows the dilated small bowel marked in blue.

Figure 40: Two identical abdominal radiographs showing dilated small bowel. The small bowel is visible as there is gas (black) within. You can tell that it is small bowel as it is centrally located and valvulae conniventes can be seen throughout. The loops measure >3 cm in diameter and are therefore dilated. The right radiograph shows the dilated small bowel marked in blue. (You can also see a wire from an intra-cardiac device.)

Figure 41: Two identical abdominal radiographs showing dilated small bowel. The small bowel is visible as there is gas (black) within. The loops of bowel are centrally located and valvulae conniventes are seen in the upper loops. The loops measure >3 cm in diameter and are therefore dilated. You can also see gas within the ascending colon, which is within normal limits. The right radiograph shows the dilated small bowel marked in blue.

Figure 42: Two identical abdominal radiographs of a patient with a gallstone ileus. There are branching dark lines (gas) projected over the centre of the liver, larger and more prominent towards the hilum, in keeping with pneumobilia. There are centrally located loops of bowel measuring >3 cm in diameter with valvulae conniventes seen throughout, in keeping with dilated small bowel. There is a calcified opacity projected over the left sacrum in keeping with a large calcified gallstone. The right radiograph shows the pneumobilia marked in dark blue, dilated small bowel marked in blue and gallstone marked in yellow.

Figure 43: Two identical images showing a loop of dilated large bowel with the classical radiographic

appearances of haustra. The right image shows the haustra highlighted in green.

Figure 44: Two identical abdominal radiographs showing dilated large bowel. The large bowel is visible as there is gas (black) within. You can tell that it is large bowel as it is distended >5.5 cm, circumferentially located and haustra are seen within. The right radiograph shows the dilated large bowel marked in green.

Figure 45: Two identical abdominal radiographs showing dilated large bowel. The large bowel is visible as there is gas (black) within. You can tell that it is large bowel as it is distended >5.5 cm (much larger than dilated small bowel would usually get) and haustra are seen within. The right radiograph shows the dilated large bowel marked in green.

Figure 46: Two identical abdominal radiographs showing dilated large bowel. The large bowel is visible as there is gas (black) within. You can tell that it is large bowel as it is distended >5.5 cm, circumferentially located and haustra are seen within. The right radiograph shows the dilated large bowel marked in green.

Figure 47: Two identical abdominal radiographs showing dilated large bowel and two loops of dilated small bowel. The bowel is visible as there is gas (black) within. The large bowel loops are distended >5.5 cm, circumferentially located and a few haustra are seen within. The two loops of distended small bowel are identified by the presence of valvulae conniventes and indicate incompetence of the ileocecal valve since gas has passed retrogradely from the large bowel into the small bowel. The right

radiograph shows the dilated large bowel marked in green and the dilated small bowel marked in blue.

Figure 48: Diagrammatic representation of a sigmoid volvulus. The sigmoid colon has its own mesentery, which is liable to twisting causing obstruction and distension of the sigmoid colon with gas.

Figure 49: Diagrammatic representation of a caecal volvulus. The caecum has twisted causing obstruction and distension of the caecum with gas.

Figure 50: Two identical abdominal radiographs showing a sigmoid volvulus. There is a ‘coffee bean’–shaped loop of distended bowel crossing the midline and extending to the right upper quadrant. There is a general lack of haustra. The proximal large bowel is somewhat distended secondary to the obstruction from the volvulus. The right radiograph shows the sigmoid volvulus marked in brown. (You can also see a left hip prosthesis.)

Figure 51: Two identical abdominal radiographs showing a sigmoid volvulus. There is a ‘coffee bean’–shaped loop of distended bowel crossing the midline and extending to the right upper quadrant. There is a general lack of haustra. The right radiograph shows the sigmoid volvulus marked in brown.

Figure 52: Two identical abdominal radiographs showing a caecal volvulus. There is a rounded comma-shaped loop of distended large bowel in the centre of the abdomen with haustra seen within. The remainder of the colon distal to the caecal volvulus (obstruction) is collapsed. The right radiograph shows the caecal volvulus marked in red.

Figure 53: Two identical abdominal radiographs showing a caecal volvulus. There is a rounded

comma-shaped loop of distended large bowel in the centre of the abdomen with a few haustra seen within. The remainder of the colon distal to the caecal volvulus (obstruction) is collapsed. The right radiograph shows the caecal volvulus marked in red.

Figure 54: Diagrammatic representation of the appearance of a dilated stomach full of gas. There is a large U-shaped or stomach-shaped loop of bowel in the left upper quadrant. If very large, the stomach can extend inferiorly over the centre of the abdomen.

Figure 55: Two identical abdominal radiographs showing a gas-filled dilated stomach. There is a loop of stomach-shaped distended bowel in the upper abdomen. On the right side of the abdomen, you can see that the duodenum is partially distended as valvulae conniventes are seen. The findings are suggestive of a proximal small bowel obstruction, possibly in the region of the distal duodenum or proximal jejunum. The right radiograph shows the dilated stomach in light blue and the loop of duodenum in blue.

Figure 56: Two identical abdominal radiographs showing a right groin hernia. There is a loop of gas-filled bowel projected over the right groin area below the right obturator foramen and below the level of the inguinal ligament. The right radiograph shows the herniated loop of bowel in green and the position of the right inguinal ligament in grey.

Figure 57: Two identical abdominal radiographs showing a left groin hernia. There is a loop of gas-filled bowel projected over the left groin area over and below the left obturator foramen and below the level of the inguinal ligament. The right radiograph

shows the herniated loop of bowel in green and the position of the left inguinal ligament in grey.

Figure 58: Two identical abdominal radiographs showing a left groin hernia. There is a loop of gas-filled bowel projected over the left groin area below the left obturator foramen and below the level of the inguinal ligament. The right radiograph shows the herniated loop of bowel in green and the position of the left inguinal ligament in grey. The white dotted line indicates the position of overhanging anterior abdominal wall in this overweight patient.

Figure 59: **1.** Diagrammatic representation of normal appearances of the colonic bowel wall with thin haustral folds projecting into the bowel lumen. **2.** Diagrammatic representation of the appearances of '**thumbprinting**'. The colonic wall is inflamed causing severe thickening of the haustral folds, which now appear as 'thumb-shaped' projections into the bowel lumen.

Figure 60: Two identical abdominal radiographs showing colonic bowel wall inflammation. There is thickening of the bowel wall with thickening of the haustral folds in the transverse colon. The descending colon is featureless with loss of the normal haustra. The right radiograph shows the inflamed bowel marked in green and the bowel wall thickening marked in light green. (You can also see an umbilical piercing.)

Figure 61: Two identical abdominal radiographs showing bowel wall inflammation throughout the colon. There is thickening of the bowel wall and the colon appears featureless with loss of the normal haustra due to chronic inflammation. This is an example of pancolitis (disease throughout the large

intestine). The right radiograph shows the inflamed bowel marked in green and the bowel wall thickening marked in light green.

Figure 62: Two identical abdominal radiographs showing colonic bowel wall inflammation. The bowel wall thickening is most easily seen in the transverse colon with severe thickening of the haustral folds giving the appearance of ‘thumbprinting’. The right radiograph shows the inflamed bowel marked in green and the bowel wall thickening marked in light green.

Figure 63: Two identical abdominal radiographs showing evidence of chronic colonic bowel wall inflammation. The rectum, sigmoid and descending colon are featureless with loss of the normal haustra and have a ‘lead pipe’ appearance. The right radiograph shows the featureless bowel marked in green.

Figure 64: Two identical abdominal radiographs showing colonic bowel wall inflammation. There is slight thickening of the bowel wall, and the descending colon is featureless with loss of the normal haustra giving a ‘lead pipe’ appearance. The right radiograph shows the featureless bowel marked in green and the bowel wall thickening marked in light green.

Figure 65: Two identical abdominal radiographs of a patient with toxic megacolon. The transverse colon is dilated to >6 cm diameter. There are multiple small lobulated masses in the lumen in keeping with inflammatory pseudopolyps, and there is evidence of bowel wall thickening. There is also loss of the normal faecal matter within the large bowel. The right radiograph shows the areas of clearly abnormal

large bowel marked in green and the thickened bowel wall and inflammatory pseudopolyps marked in light green.

Figure 66: Two identical abdominal radiographs showing faecal loading. There is faecal material throughout the large bowel in keeping with faecal loading. Please note this is not the same as constipation which is a clinical diagnosis. The right radiograph shows the faecal material marked in brown. (You can also see sterilisation clips in the pelvis.)

Figure 67: Two identical abdominal radiographs showing faecal impaction. There is a huge volume of faecal material extending from the pelvis to the left upper quadrant in keeping with a huge faecal impaction causing massive distension of the rectum. The right radiograph shows the faecal material marked in brown.

Chapter 10

Figure 68: Two identical abdominal radiographs showing calcified gallstones projected over the right upper quadrant. In this example the gallstones are polygonal in shape and have a radiopaque outline with a lucent centre. The right radiograph shows the gallstones marked in yellow.

Figure 69: Two identical abdominal radiographs of the abdomen showing calcified gallstones projected over the right upper quadrant. In this example there are many gallstones of varying size. They are polygonal in shape and have a radiopaque outline with a lucent centre. The gallstones are seen to clearly outline the lower border of the gallbladder.

The right radiograph shows the gallstones marked in yellow.

Figure 70: Two identical radiographs of the upper abdomen showing milk of calcium or ‘limey’ bile. There is a rounded gallbladder-shaped density projected over the right upper quadrant. If you look carefully you can see a few circular gallstones outlined at the superior aspect of the gallbladder. The right radiograph shows the milk of calcium or ‘limey’ bile marked in yellow.

Figure 71: Two identical radiographs of the upper abdomen showing a porcelain gallbladder. There is a curvilinear gallbladder-shaped area of calcification projected over the right upper quadrant. The right radiograph shows the porcelain gallbladder marked in yellow.

Figure 72: Two identical radiographs of the right side of the abdomen with the path of the urinary tract marked in white. A calculus may be found at any point along the tract. Renal calculi will be seen in the region of the calyces (1) or renal pelvis (2). Ureteric calculi are seen along the line of the ureter (3) which runs along the line of the transverse processes (4). Bladder calculi will be seen in the region of the urinary bladder (5).

Figure 73: Two identical abdominal radiographs showing a left staghorn calculus and right-sided renal calculi. There is a large staghorn-shaped calcific density seen projected over the left kidney and two smaller calcific densities are noted projected over the right kidney. The right radiograph shows the left staghorn calculus and right renal calculi marked in yellow.

Figure 74: Two identical abdominal radiographs showing a left staghorn calculus and right-sided renal calculi. There is a large staghorn-shaped calcific density projected over the left kidney and a few smaller calcific densities are noted projected over the right kidney. The right radiograph shows the left staghorn calculus and right renal calculi marked in yellow.

Figure 75: Two identical abdominal radiographs showing bilateral renal calculi. There are a few small calcific densities projected over the left kidney and a small calcific density is projected over the lower pole of the right kidney in keeping with renal calculi. The right radiograph shows the renal calculi marked in yellow.

Figure 76: Two identical abdominal radiographs showing ureteric calculi. There are two small calcific densities projected to the right of the lumbar spine. These are most likely in keeping with ureteric calculi as they are projected over the line of the right ureter and are too small to be calcified lymph nodes. The right radiograph shows the ureteric calculi marked in yellow, the position of the right kidney marked in white and the line of the right ureter marked with a white dashed line.

Figure 77: Two identical abdominal radiographs showing a bladder calculus. There is a large, midline, oval-shaped opacity projected over the lower pelvis. The right radiograph shows the bladder calculus marked in yellow.

Figure 78: Two identical abdominal radiographs showing a bladder calculus. There is a large, roughly midline, oval-shaped opacity projected over the lower pelvis. If you look carefully at the outer edge, there is

are bilateral areas of irregular calcification projected either side of the midline at the level of the upper pole of the kidneys. The right radiograph shows the adrenal gland calcification marked in yellow and the approximate position of the kidneys (not seen clearly) marked with a white dashed line.

Figure 85: Two identical abdominal radiographs showing AAA calcification. There is a large dilated vascular structure in the midline with wall calcification seen. The left wall is clearly seen; however, the right wall is more difficult to make out as it is projected over the lumbar spine. It measures over 3 cm in diameter. The right radiograph shows the AAA marked in red.

Figure 86: Two identical abdominal radiographs showing AAA calcification. There is a large dilated vascular structure in the midline with wall calcification seen. The left wall is clearly seen; however, the right wall is more difficult to make out as it is projected over the lumbar spine. It measures over 3 cm in diameter. The right radiograph shows the AAA marked in red.

Figure 87: Two identical abdominal radiographs showing AAA calcification. There is a large dilated vascular structure in the midline with wall calcification seen. The left wall is clearly seen; however, the right wall is more difficult to make out as it is projected over the lumbar spine. It measures over 3 cm in diameter. The right radiograph shows the AAA marked in red.

Figure 88: Two identical abdominal radiographs showing a fetus in situ. The spine of the fetus can be seen to the right of the midline, lower limbs in the upper abdomen, upper limbs in the centre of the

abdomen and the skull in the pelvis. This fetus is large and nearly term. The right radiograph shows the skeleton of the fetus marked in yellow.

Figure 89: The top radiograph (1) shows a patient without costal cartilage calcification. The middle radiograph (2) shows a patient with costal cartilage calcification. The bottom radiograph (3) shows the calcification marked in yellow.

Figure 90: Two pairs of identical abdominal radiographs showing phleboliths in the pelvis. They are of calcific density and a few show the classical lucent centre. The phleboliths are marked in yellow.

Figure 91: Two pairs of identical abdominal radiographs showing calcified mesenteric lymph nodes. There are multiple oval-shaped areas of mottled calcification projected over the right lower quadrant/central abdomen. The calcified lymph nodes are marked in yellow.

Figure 92: Two pairs of identical abdominal radiographs showing calcified uterine fibroids. There are rounded areas of calcification projected over the pelvis with irregular areas of calcification within. The calcified uterine fibroids are marked in yellow.

Figure 93: Two identical abdominal radiographs showing calcification of the prostate gland. There is irregular calcification projected over the lower pelvis just below the position of the urinary bladder. The right radiograph shows the prostate gland calcification marked in yellow.

Figure 94: Two identical abdominal radiographs showing calcification in the wall of the abdominal aorta. There are areas of linear calcification outlining the abdominal aorta, common iliac arteries, external

cause is prostate metastasis. The right radiograph shows the sclerotic lesions marked in red.

Figure 99: Two pairs of identical radiographs showing a lucent bone lesion. If you compare the left and right sides, you can see an ill-defined area of lucency in the right pubic bone, with loss of the normal dense bone appearance. In this case the lucent lesion was a metastasis. The right radiograph shows the lucent lesion marked in red.

Figure 100: (1a) AP and (1b) lateral radiographs of the lumbar spine in the same patient showing an example of a wedge compression fracture of the L2 vertebral body. Note how there is loss of height of the L2 vertebral body (white arrow) when compared to the vertebrae above and below. (2a) AP and (2b) lateral radiographs of the lumbar spine in the same patient showing an example of a compression fracture of the L3 vertebral body. Note how there is loss of height of the L3 vertebral body (white arrow) when compared to the vertebrae above and below. There is also spinal metal work in situ providing mechanical support to the lumbar spine either side of the fracture.

Figure 101: A radiograph of a patient with thoraco-lumbar scoliosis. The thoraco-lumbar spine is curved with concavity to the right.

Figure 102: Diagram of a vertebra as seen from above with both left and right pedicles marked in yellow.

Figure 103: Two identical abdominal radiographs showing absence of the left L3 pedicle due to destruction by a spinal metastasis. The normal dense oval shape of the left pedicle of L3 is no longer

visualised. The right radiograph shows the position of the missing pedicle shown with a white circle.

Figure 104: Two identical abdominal radiographs showing a ‘bamboo spine’ in a patient with ankylosing spondylitis. There is a dense vertical line in the midline caused by ossification of the interspinous and supraspinous ligaments (black arrows). There is fusion (ankylosis) of the vertebrae by marginal syndesmophytes (white arrows). This gives the overall appearance of a spine that looks a bit like a bamboo stick. The right radiograph shows the ‘Bamboo spine’ marked in yellow.

Figure 105: Two identical abdominal radiographs showing a Riedel’s lobe (normal variant). The right lobe of the liver is enlarged and extends inferiorly. The right radiograph shows the enlarged liver marked in purple. (You can also see an ECG lead in the left upper quadrant).

Figure 106: Two identical abdominal radiographs showing a large soft tissue mass in the left lumbar region. There is a rounded soft tissue density in the region of the left kidney. In this case the underlying cause was a large renal cyst. The right radiograph shows the soft tissue mass marked in red.

Figure 107: Two identical abdominal radiographs showing a large soft tissue mass in the pelvis/central abdomen. There is a large soft tissue density arising from the pelvis and extending into the left upper quadrant. It is displacing the surrounding loops of bowel to the edge of the radiograph. In this case the underlying cause was a large ovarian cyst. The right radiograph shows the large pelvic/central abdominal mass marked in pink.

Chapter 12

Figure 108: Two different radiographs showing metallic cholecystectomy clips projected over the right upper quadrant in the region of the gallbladder. This is a very common finding as cholecystectomy is a common operation. Usually there are three clips, although there may be more.

Figure 109: Two different radiographs showing sterilisation clips projected over the pelvis. They have a distinctive appearance and there are usually one or two clips seen bilaterally (for each of the fallopian tubes). Often over time these clips migrate and can be seen elsewhere in the abdomen (e.g. under the liver) – this is not a problem.

Figure 110: A radiograph showing numerous surgical clips projected over the right upper quadrant. This appearance is typical for previous liver resection surgery.

Figure 111: A radiograph showing surgical staples projected over the midline from a recent midline laparotomy.

Figure 112: Two identical radiographs showing evidence of a right inguinal hernia repair. There are multiple helical coil fasteners projected over the right iliac fossa. The appearance of these small coils is characteristic and indicates the site of a previous hernia repair. The coils fasten a surgical mesh to the inside of the abdominal wall to cover any areas of weakness and prevent a hernia. The mesh is not normally visualised on an abdominal radiograph. The right radiograph shows the rough position of the hernia mesh repair marked in orange.

Figure 113: Eight different radiographs of bowel anastomoses. They may be tricky to visualise as they are very small and not particularly dense. They appear as a curly line of multiple tiny clips and indicate the site of a bowel anastomosis. In a few of the radiographs the bowel anastomoses are very difficult to visualise so are marked with white arrows.

Figure 114: Two identical abdominal radiographs showing a urinary catheter in situ. There is a tube projected over the lower pelvis with its tip projected over the position of the urinary bladder. The right radiograph shows the urinary catheter marked in purple.

Figure 115: Two identical abdominal radiographs showing a supra-pubic catheter in situ. There is a tube projected over the lower pelvis with its tip pointing inferiorly and projected over the position of the urinary bladder. The right radiograph shows the supra-pubic catheter marked in purple.

Figure 116: Two identical abdominal radiographs showing a nasogastric (NG) tube in situ. There is a tube projected over the upper abdomen in the region of the stomach. The right radiograph shows the NG tube marked in purple and the approximate position of the stomach marked in brown.

Figure 117: Two identical abdominal radiographs showing a nasojejunal (NJ) tube in situ. There is a tube projected over the upper and mid abdomen, following the curve of the duodenum with its tip to the left of the midline in the region of the proximal jejunum. The right radiograph shows the NJ tube marked in purple and the approximate position of the stomach marked in brown.

Figure 118: Two identical radiographs showing a flatus tube in situ. There is a large tube projected over the pelvis and lower abdomen, following the path of the rectum and sigmoid colon. The right radiograph shows the flatus tube marked in purple. (You can also see dilated loops of large bowel.)

Figure 119: Two identical radiographs showing a simple surgical drain in the pelvis. There is a tube projected over the right pelvis in keeping with a pelvic drain. The right radiograph shows the surgical drain marked in purple. (You can also see midline surgical staples from recent surgery.)

Figure 120: Two identical abdominal radiographs showing a left-sided nephrostomy catheter in situ. There is a left-sided ‘pigtail’ nephrostomy catheter with a coiled tip (like a pig’s tail) projected over the region of the left kidney. The right radiograph shows the left sided nephrostomy catheter marked in purple and the approximate position of the left kidney (not seen clearly) marked with a white dashed line.

Figure 121: Two identical abdominal radiographs showing a peritoneal dialysis catheter. The coiled tip is seen projected over the pelvis. The right radiograph shows the peritoneal dialysis catheter marked in purple.

Figure 122: Two identical abdominal radiographs showing a gastric band device in situ. The inflatable ring is projected over the epigastric region (in the correct orientation) and tubing is seen connecting the inflatable ring to the access port. The inflatable ring and tubing are marked in orange and the access port is marked in pink. The approximate position of the stomach is marked in brown.

Figure 123: Two identical abdominal radiographs showing a gastrostomy tube in situ. The tubing seen across the lower part of the radiograph is outside the patient, the triangular fixation device is on the skin at the point of entry and the circular tip is within the stomach. The right radiograph shows the gastrostomy marked in orange, the triangular skin fixation device marked in pink and the approximate position of the stomach marked in brown.

Figure 124: Two identical radiographs of the right lower quadrant showing a stoma bag. There is a dense ring projected over the right lower quadrant in keeping with the skin attachment of the stoma bag. The stoma itself is seen as a dense opacity within the ring of the stoma bag. The stoma bag is marked in pink and the stoma itself is marked in red.

Figure 125: Three different radiographs of the right upper quadrant showing examples of biliary stents. They are placed within the common bile duct and/or hepatic ducts and are usually projected just to the right of the midline in the upper abdomen. The left radiograph shows a metal stent, the middle shows a plastic stent and the right both a metal and plastic stent in situ.

Figure 126: Two identical abdominal radiographs showing a JJ stent in the right ureter. The proximal end is coiled in a loop in the renal pelvis and the distal end is coiled in a loop in the urinary bladder. The ‘JJ’ in JJ stent refers to the fact that there is a small coil at each end. The right radiograph shows the JJ stent marked in purple, the outline of the right kidney (1) marked with a white dashed line and the approximate outline of the urinary bladder (2) also marked with a white dashed line.