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FIVE CASES TO CONTRIBUTE TO CONTINUOUS PROFESSIONAL DEVELOPMENT LIFELONG LEARNING

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Abstract

Five cases with different 'pathologies' are described. Pathology seen on an enhanced CT study is presented. Abnormal patterns in the soft tissue of the neck in a cervical spine radiograph are presented. Incidental extracolonic findings at CT colonography, and a CT case of asbestosis, are presented. An overview of each of the findings is provided in terms of the literature.

FIVE CASES

Case 1

Images of an enhanced CT study are presented in Figure 1a to d. These images of a 75 year old man illustrate the importance of a range of CT views. He presented with a clinical history of a large left testicle, which on some days seem larger than on other days. Clinical examination revealed a normal sized left testicle. On straining his bowel was felt to be entering a hernial defect into the scrotum on the left.

Hernias may either be congenital or acquired. The former occurs in neonates; whereas in adults a hernia is due to stress on the abdominal wall, or a weakness in the elderly.[1] Indirect inguinal hernias are the most common. They protrude through the patent internal (deep) inguinal ring lateral to the inferior epigastric vessels; in men the hernia may extend together with the spermatic cord into the scrotum, and in women it may follow the course of the round ligament into the labia majora.[2] Inguinal hernias are 20 times more common in men than in women.[3,4]

Complications of abdominal wall hernias include obstruction, incarceration and strangulation.[5] Incarceration occurs when a hernia cannot be reduced or pushed back manually. Diagnosis may be suggested if a hernia occurs through a small defect and the hernial sac has a narrow neck; incarceration may predispose to obstruction, inflammation or ischaemia, which is due to a compromised blood supply.[5] Strangulation may be caused by incarceration when there is free fluid within the hernia sac, bowel wall thickening is present or bowel is dilated; ischaemia or strangulation occurs if the blood supply is compromised. This happens when there is obstruction to the afferent and efferent loops by the hernia defect.[5] Surgical procedures (e.g., open repair; laparoscopic suture repair) with or without mesh are performed for abdominal wall hernias repair; inguinal hernia repair is the commonest one for hernia;[6] >96% of inguinal hernia repairs are performed on men.

Figure 1a. Axial view of the right and left inguinal region. There is small indirect inguinal hernia on the right side (red arrow) containing a small amount of fat. There is evidence of two loops of large bowel (red circle) on the left side with stool within the hernia.

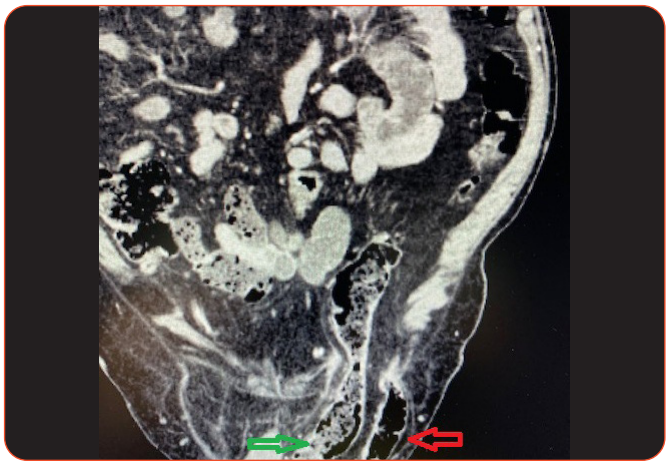

Figure 1b. Contrast enhanced coronal view showing a large loop of sigmoid colon with faecal material within the inguinal canal. The bowel enters the scrotal sac. Green arrow = bowel entering the hernial sac; red arrow = bowel leaving the scrotal sac.

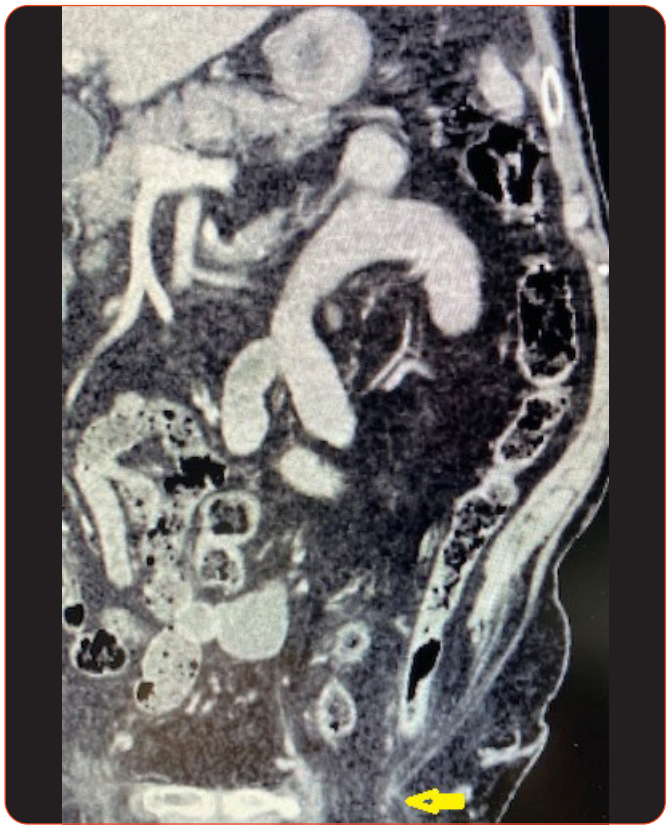

Figure 1c. A contrast enhanced axial view of the large inguinal defect (yellow arrow).

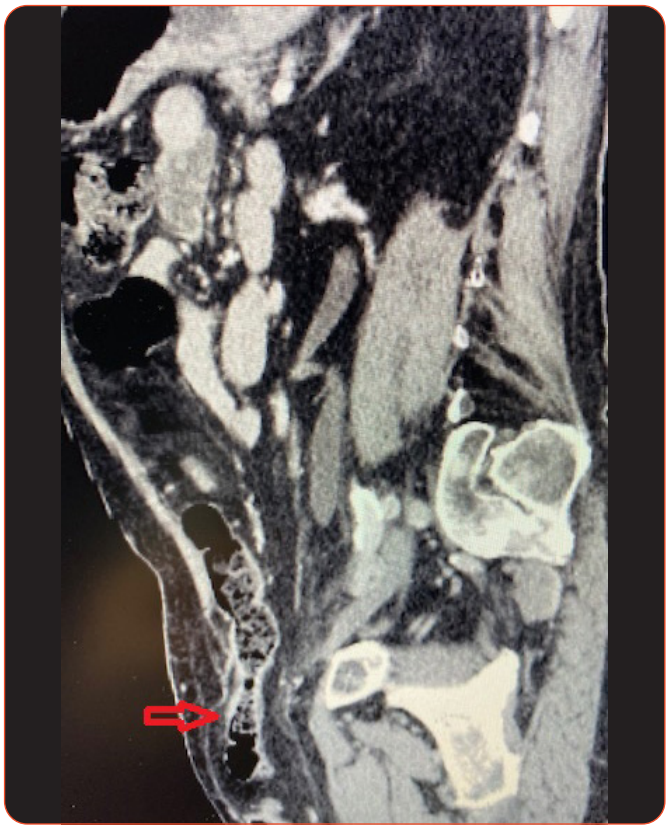

Figure 1d. Sagittal enhanced view showing large bowel entering the hernial defect (red arrow) on its way into the scrotum.

Case 2

Figure 2 is a cervical spine radiograph. This image is of a 34 year old man who presented to a chiropractor because of neck pains. After manipulation treatment he felt no better. He was then referred for acupuncture. He later presented for cervical spine radiography as he still complained of pain. It was thus assumed that he had typical acupuncture treatment. According to the literature Chinese acupuncture is a method of placement of fine sterile needles with a diameter of 1mm into subcutaneous tissue along specific meridian lines for between 10-15 minutes. The needles are then removed. The needles are typically 10-15mm long.[7-9]

As evident in Figure 2 there are multiple metal fragments. A subtype of acupuncture, which is primarily practiced in Japan and Korea, is known as Hari. This type of acupuncture involves permanent placement of fine needles.[8] Literature reports that Hari acupuncture is thought to be a method of continuous control of pain.[7] Gold, silver or stainless steel needles are inserted 3cm into subcutaneous tissue and broken off at the skin; a spring-loaded syringe is also available.[7] The number of permanent needles varies in a patient from a few to thousands. Complications reported in the literature range from epidermal cysts to migration.[7-9] The use of Hari acupuncture is now practiced in North America in Asian communities.[10] Literature underscores that knowledge of the practice of Hari acupuncture and its radiographic features (e.g. hedgehog-like spine) is important to avoid unnecessary imaging.[10] Stainless steel needles have been found to not induce radiofrequency heating during MRI studies, but it is important to consider other metal alloys; obtaining a full clinical history for retained metallic pieces is essential.[10]

Figure 2. AP view of odontoid peg showing a normal atlantoaxial joint. There are multiple metal linear and branching densities in the soft tissue of the neck. These densities are consistent with thin metal acupuncture needles.

Case 3

An extracolonic finding (ECF) at screening CT colonography (CTC) is presented in Figure 3 a to c. This case is of a 62 year old female who presented for a screening CTC study, which was normal study apart from a few scattered right and left diverticula. The images show an incidental ECF of a left ovarian dermoid cyst.

During the early stages of foetal development some skin layers do not grow as they should and form a dermoid cyst.[11-13] A dermoid cyst is a benign tumour which tends to grow slowly. These cysts can form anywhere in the body; usually in the ovary, testes, skin of the head, neck, face or lower back. They contain tissues found in the outer layer of skin as well as sweat and oil glands and may contain elements of hair and teeth. As evident in Figure 3c there are foci of calcification.

Ovarian dermoid cysts can develop during the reproductive years of women. These cysts can cause infection, rupture, and cancer. Management and treatment of an ovarian dermoid cyst may require invasive surgery; either conventional surgery or laparoscopy.[11]

Figure 3a. Axial view showing an area of decreased density on the left side of the pelvis (red circle). Note the indentation of the bladder on the left lateral aspect.

Figure 3b. Axial view showing internal densities in the lesion (red circle) and indentation of the left lateral bladder wall.

Figure 3c. Sagittal view showing the outline of the lesion (red circle). There are a few densities inferiorly indicating foci of calcification (green arrow).

Case 4

A pelvic mass seen at CTC is presented in Figure 4a to h. This case underscores the benefit of CTC compared to optical colonoscopy (OC). The main advantage of CTC is detection of lesions outside of the colon. Intracolonic pathology is seen at OC. Intracolonic pathology and pathology in extracolonic structures are seen at CTC. These images show an extracolonic pathology of a 79 year old female. She presented to her family doctor complaining of heaviness in the pelvis and increasing constipation. A physical examination was not done. In view of her increasing constipation an OC was recommended; she however opted for a CTC study. As shown in Figure 4a there is marked displacement of the sigmoid colon. The 2D images (Figure 4b to h) show a pelvic mass that is compressing the bladder. The extracolonic finding (ECF) is in keeping with a uterine fibroid, also called a leiomyoma or myoma.[14] A uterine fibroid is a benign neoplasm; it develops in 20-40% of women during their reproductive years.[15] The etiology of this benign tumour is not known.[16] As shown in Figure 4c and d there is a low-density mass in the pelvis. A low-attenuating uterine mass at CT may be a necrotic or degenerating fibroid.[17] When there is a rapid growth of a fibroid its nearby blood vessels are not able to supply it with oxygen and nutrients and this causes necrosis.[15] The latter (i.e., fibroid degeneration) is categorised as: hyaline, cystic, red or calcific. Note the focus of calcification in Figure 4c, g and h. A sudden very rapid growth of a uterine fibroid in a postmenopausal woman could suggest a sarcomatous fibroid (leiomyosarcoma).[18] This malignant tumour occurs in less than 1% of cases.[18] Uterine sarcomas originate from uterine tissues; they have an aggressive and poor prognosis.[19]

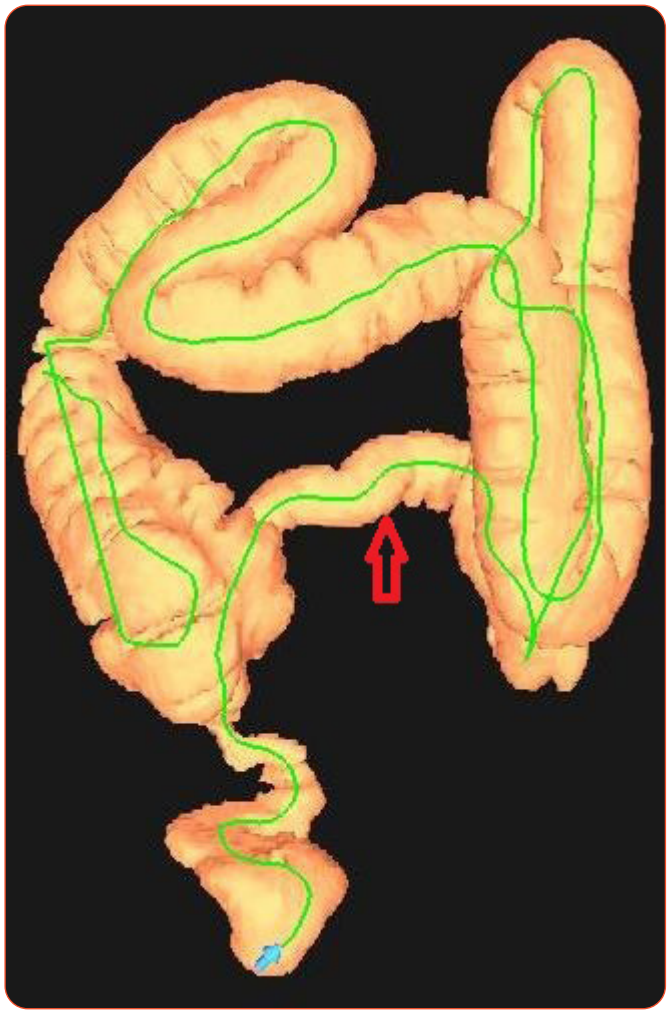

Figure 4a. Colon-map showing marked displacement of sigmoid colon (red arrow).

Figure 4b. Unenhanced axial view showing uterus (U) and compressed bladder (B).

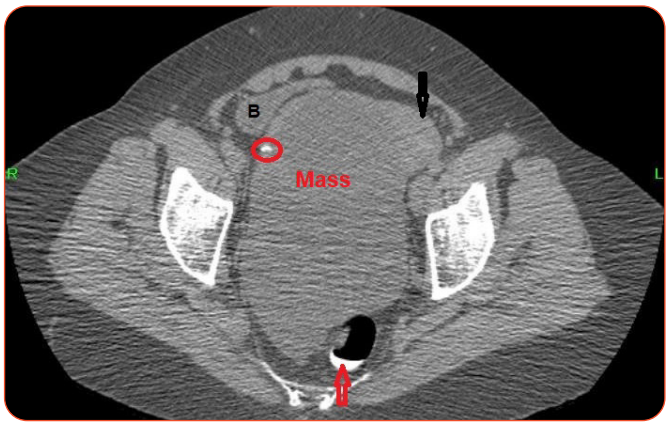

Figure 4c. Unenhanced axial scan showing part of the uterus in left upper corner (black arrow) and low density mass below. Compressed bladder seen on the right (B) and uterus showing increased density on left. Focus of calcification (red circle) seen superiorly on the right. Rectum = red arrow.

Figure 4d. Unenhanced sagittal view showing low density mass (red arrow) arising from the uterus in keeping with a large fibroid undergoing necrosis.

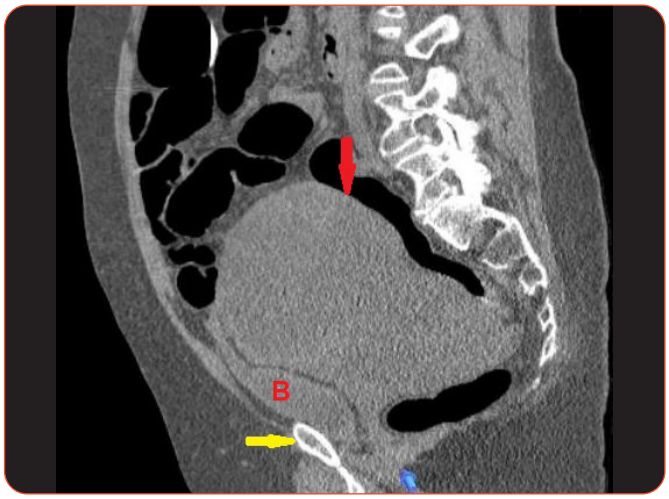

Figure 4e. Sagittal unenhanced view to the right of midline showing a mass (red arrow) with decreased density. Compressed bladder (B). Pubic symphysis (yellow arrow).

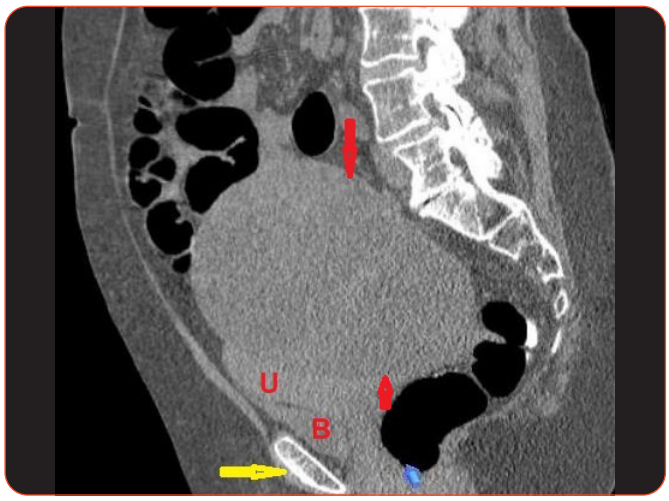

Figure 4f. Sagittal unenhanced view near the mid-line showing pelvic mass (red arrows). U = uterus. B = markedly compressed bladder. Pubic symphysis (yellow arrow).

Figure 4g. Unenhanced sagittal view showing mass (red arrows) and focus of calcification (red circle). Bladder = B.

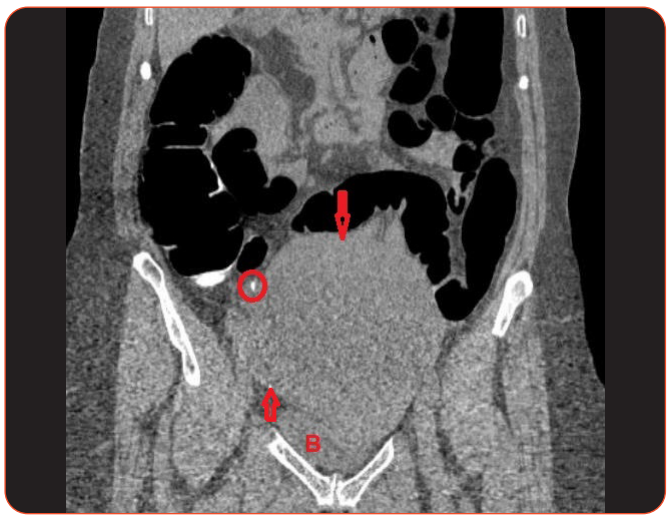

Figure 4h. Coronal view showing mass (red arrows) and focus of calcification (red circle). Bladder (B).

Case 5

Figure 5 is a case of asbestosis. Asbestos has been used for centuries. Asbestosis mining in South Africa commenced in the early 1800s. In the early 20th century lung disease was noted in those working with asbestos.[20] Inhalation of asbestos fibres (airborne particles) causes asbestosis which is an interstitial lung disease.[21]

Pleural plaques are shown in Figure 5. These plaques are benign sections of thickened tissue, which form in the pleura or lung lining, indicative of exposure to asbestos fibres. The plaques develop 10 to 30 years after initial exposure to asbestos; they often develop on the parietal pleura that lines the inside of the rib cage.[22] Mesothelioma may occur in those with asbestosis.[22] According to the World Health Organisation (WHO) about 125 million people in the world are exposed to asbestos in the workplace; such exposure accounts for approximately half of occupational cancer deaths.[23] Asbestosis is a noncommunicable disease. The WHO, in collaboration with the International Labour Organisation, other intergovernmental organisations and civil society, continuously works with countries towards elimination of this disease.[23]

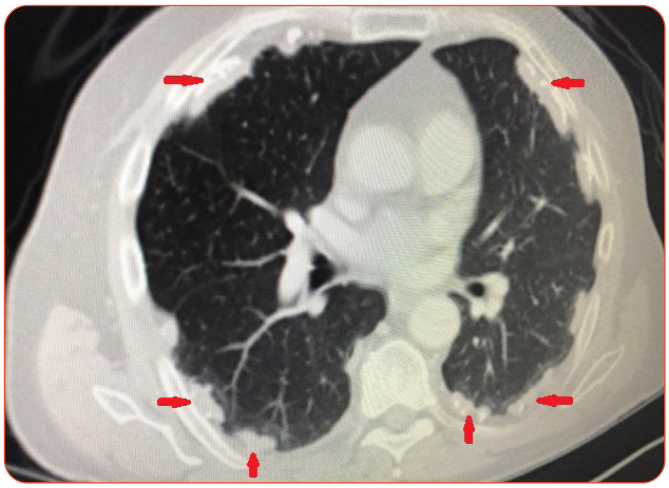

Figure 5. Axial CT scan showing asbestosis plaque (red arrows).

CONCLUSION

The findings of five cases are presented. A brief overview of literature germane to each case is presented to underscore the need for lifelong learning.

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