

**Cases 1 to 3 compiled by Joel H Bortz.**

**Cases 4 to 8 compiled by Riaan van de Venter**

**CASE 1**

A 60 year old asymptomatic male presented for screening CT colonography. In the three images presented what has happened between Figure 1 (a,b) and Figure 2?

**Answer**

Figure 1(a) shows air in the stomach (open white arrow) and small bowel (open green arrows). In Europe and South Africa, Buscopan is often used to relax the bowel for good distension and may relax the ileo-caecal valve. This may result in the small bowel filling with carbon dioxide.

In this case a spasmolytic was not used. This means the valve is incompetent thus carbon dioxide refluxed into the small bowel and rapidly reached the stomach.<sup>[1]</sup> When this occurred, the patient complained of nausea. The patient was instructed to burp, causing immediate relief.

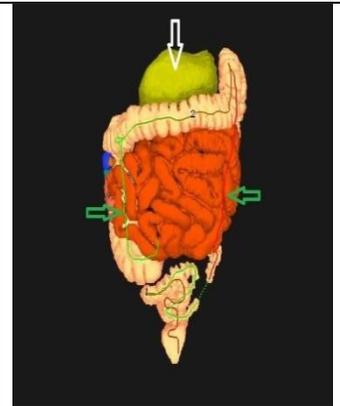
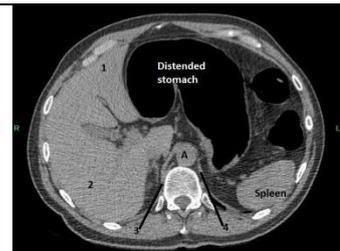


Figure 1 (b) shows a distended stomach. A = aorta; 1= left lobe of liver; 2 = right lobe of liver; 3 = crux right diaphragm; 4 = crux left diaphragm



Post-burp Figure 2 shows a small amount of air in the stomach; the small bowel has emptied.



**Reference**

1. Bortz, JH. An approach for performing a successful computed tomography colonography examination. S Afr J Rad. 2014;18(1); Art. #607, 11 pages. [http:// dx.doi.org/10.4102/sajr. v18i1.607](http://dx.doi.org/10.4102/sajr.v18i1.607)

## CASE 2

A 59 year old female who is asymptomatic presented for a screening CT colonography. The CTC was normal.

a) What extracolonic abnormality was detected?

**Answer:** Cancer of the right kidney



2D axial view shows renal mass (open white arrow).

LK = left kidney.

A= aorta showing moderate atherosclerosis (black arrow).

b) What E- classification will it be if

- E1 = not of clinical importance,
- E2= low clinical importance, thus no immediate impact on patient management,
- E3 = moderate importance,
- E4 = significant importance and must be reported to the referring physician.

**Answer:** E4

c) What imaging examination/s would confirm the finding?

**Answer:** CT with iv contrast media, ultrasound or magnetic resonance imaging. The latter is useful in the investigation of renal cancer patients especially in deciding whether there is invasion of the renal vein or inferior vena cava by tumour cells.

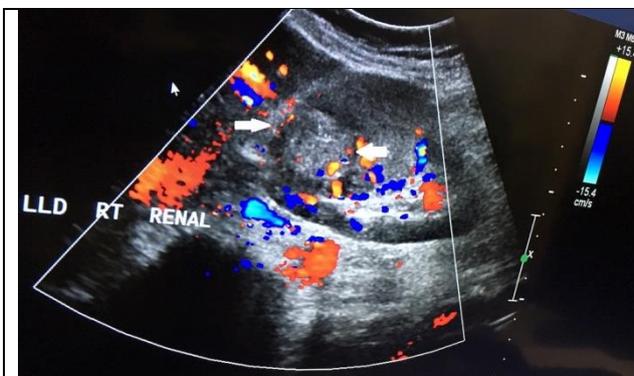


Fig a. Ultrasound of the right kidney shows increased vascularity, and a mass (white arrows) with areas of necrosis.



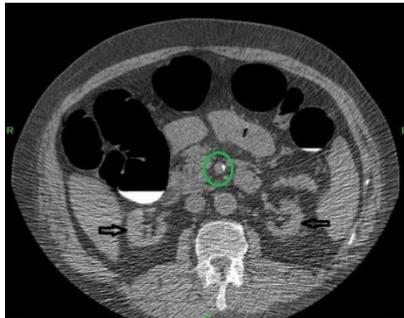
Fig b. Ultrasound scan shows heterogeneous mass (white arrows) with central necrosis

### CASE 3

A 70 yr. old male on dialysis presents with a positive Cologuard test\*. He was referred for a CTC study. The CTC was negative for cancer. A CTC study includes extracolonic structures visualised on 2D.

a) What are your findings of the 2D axial view?

**Answer:** Bilateral renal atrophy



Bilateral atrophic kidneys (open black arrows).

Note calcification of superior mesenteric artery (green circle).

b) What is your E- classification?

**Answer:** E4

c) What is the reason for your E-classification?

**Answer:** This is end- stage renal disease from either ischaemia or chronic renal disease.

\*Cologuard is a non-invasive screening option that detects early colon cancers based on stool DNA. Cologuard may produce false positive or false negative results. For example, an estimated 76% false positive results if diminutive polyps are included. It has limited sensitivity for advanced adenomas (less than 50%) whereas CTC has a sensitivity for over 90% for large polyps. CTC is much more effective than the stool test. Put differently, Cologuard may successfully detect up to 92% of colo-rectal cancer, but its sensitivity for large advanced adenomas is only 42%, falling well short in this critical area of cancer prevention.<sup>[1]</sup> In a typical average risk screening population, 1 in 20 individuals will harbor a large adenoma, whereas only 1 in 500 will have an invasive cancer. To put Cologuard in perspective, for a screening population of 10,000 adults, Cologuard would on average detect 18 cancers, miss 2 cancers and generate 1,300 false-positive results ( i.e. no cancer).<sup>[2]</sup>

### References

- 1) Imperiale TF, Ransohoff DF, Itzkowitz SH, et al. Multitarget stool DNA testing for colorectal- cancer screening. N Engl J Med 2014; 370 [14 ]: 1287-9
- 2) Yee J, Chair: Colon Cancer Committee, ACR letter to Medicare. Re. Proposed decision memo for screening for Colorectal cancer-Stool DNA Testing[ CAG- 0044N ], August 27, 2014.

## CASE 4

A 12 year old female presents to the x-ray department with a history of trauma to the right calcaneal area. Considering Figure 4, do you detect any abnormality? Give reasons for your answer.

### Answer



Figure demonstrates the normal apophysis of the calcaneus, on the postero-inferior aspect.

- The apophysis normally ossifies between the age of 4 to 7 in girls and 7 to 10 in boys <sup>[1]</sup> and is then visible on radiographs.
- The apophysis tends to fuse with the calcaneus between the ages of 12 and 15.

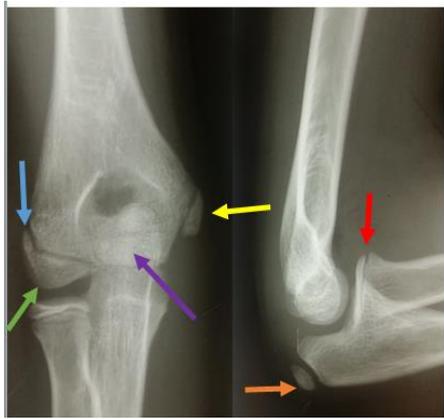
### Reference

1. Kumar *et al.* 1991:416. Available from:  
<http://pubs.rsna.org/doi/pdf/10.1148/radiographics.11.3.1852935>

## CASE 5

The patient presents with non-specific pain in the region of the elbow. Considering Figure 5 below, can any abnormality be detected? Give reasons for your answer. Can you determine the possible age of this patient? Give reasons for your answer.

### Answer



No abnormality can be detected from the radiographic images presented in Figure 5.

- The radiographs demonstrate the normal ossification processes involved in the elbow region.
- In respect of determining the possible age of this patient, one can use the CRITOL sequence to determine it and any injury to the elbow. The acronym **CRITOL** (capitulum, radial head, internal (medial) epicondyle, trochlea, olecranon, and lateral epicondyle) represents the order in which the ossification centers in the elbow region appear, and general age, the order is indicated below.
- Always remember, if the trochlea is seen but not the medial epicondyle, suspect an avulsion fracture of the latter.

- C** 1 year of age
- R** 3 years of age
- I** 5 years of age
- T** 7 years of age
- O** 9 years of age
- L** 11 years of age

## CASE 6

The patient presented to the accident and emergency department after falling earlier that day. Clinically the arm was swollen, and warm to touch. Figure 6 represents the resultant radiographs obtained. Can you detect any abnormality? Give reasons for your answer.

### Answer



Figure 6 demonstrates displaced posterior and anterior fat pads (red arrows).

- The red arrows indicate an effusion into the joint which is highly indicative of the presence of a fracture in the elbow region.
- A subtle distal humeral fracture is noted (purple arrow), due to the irregular outline of the capitulum.
- In addition, a subtle hair-line fracture through the radial head can also be noted (blue arrow).

## CASE 7

An adult male presented to the radiography department after he tripped and fell on his hand. Refer to Figure 7. Can you determine the abnormality present? Give reasons for your answer.

### Answer



Figure 7 presents an anterior dislocation of the lunate.

- The radiograph demonstrates the classic empty cup sign of the lunate. Normally, the capitate, lunate and distal radius articulate with one another in a straight, vertical line.
- The capitate articulates with the concavity of the lunate (blue arrow) representing an apple-like shape placed on a cup.
- The convexity of the lunate articulates with the intra-articular surface of the distal radius. This articular surface of the radius represents a saucer.
- Hence, if there is any misalignment of this vertical linear articulation of the three bones, and the cup (lunate) appears empty (green circle and blue arrow) a dislocated lunate is the most likely diagnosis, and best demonstrated on a lateral projection of the wrist.

## CASE 8

An 8 year old male patient, with a history of trauma to the distal radius and ulna presents to the trauma radiography unit. You are requested by the attending medical practitioner to perform a radiographic examination of the right forearm. Figure 8 represents the resultant radiographic images obtained, what is the probable diagnosis? Give reasons for your answer.

### Answer



Figure 8 demonstrates a buckle or Torus fracture of the distal radius.

- On the AP projection, bilateral cortical width diameter enlargement (purple arrow) is noted (red circle), with a transverse fracture line, not breaching the cortex (green arrow).
- On the lateral projection, the posterior cortex of the distal radius appears irregular (purple arrow), and a transverse fracture line seen (green arrow).
- The fracture does not demonstrate any displacement.
- The rest of the forearm, and elbow joint appears to be normal.