Abdominal Imaging Update

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Objectives

- Review selected radiological abdominal studies.
  - CT Colonography
  - Rectal MRI
  - Small bowel Imaging
  - Liver Imaging.
- Discuss limitations, advantages and patient tolerability.
- Discuss how radiologists can help.
- Dispel some myths about MRI.

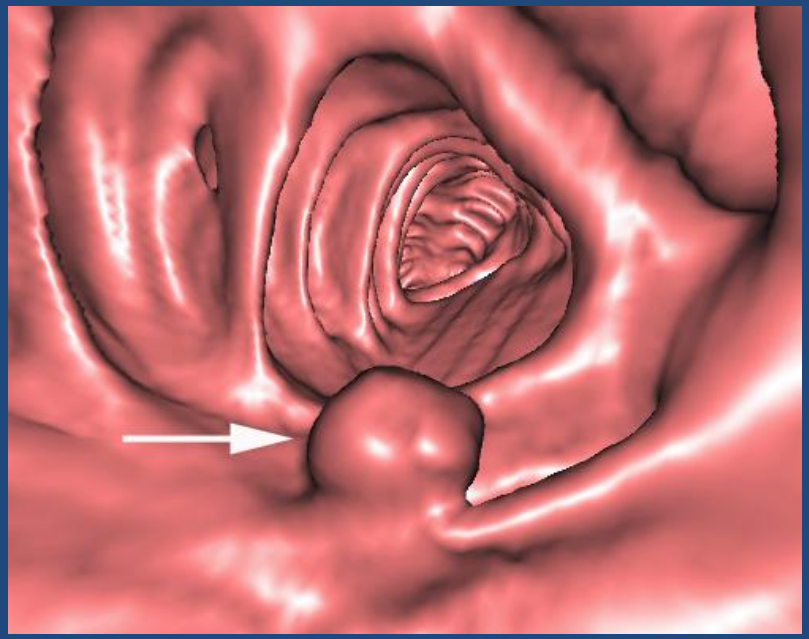
CT Colonography

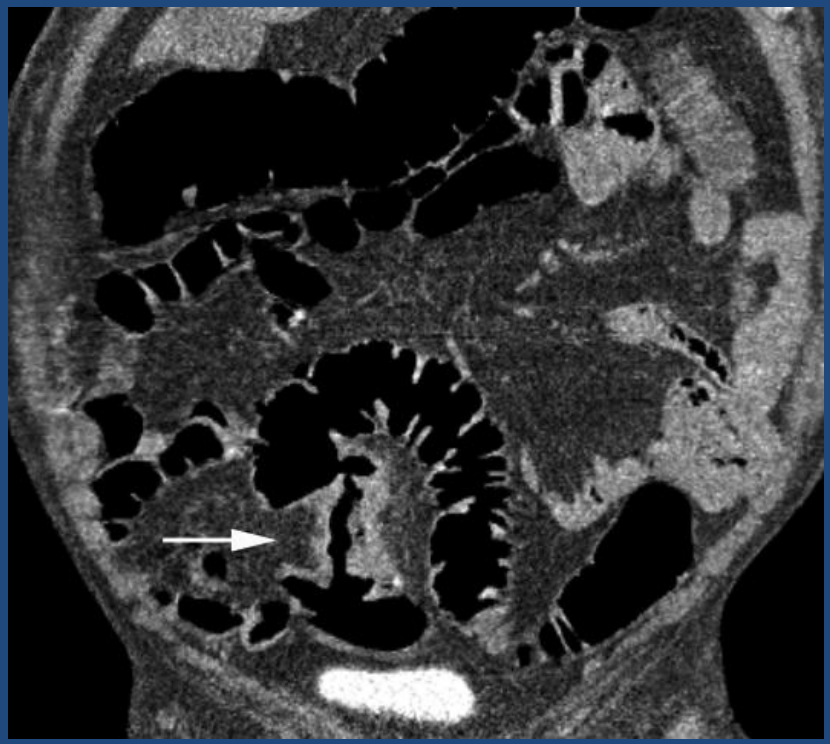
- ‘virtual colonoscopy’.
- Indications
  - Investigation of iron deficiency anaemia/positive FOB
  - Incomplete optical colonoscopy
  - Patients unsafe for colonoscopy
- Contraindications
  - Active colitis/diverticulitis
  - Recent biopsy or colon surgery

CT Colonography

- CT colonography (CTC) is as accurate as optical colonoscopy for detecting meaningful polyps [1].
- Well tolerated
- Requires full bowel prep
- Cannot perform polypectomy.

- 1. Pickhardt et al, *Computed Tomographic Virtual Colonoscopy to Screen for Colorectal Neoplasia in Asymptomatic Adults, NEJM 2003,* 349(23):2191-2200





Advanced Histology

- an adenoma with villous or serated histology, high grade dysplasia or an invasive cancer.
- Related to polyp size [1].
  - 1-5mm → 1.7%
  - 6-9mm → 6.6%
  - >10mm → 30.6%
- 1. Lieberman D, Polyp Size and Advanced Histology in Patients Undergoing Colonoscopy Screening: Implications for CT Colonography, Gastroenterology 2008;135:1100-1105

Alternative Tests

- CT with water enema.
- Standard portal venous CT.

CT Colon Summary

- In a palliative setting, CT colonography is “relatively” invasive aka shock and awe.
- Portal venous CT +/- water enema will show most polyps and masses likely to be of clinical significance.
- Use faecal tagging.
- Design a limited tailored colonic study with your radiologist.

Question 1

- Q. Contrast enhanced MRI should not be performed in patients with renal impairment because contrast agents are nephrotoxic?
- A. False.
- Gadolinium agents are not nephrotoxic.
- Nephrogenic systemic fibrosis (NSF) is a potential complication.

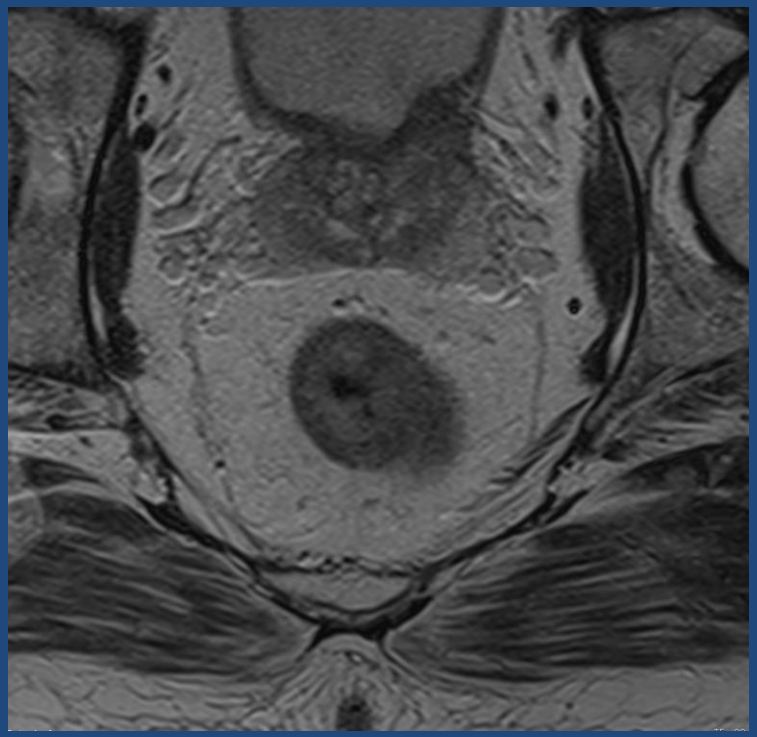
Rectal MRI

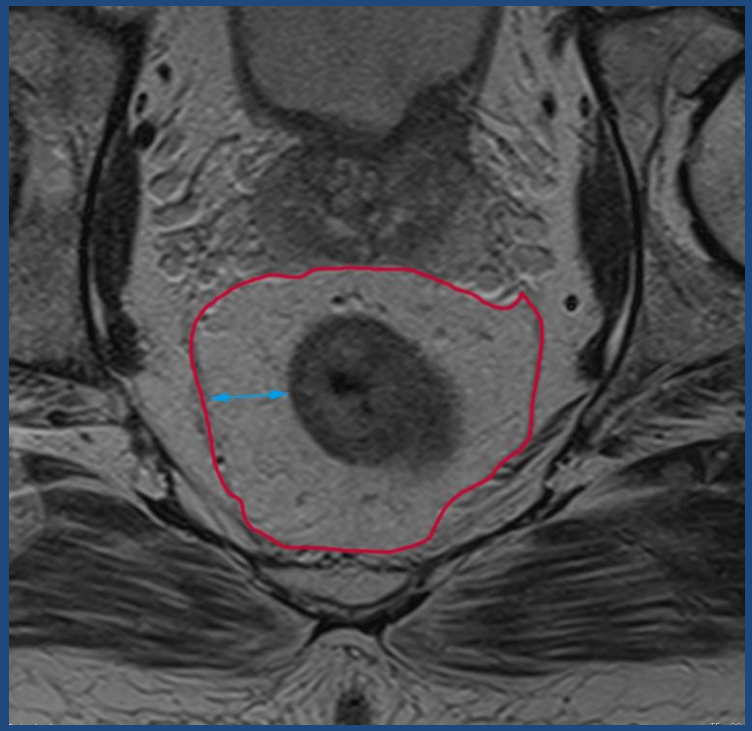
- Performed for the local staging of rectal cancer.
- No prep required and no contrast.
- Aim to differentiate T2 from T3 and T4.
- Identify nodes
- Identify vascular invasion.

Rectal MRI

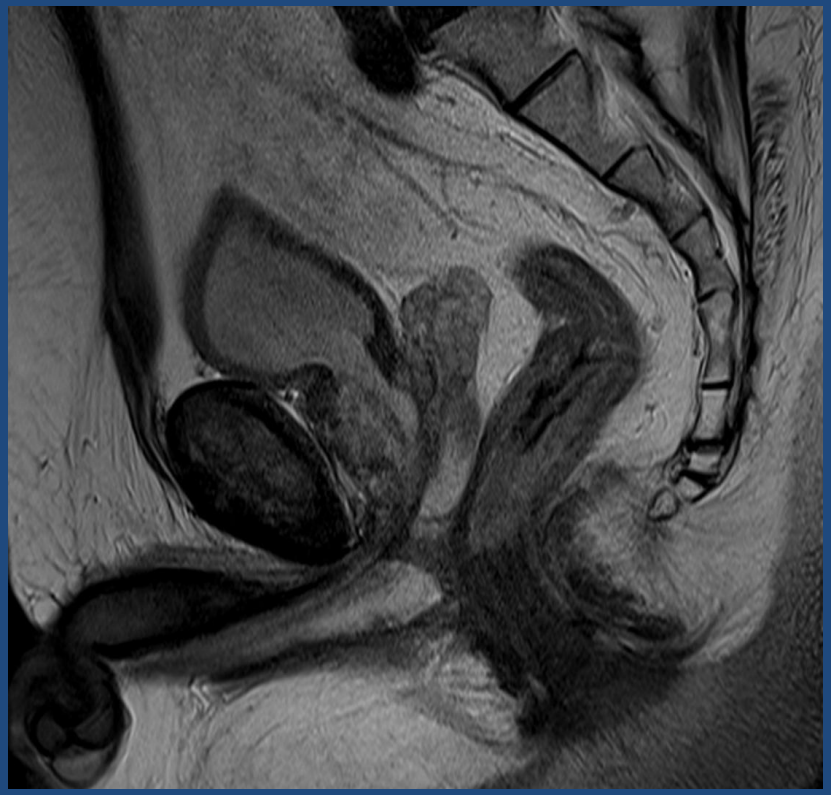
- Circumfrential resection margin (CRM).
- Mesorectal fascia.
- Location - high, mid, low rectal.
- Location – clock face.

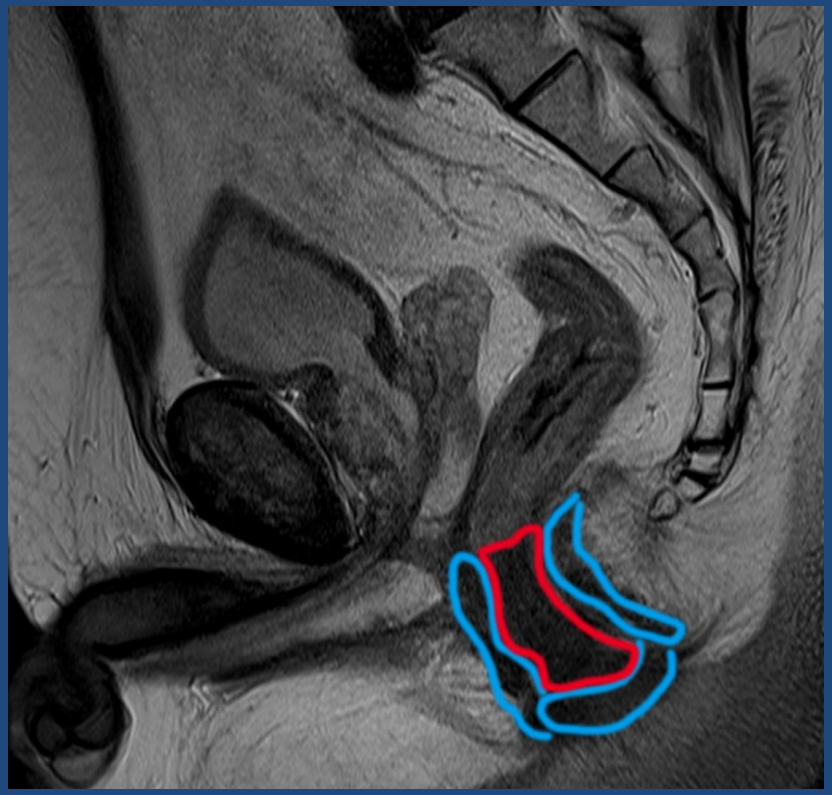
Anatomy

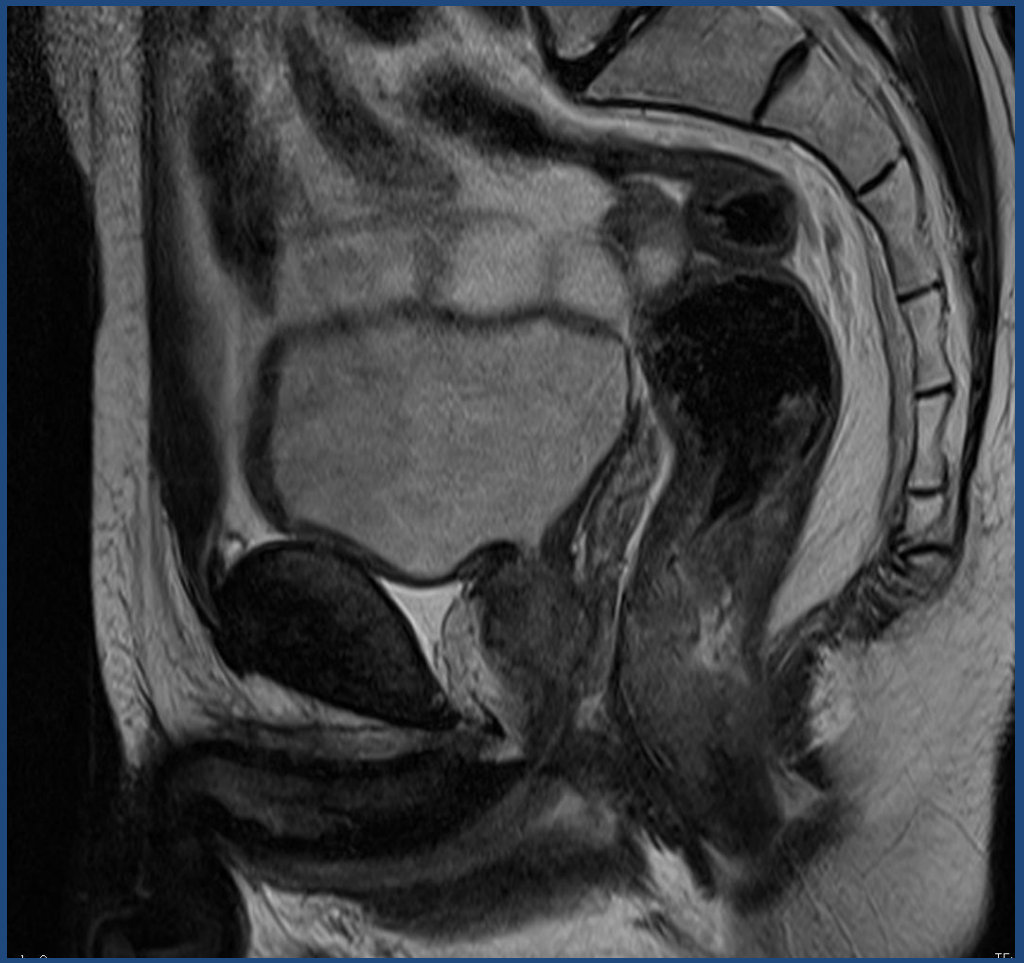


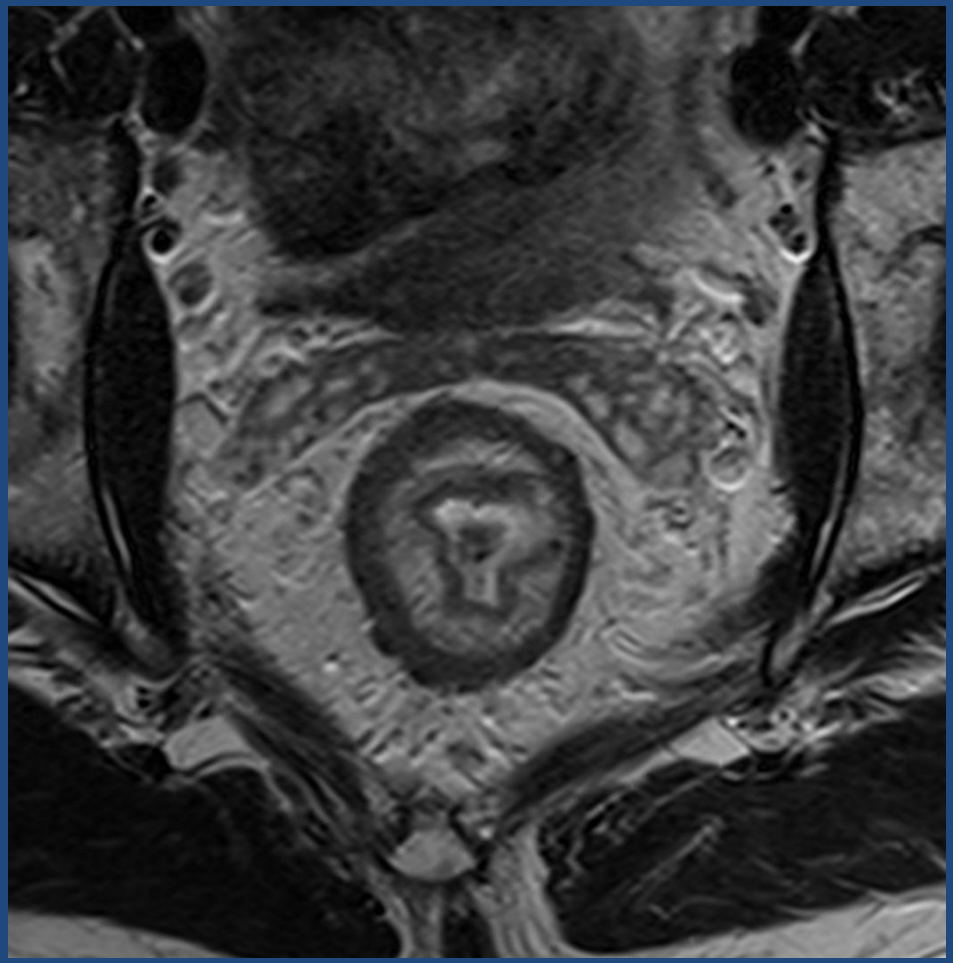


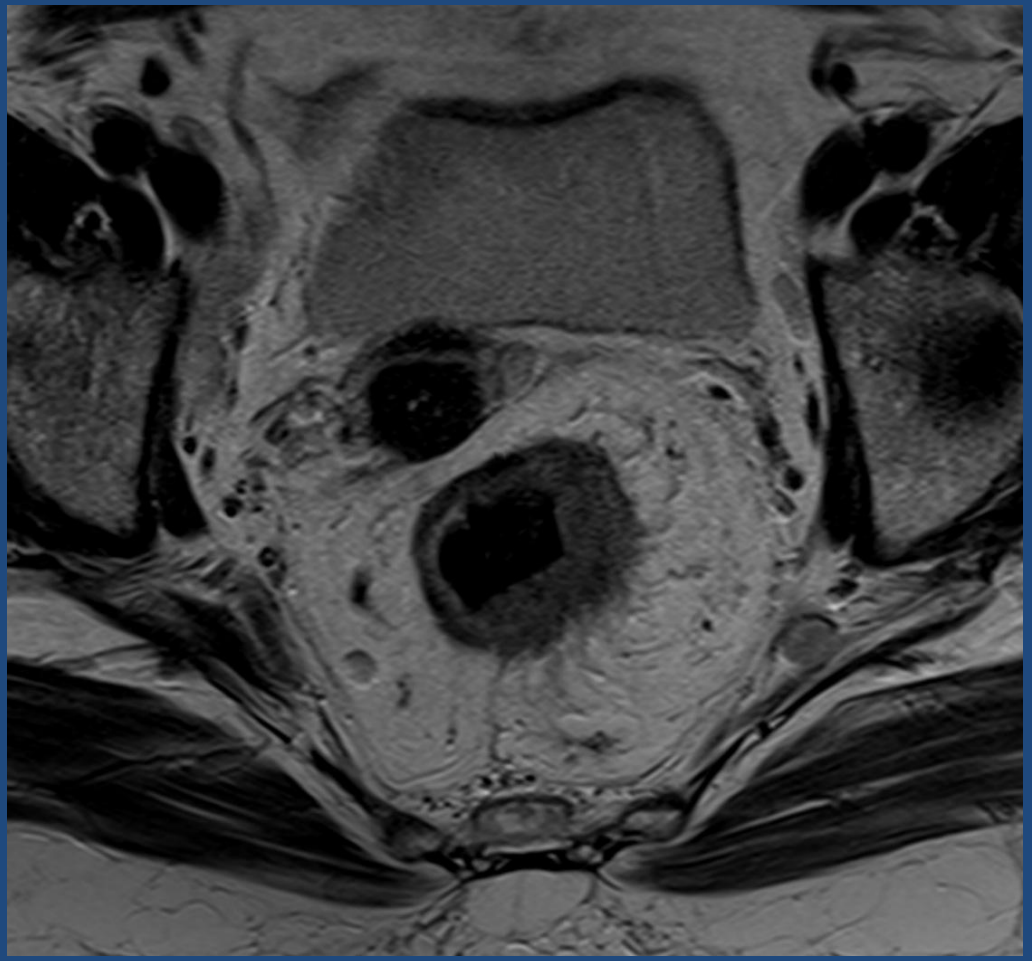
Anatomy

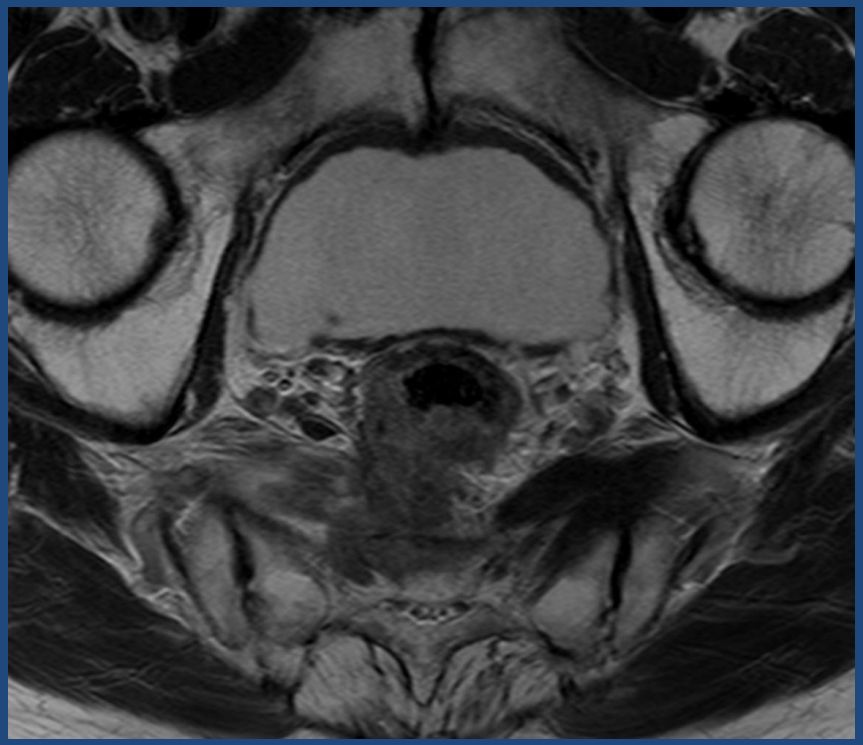


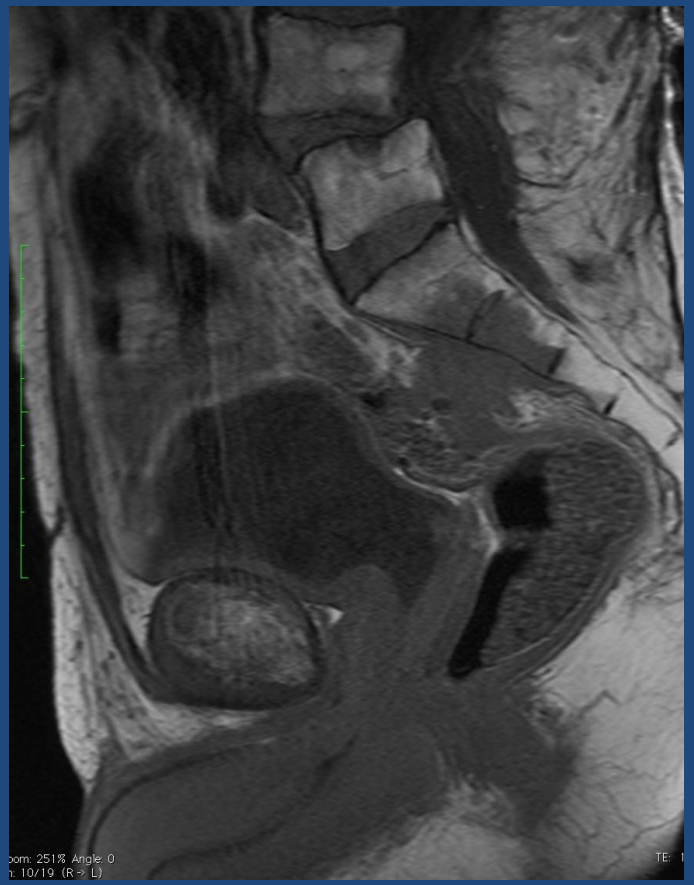








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Rectal MRI Summary

- Identify patients with poor prognostic signs.
- Identify patients requiring preop chemo radiation.
- Identify patients who will need a permanent stoma.

Question 2

- Q. Patients with shrapnel, cerebral aneursym clips and pacemakers are unsafe for MRI?
- A. False
- Some modern PPM are MRI compatible (most models are contraidicated).
- Safety of shrapnel depends on location relative to what we are scanning (most are safe)
- An MRI database lists all surgical implants for safety factors.

Small Bowel Imaging

- MRI
- CT
- Small bowel follow through
- Ultrasound
- Pill cam
- Double balloon push enteroscopy.

Small Bowel CT and MRI

- Enterography vs Enteroclysis.
- Oral contrast choice – positive, negative, biphasic.
- 4 hour fast for CT
- 8 hour fast MRI

Small Bowel CT and MRI

- CT
  - Quick, freezes motion.
  - High spatial resolution.
  - Accessible.
  - Well tolerated.
  - Cheap.
- MRI
  - Slow.
  - Multiple time periods.
  - High soft tissue resolution.
  - Generally well tolerated (best to lie prone).

Small Bowel Summary

- CT enterography will answer most questions.
- Avoid enteroclysis.
- Small bowel MRI as a problem solving tool.

Question 3

- Q. Patients with claustrophobia can be given intravenous sedation for abdominal MRI studies?
- A. False.
- Most studies require patient cooperation with breath holding. They need to be awake.
- Can try them with oral sedation.

Liver MRI

- Two major recent advances:
  - Hepatobiliary contrast agents (HBCAs).
  - Diffusion weighted imaging (DWI).
- Both assist with lesion detection and characterisation.

HBCAs

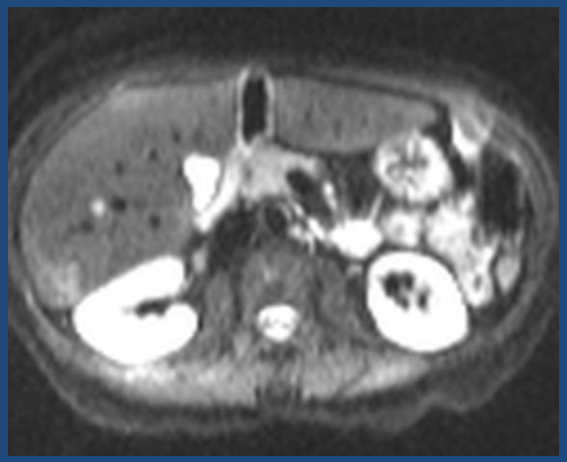
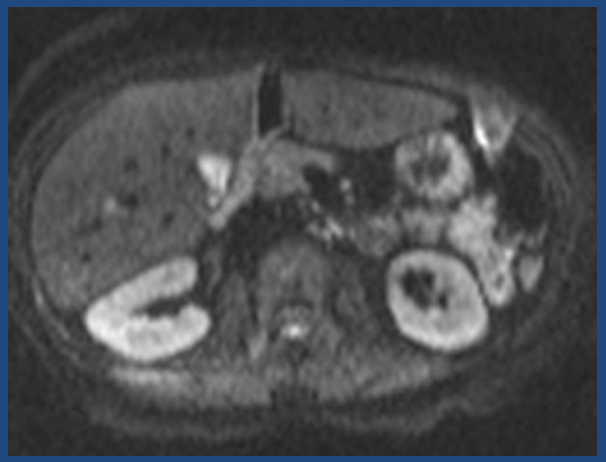
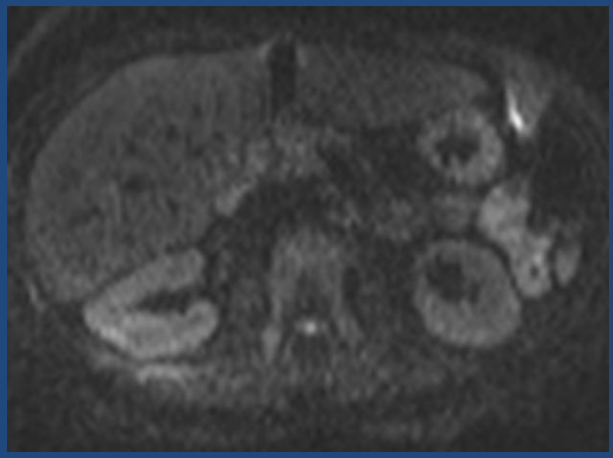
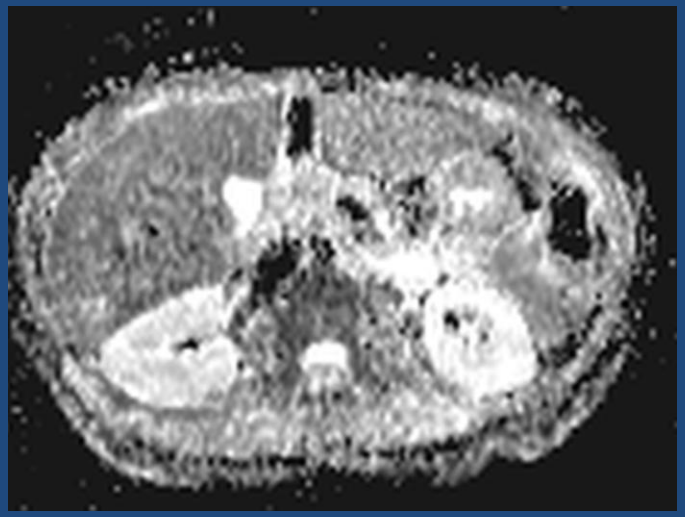
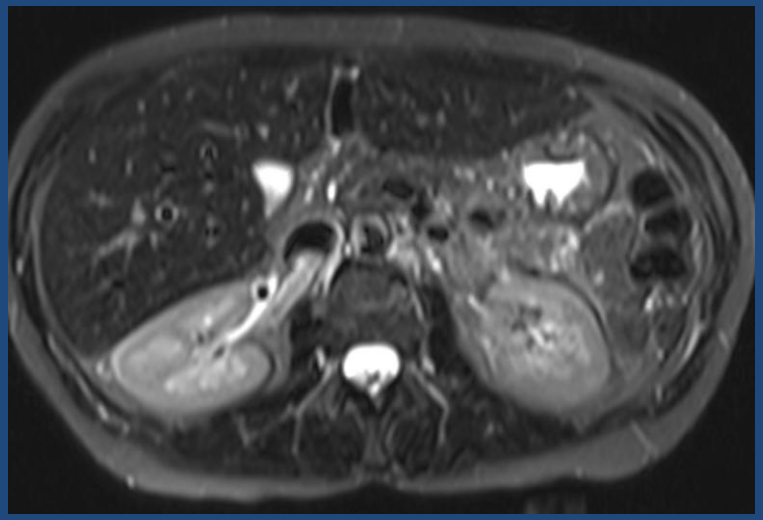
- 2 agents in Australia and NZ
  - Primovist - gadoxetic acid
  - Multihance - gadobenate dimeglumine
- Allow anatomical and functional imaging.

DWI

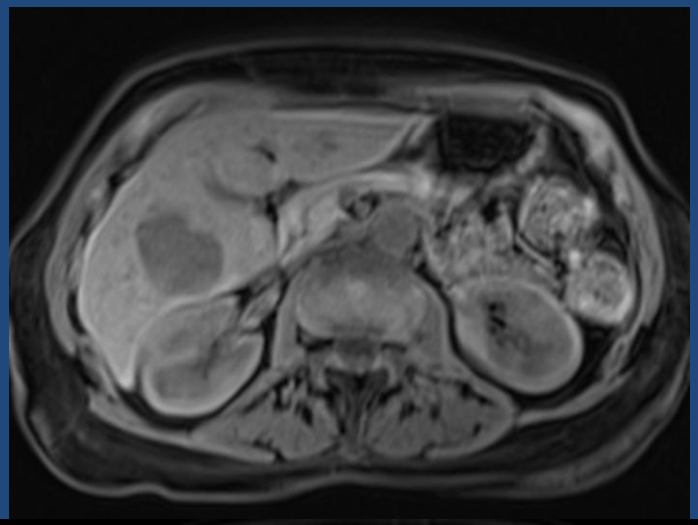
- Signal depends on rate of diffusion.
- Excellent for lesion detection.
- By itself it is poor at lesion characterisation.
- DWI and HBCAs together are excellent for detection and characterisation [1].

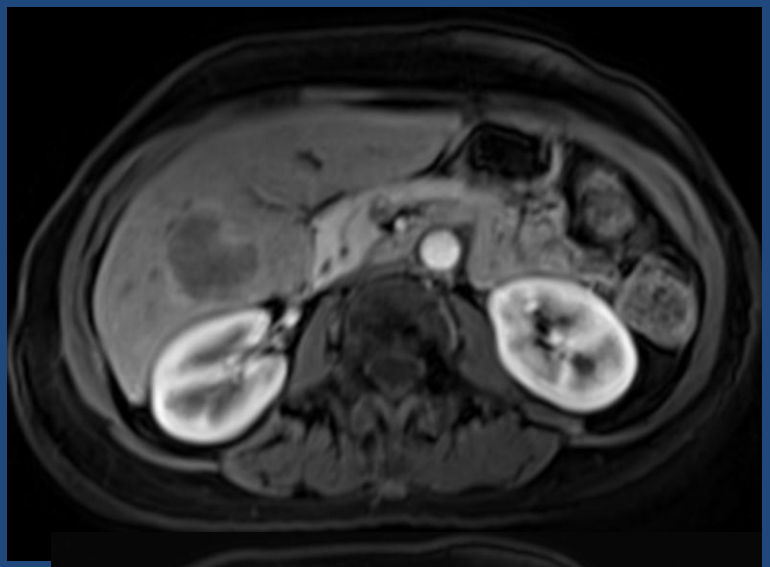
- Holzapfel K, et al, abdominal imaging 2012;37:74-82

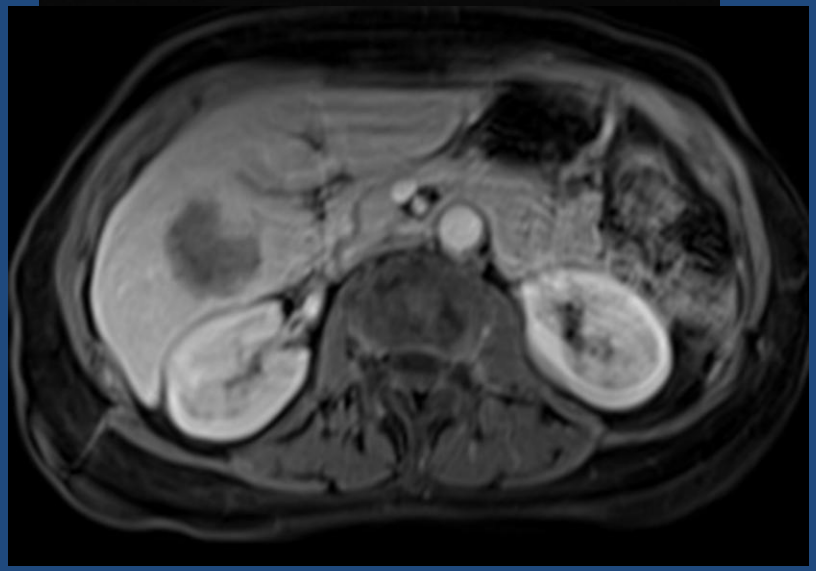
DWI detection

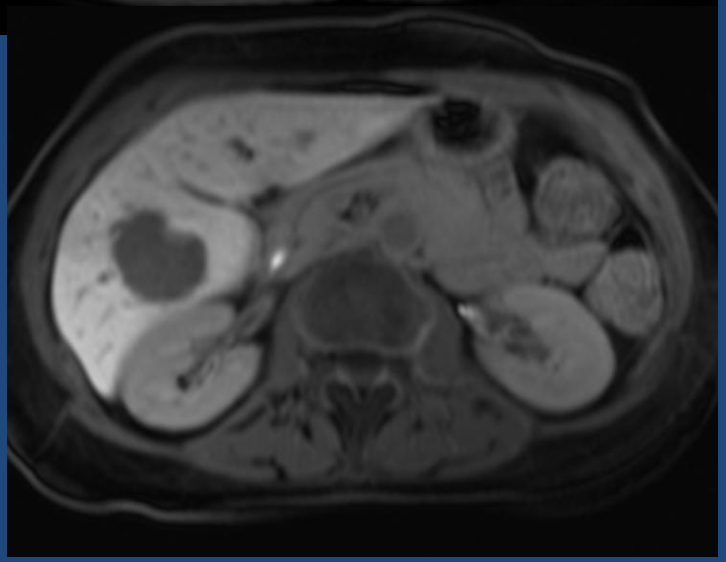






Mets - CRC

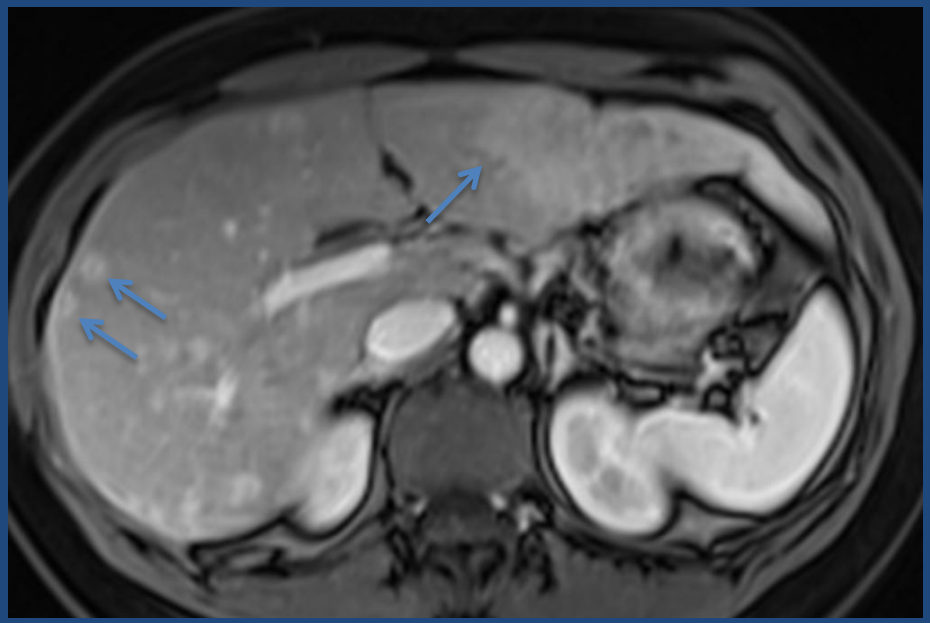


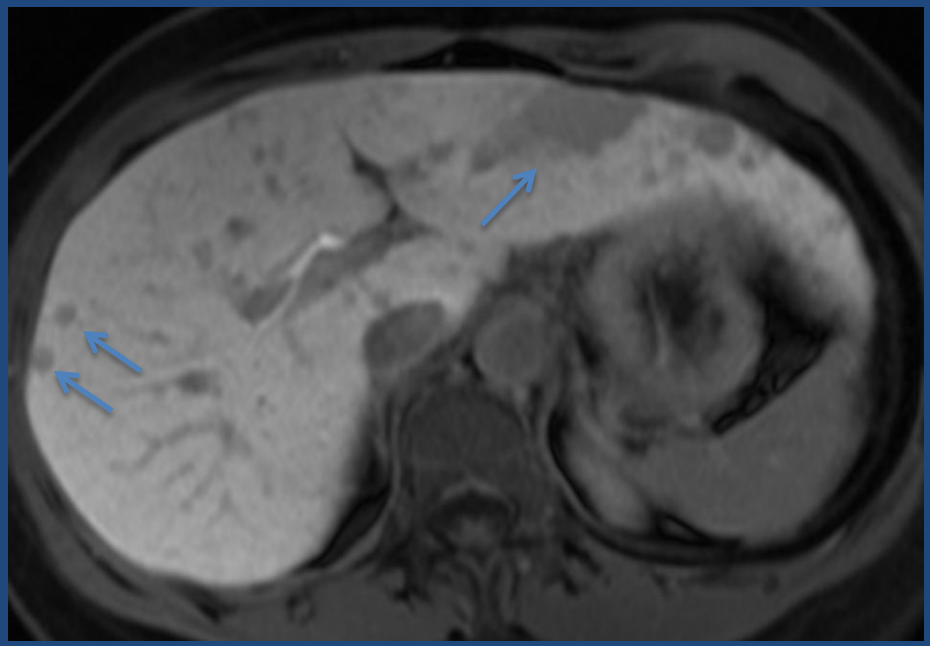






Metastatic Disease – Breast Ca





Liver MRI Summary

- Excellent at identifying and characterising disease.
- Expensive.
- Report probably won't identify 'symptomatic lesions'.

Question

- Q. Radiologists like to work in isolation.
- A. False.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INTEREST
IN PEOPLE


WEDNESDAY
NOVEMBER 28, 2012
RSNA 2012
Daily Bulleti
Images Don't Reveal Patient's Whole Story
From basic X-rays to ultrasound, CT and MR imaging, physicians rely on radiology to answer some of their most fundamental questions: Does my patient have a pathologic lesion? If so, what is it likely to be? How far has the process spread and what complications have ensued? Is the patient responding to treatment?
"Just as referring physicians need radiology results to be going on with the patient, so radiologists need to be the patient in order to fully understand the radiology
Richard Gunderman, M.D., Ph.D.

Summary

- Rapid advances in imaging.
- Provide a clinical question.
- For best results have a relationship with your radiologist.
- Call us or visit.