

**Initial experience of fetal MRI as adjunct to fetal echocardiography for cardiac tumours tissue characterisation**

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Introduction: Fetal echocardiography has been the standard imaging modality for detecting fetal cardiac tumours. The availability of ultra-fast MRI sequences has enable visualisation of cardiac structures in-utero. Tissue characterisation of cardiac tumours using cardiac MRI in paediatric population is established however the use of MRI for characterising fetal tumours is not well described.

Methods: Cases of fetal cardiac tumours were referred for MRI. Fetal echocardiography for each case was reviewed. Fetal MRI (figure) was performed on a Siemens 1.5T scanner. Following localisers in 3 standard planes, diagnostic imaging was performed using single-shot T2W turbo spin echo (HASTE), T1W fast low-angle shot gradient echo (FLASH) and balanced SSFP (bSSFP) sequences.

Results: 3 fetal cardiac tumour MRI was performed this year, at mean gestation age (GA) of 26 weeks (23 – 29 weeks). All 3 fetuses had suspected cardiac tumours on fetal echocardiography. The tissue characteristics of the mass were assessed based on T1, T2 and bSSFP signal characteristics. Following the MRI, one pregnancy was terminated and two fetuses were delivered alive.

| Case | GA (weeks) | Termination of pregnancy | Fetal MRI diagnosis | T1   | T2                   | bSSFP                | Postnatal / Postmortem diagnosis |
|------|------------|--------------------------|---------------------|------|----------------------|----------------------|----------------------------------|
| 1    | 27         | No                       | Rhabdomyoma         | iso  | Mildly hyper         | iso                  | Rhabdomyoma                      |
| 2    | 23         | No                       | Likely Teratoma     | Hypo | Hyper                | Mildly hyper         | Possible lipoma                  |
| 3    | 29         | Yes                      | Likely Teratoma     | Hypo | Mixed hypo and hyper | Mixed hypo and hyper | Teratoma                         |

Conclusions: Our preliminary experience suggests that fetal MRI may be a useful adjunct in tissue characterisation of fetal cardiac tumours however it may not always be possible to be definitive of the diagnosis. Future adjustment of sequences may allow further tissue differentiation of cardiac tumours on MRI.

