Liverpool University Hospitals
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Magnetic Resonance Imaging for the investigation of acute abdominal/pelvic pathology in pregnancy: 9-year single centre experience

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Background

- Acute abdominal and pelvic presentations are common in pregnancy [1]
- Diagnosing and treating this can be challenging due to distorted anatomy and non-specific biochemical changes such as raised white cell count[2]
- In atraumatic settings, an ultrasound scanning is often used as the first line radiological test due to ease of access and risk of ionising radiation. However, the accuracy of ultrasound is variable, becoming particularly more difficult as the foetus grows. [3]
- MRI has better reported accuracy - e.g for acute appendicitis, sensitivity is 92% and specificity 98% [4]. MRI may be more difficult to perform in the emergency setting, however, due to limited access, particularly out of hours and because of patient tolerance [2,3,4,5]

Aims

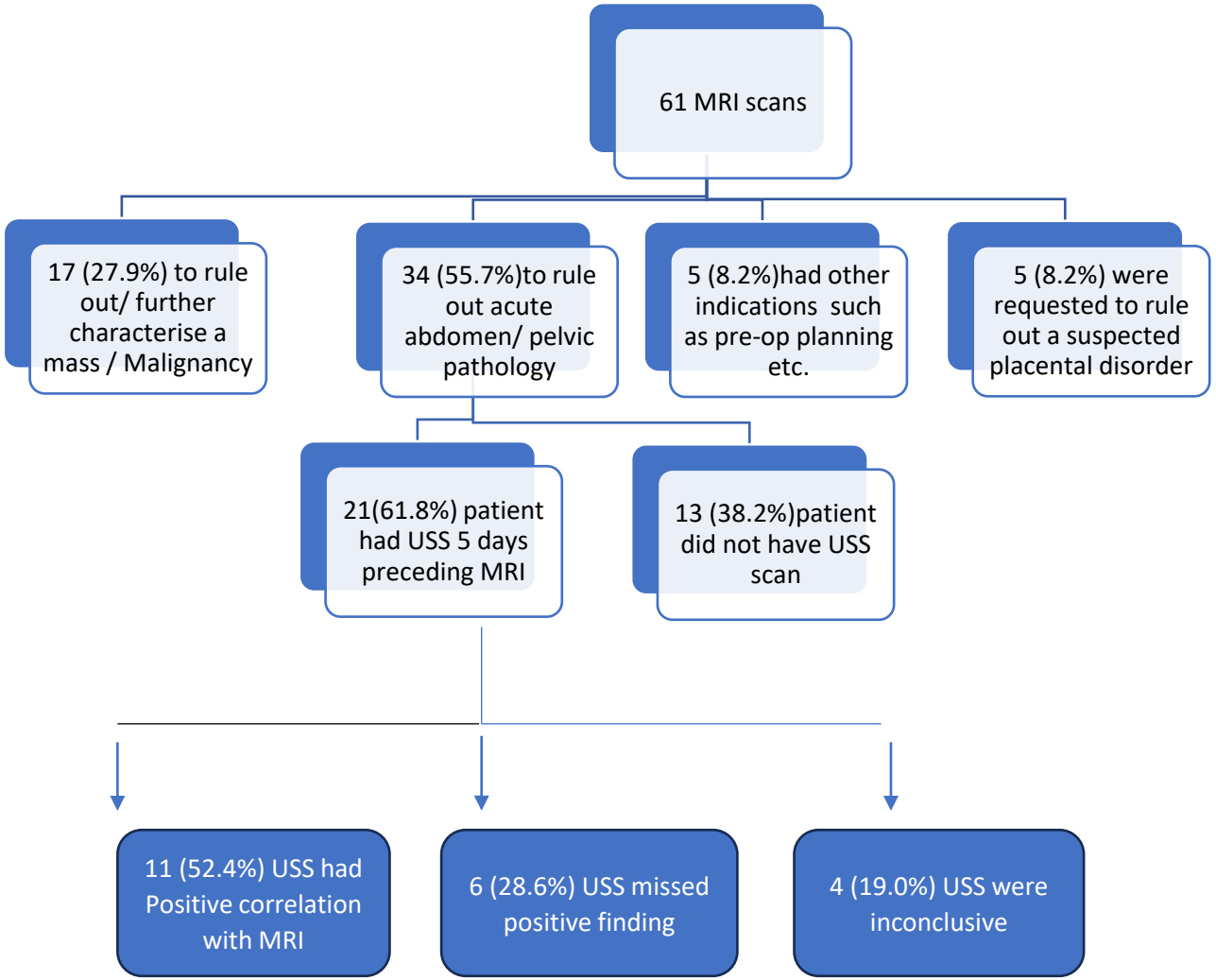
A retrospective service evaluation to determine:

- How often MRI scans detected pathology and the pathologies detected in atraumatic cases
- How the MRI findings compared to ultrasound findings (if performed)
- Patient outcomes

Method

Initial search	A search was performed of the radiology information system (RIS) with the following criteria: MRI scans with codes: MPEGY, MOBST, MABDO, MUROG Including words/phrases in the text of the report which could indicate pregnancy: pregnant, pregnancy, /40, EDD.
Filtering	Data from 1st August 2014 to 1st August 2023 was filtered manually by reading the clinical information to exclude non-pregnant women at the time of MRI.
Checking for Indication	Checked each request for the indication and this was placed into four categories.
Acute Indications	The RIS record of each included patient was then reviewed to determine if the patient underwent ultrasound scan of the abdomen or pelvis in the 5 days preceding the MRI scan for the same indication.
Analysis	Analysed the correlation between USS and MRI findings and categorised the different diagnoses and clinical outcomes.

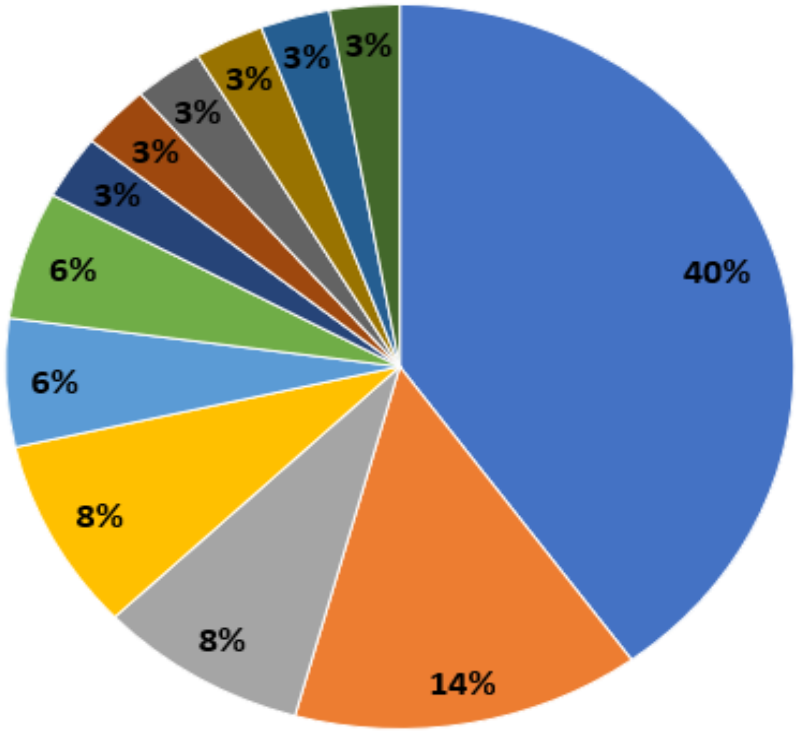
Results


61 MRI scans
17 (27.9%) to rule out/ further characterise a mass / Malignancy
34 (55.7%)to rule out acute abdomen/ pelvic pathology
5 (8.2%)had other indications such as pre-op planning etc.
5 (8.2%) were requested to rule out a suspected placental disorder
21(61.8%) patient had USS 5 days preceding MRI
13 (38.2%)patient did not have USS scan
11 (52.4%) USS had Positive correlation with MRI
6 (28.6%) USS missed positive finding
4 (19.0%) USS were inconclusive

Results

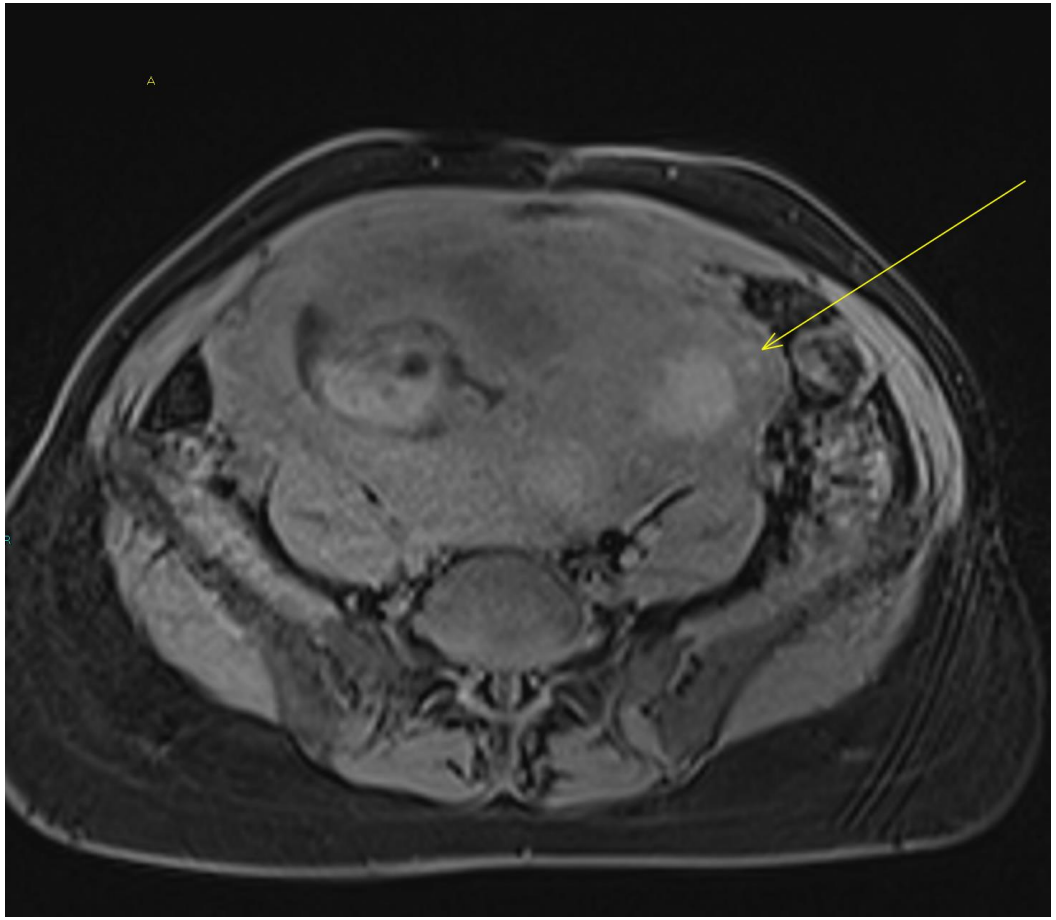
Mean age	Mean gestation
29.3 years	21.1 weeks
Youngest patient	**Youngest gestation**
17 years	6 weeks
Oldest patient	**Oldest gestation**
46 years	39 weeks

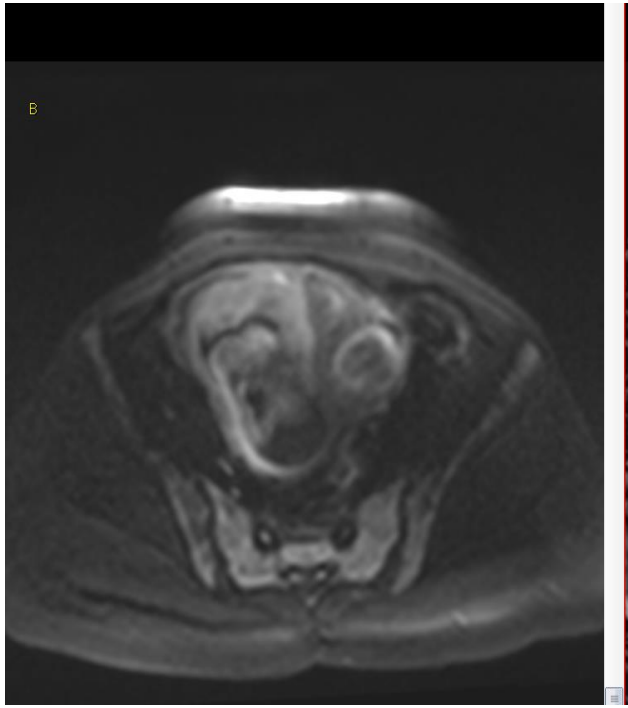
MRI diagnoses

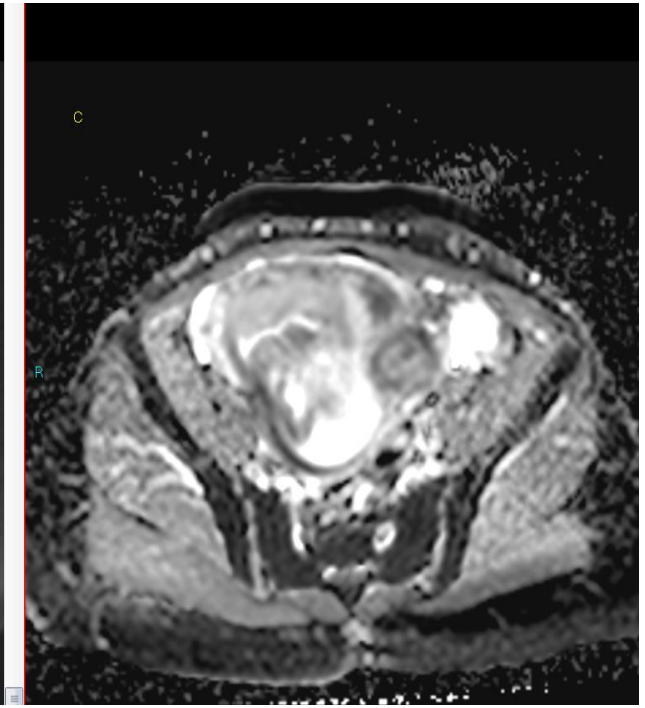


- Normal - 14
- Degenerating fibroid - 5
- Bowel obstruction - 3
- Patient did not tolerate - 3
- Appendicitis - 2
- Adnexal torsion - 2
- Pyelonephritis - 1
- Pancreatitis - 1
- Diverticulitis - 1
- Ovarian malignancy - 1
- Subchorionic haemorrhage - 1
- Hydronephrosis - 1

MRI scan of a pregnant woman with acute abdominal pain from degenerating fibroid.
A. T1 vibe axial image showing a hyperintense focus within the fibroid mass.
B and C are axial DWI and ADC images showing restricted diffusion in the same area.

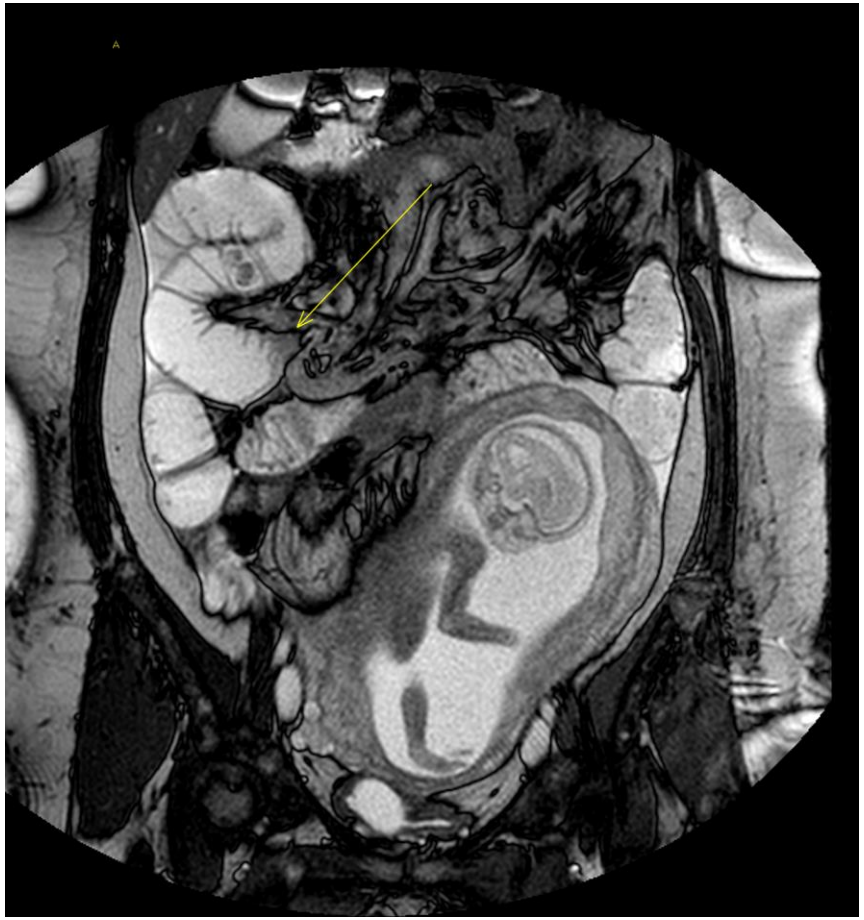




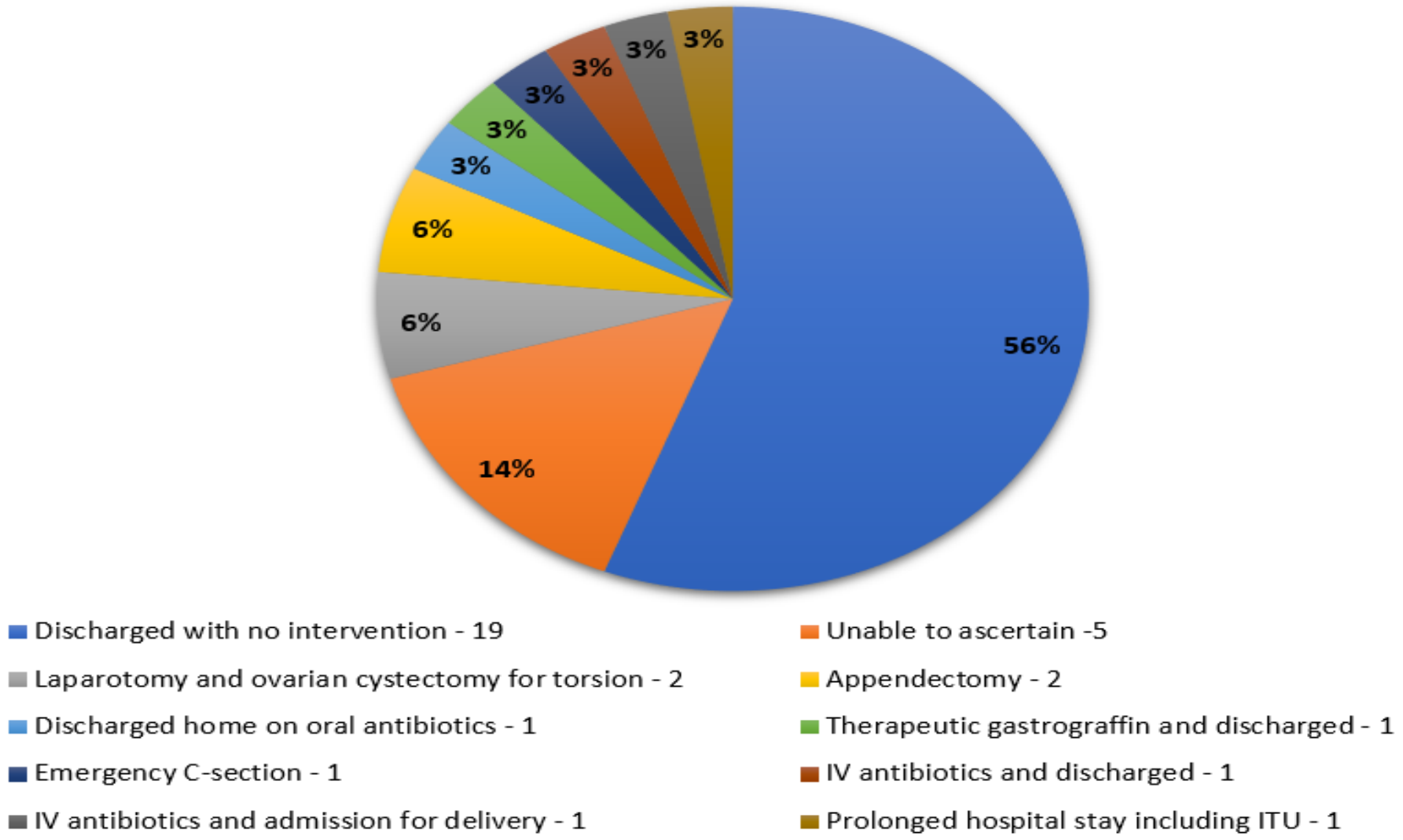


MRI scan of a pregnant woman with acute abdominal pain from small bowel obstruction secondary to an acute angulation in the right lower abdominal quadrant likely from adhesions.

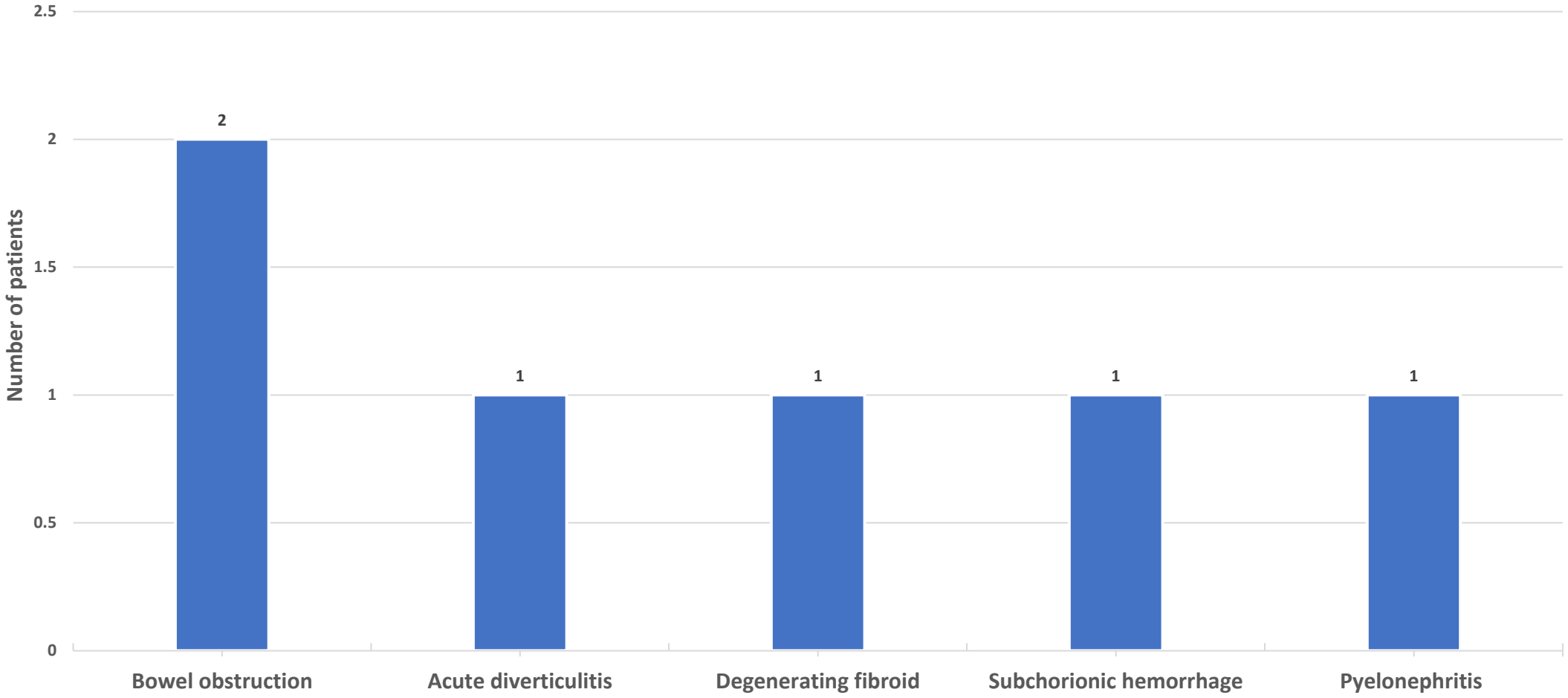
A. T2 coronal image showing dilated ileal loops and a transition point.
B. T2 axial image showing dilated small bowel loops.



Clinical outcomes



Ultrasound missed diagnoses



Summary

- 21 out of 34 patients (62%) had USS before MRI
- In 29% of patients who underwent ultrasound, MRI detected pathology that was not seen on ultrasound
- 40% of MRI scans were reported as normal.
- Over half the patients (56%) were discharged without any intervention as symptoms improved.
- The largest positive finding was ‘Degenerating fibroid’ which accounted for 14% of diagnoses.

Conclusion

- MRI findings are often normal when investigating acute abdominal/pelvic pathology in pregnancy.
- Imaging findings are varied including GI tract, urological and gynaecological causes and this should be borne in mind when protocolling and reporting these studies.
- The majority of patients did not require intervention and had good clinical outcomes.
- In patients who had USS first, MRI often added additional information which can help in distinguishing the cause of symptoms if they still persist despite a negative USS.

References

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