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# Visualisation of the fetal bowel on post mortem magnetic resonance imaging scans

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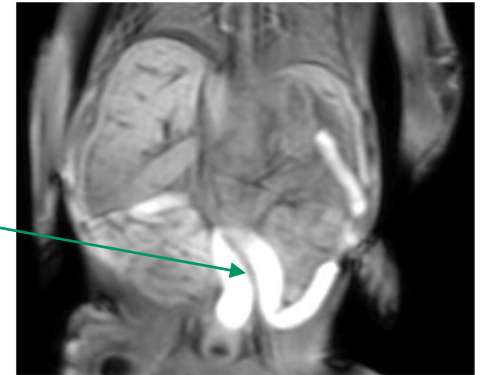
# Background

- MRI is being increasingly used for non-invasive fetal post mortems<sup>1</sup>
- Focus on nervous and cardiovascular systems<sup>2</sup> – limited information on other body systems
- Bowel abnormalities are a significant cause of neonatal morbidity<sup>3</sup>
- Need to validate normal appearance of gastrointestinal organs

# Objective

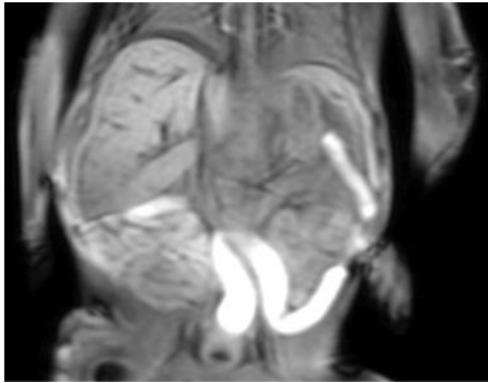
- To investigate the appearance of the fetal bowel at post mortem MRI
  - Range of gestational ages
  - Using hyperintense appearance of meconium on T1 weighted MRI

Appearance of fetal bowel on  
post mortem MRI

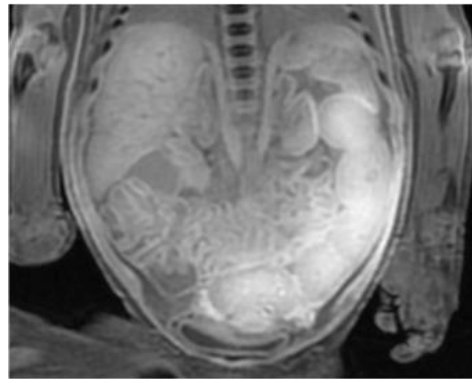


# Method

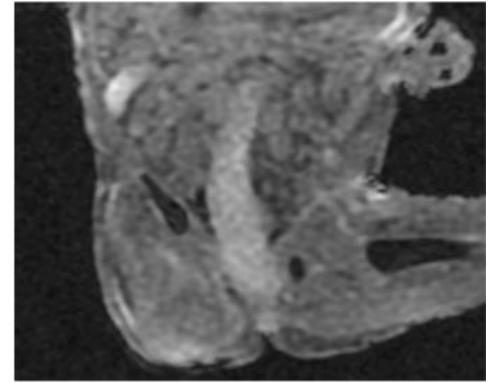
- 62 fetal post mortem T1 MRI scans (viewed on PACS)
- Between 12-41 weeks gestation
- Retrospective review from Jan 2014-May 2018
- Signal intensity of meconium at rectum, sigmoid colon, splenic flexure and hepatic flexure observed and the small bowel
- Signal correlated with gestational age.



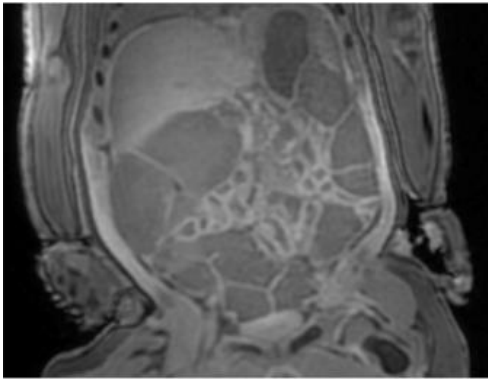
1: Bright white



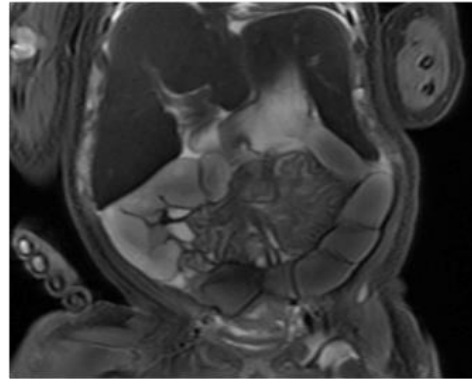
2: White



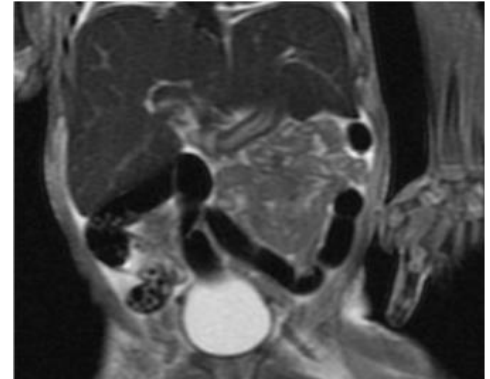
3: Light grey



4: Mid grey



5: Dark grey

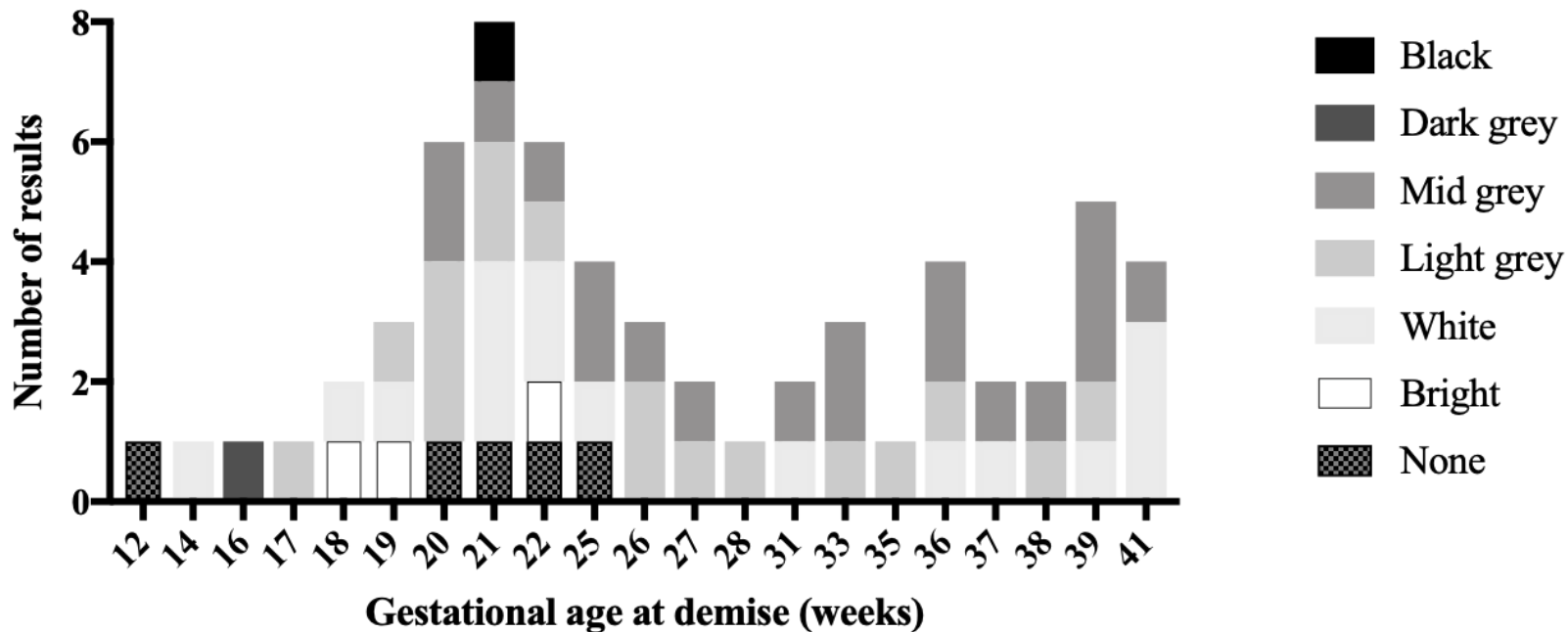


6: Black

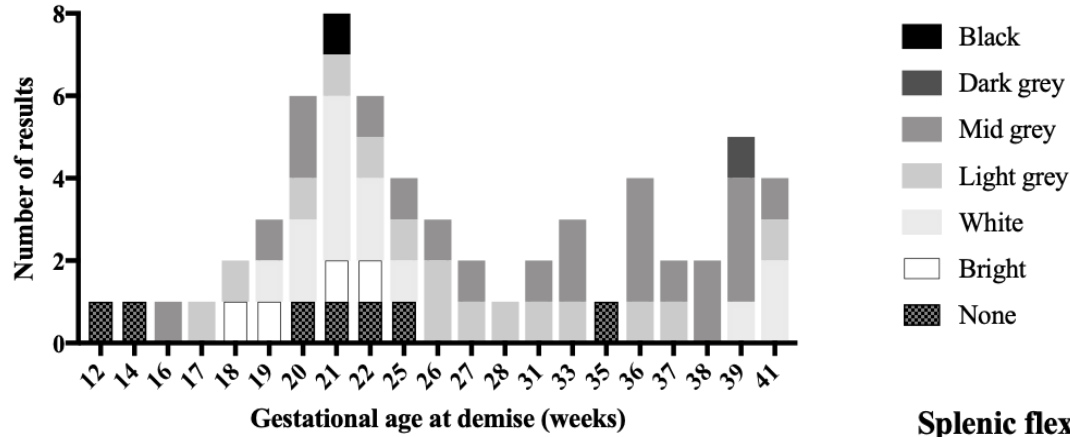
# Results

- No obvious presence of meconium on many scans
- Less consistent high intensity than antenatal meconium
- Rectum had highest signal intensity
- More proximal bowel = lower signal intensity
- 15 dilated bowels, all later gestations.

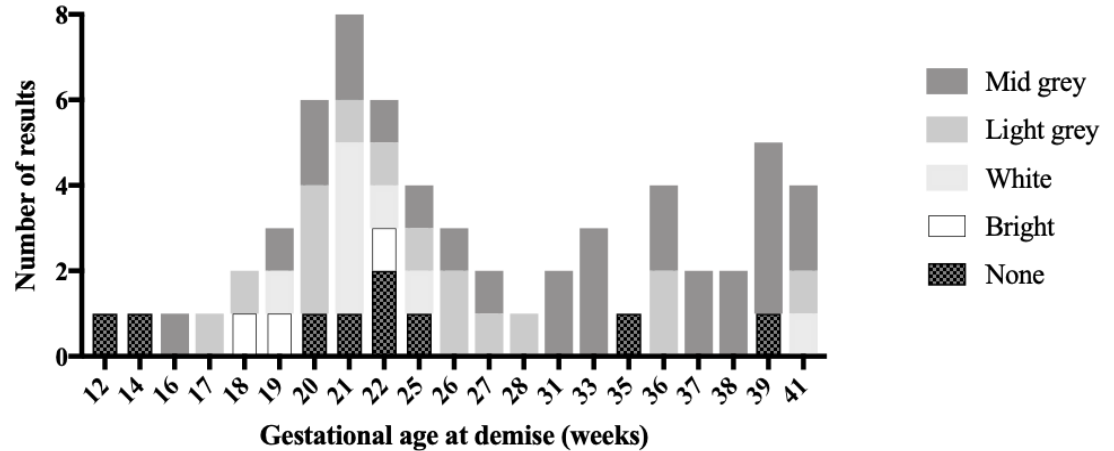
## Rectum signal intensity - T1 images



### Sigmoid colon signal intensity - T1 images

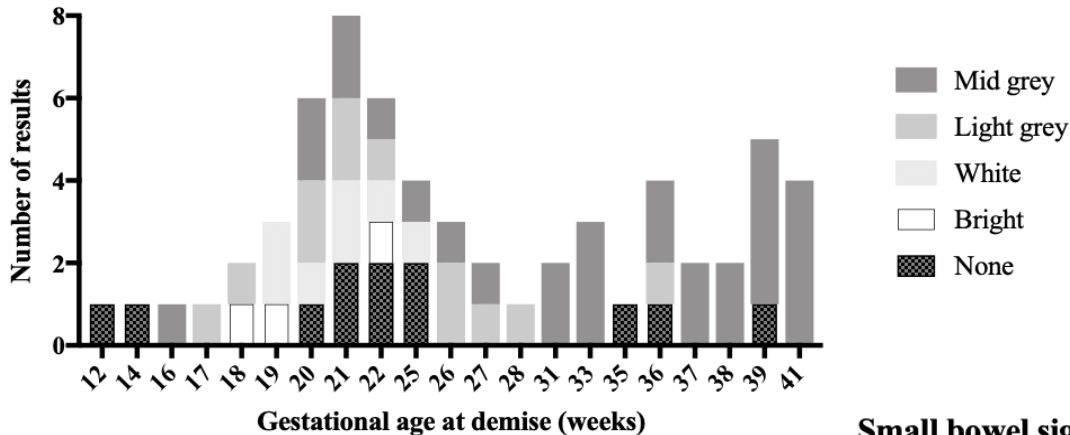


### Splenic flexure signal intensity - T1 images

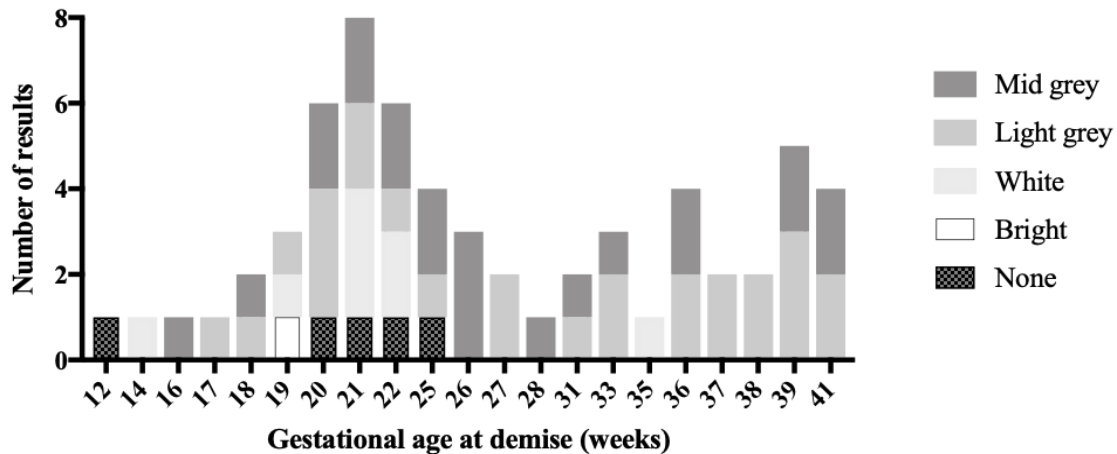




### Hepatic flexure signal intensity - T1 images



### Small bowel signal intensity - T1 images



	White	Grey	Dark
Rectum	30.65%	58.06%	3.23%
Sigmoid	27.42%	58.06%	3.23%
Splenic flexure	17.74%	67.74%	0.00%
Hepatic flexure	16.13%	64.52%	0.00%
Small bowel	14.52%	77.42%	0.00%

- Amalgamated groupings of signal intensity
- Increase in signal intensity with increasing distal location in the bowel.

# Conclusions

- First primary research on appearance of fetal bowel on post mortem MRI
- Variable results
- Alteration in bowel contents after death?
- Further investigation needed to inform practice.

# References

- 1- Manganaro L, Antonelli A, Bernardo S et al. Highlights on MRI of the fetal body. *La Radiologia Medica*. 2018;123:271–285.
- 2- Whitby EH, Paley MNJ, Cohen M, Griffiths PD. Post-mortem fetal MRI: What do we learn from it? *European Journal of Radiology*. 2006;57:250–255.
- 3- Berrocal, T., Lamas, M., Gutierrez, J., Torres, I., Prieto, C., del Hoyo, M. L. Congenital Anomalies of the Small Intestine, Colon and Rectum. *Radiographics*. 1999;19:1219-1236.