

[EP06.73] Retrospective Analysis of Late Fetal and Neonatal Brain MRI:A Single Tertiary Care Centre Study

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Introduction

MRI of the fetal and neonatal brain is used as an adjunct to antenatal neurosonography due to excellent contrast and spatial resolution, permitting detailed anatomical evaluation and added diagnostic accuracy.

Aim

To compare the quality of late third trimester fetal with neonatal MRI to determine:

- 1) Scan quality and
- 2) Any discrepant findings which may aid clinical management

Methods

Four year (2022-2025) retrospective comparison of late fetal (>30 weeks) with neonatal MRI (</=28 days)

Scan quality was graded by 3 expert paediatric and fetal consultant neuroradiologists

Scan quality grading included: 0=non diagnostic, 1=movement artefact with only gross pathology seen, 2=diagnostic but lacking orthogonal planes, 3=excellent and minimal motion artefact (Fig. 1)

Results:

- 1) Late Fetal MRI was performed in 70 cases, 13 of which had neonatal MRI
- 2) In these 13 cases: average fetal MRI gestational was 33 weeks (30-37), and average neonatal MRI was 15 days (1-28).
- 3) Image quality was higher in fetal MRI: score 3 for fetal (n=10,77%), vs neonatal (n=7,54%), score 2 for fetal (n=2,15%), vs neonatal (n=6,46%), and 1 for fetal (n=1, 8%), vs neonatal (n=0).
- 4) Fetal MRI identified additional abnormalities in 3 cases: ventriculomegaly, mega cisterna magna, and aqueduct stenosis (Fig. 2a,2b)
- 5) Neonatal MRI identified additional findings in 4 cases: caudal thalamic groove cysts, polymicrogyria (Yunis Varon Syndrome) delayed myelination (Fig. 3) (Kaufman Occulocerebrofacial syndrome and frontal heterotopia)

Conclusion

- Neonatal MRI had lower image quality, largely due to motion artefact
- Fetal MRI can inform immediate neonatal care and investigations
- Neonatal MRI can provide additional evolving information, particularly myelination and migrational abnormalities in genetic conditions, supporting parental counselling and prognostication.

Grade	Quality	What it means – neonatal	What it means- fetal
0	Very Poor	Non diagnostic	Non-Diagnostic
1	Poor	Movement artefact reduces image quality but gross pathology seen however heterotopia, PMG might be missed	Movement artefact or poor orientation means only gross pathology will be seen
2	Good	Diagnostic	Diagnostic but might not have orthogonal planes
3	Excellent	Excellent	Excellent, little movement, great orientations.

Fig. 1 Scan Quality

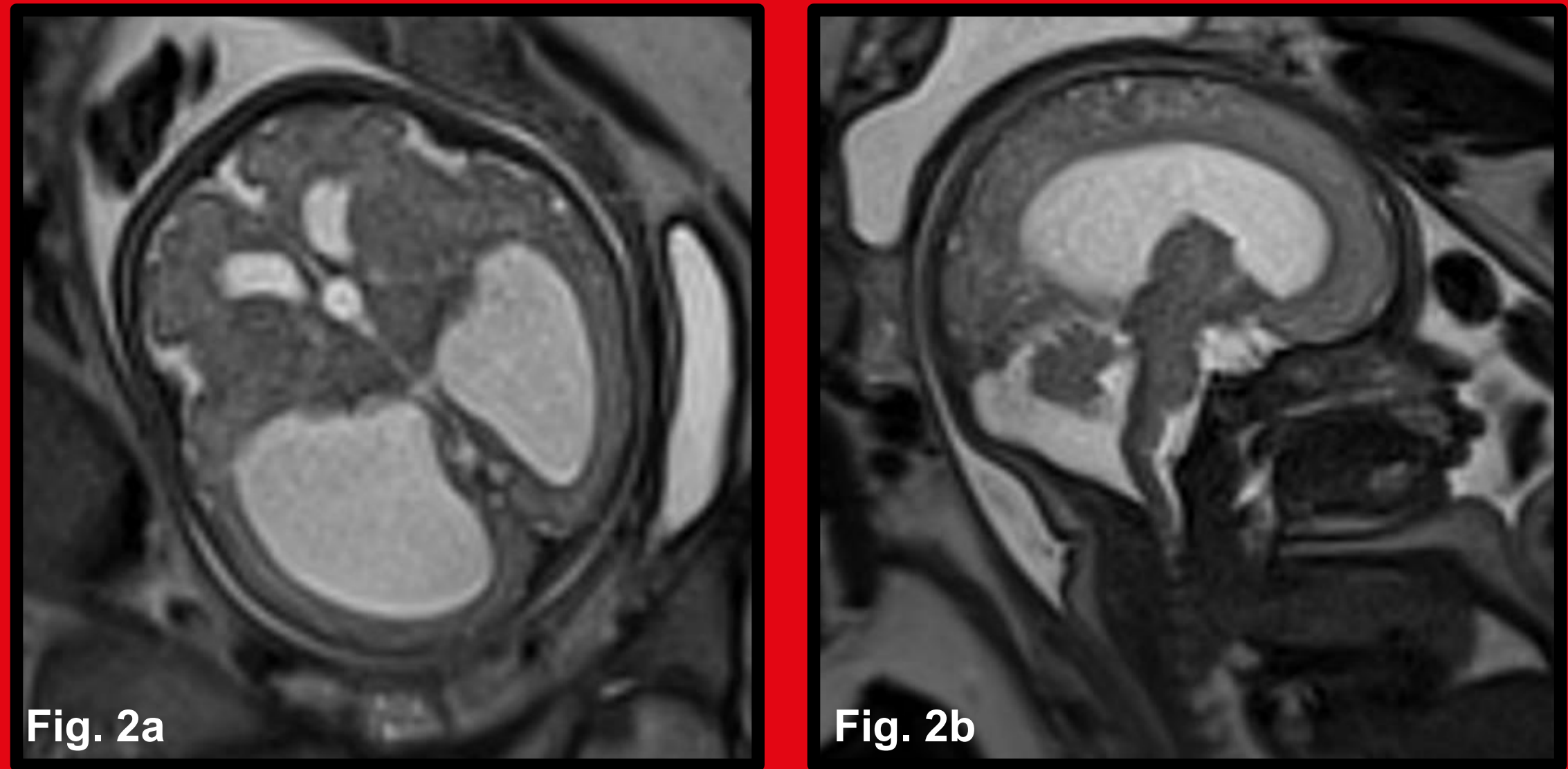


Fig. 2a (axial) and 2b (sagittal). Fetal MRI (37+1) showing bilateral severe ventriculomegaly and dilated third ventricle consistent with aqueduct stenosis

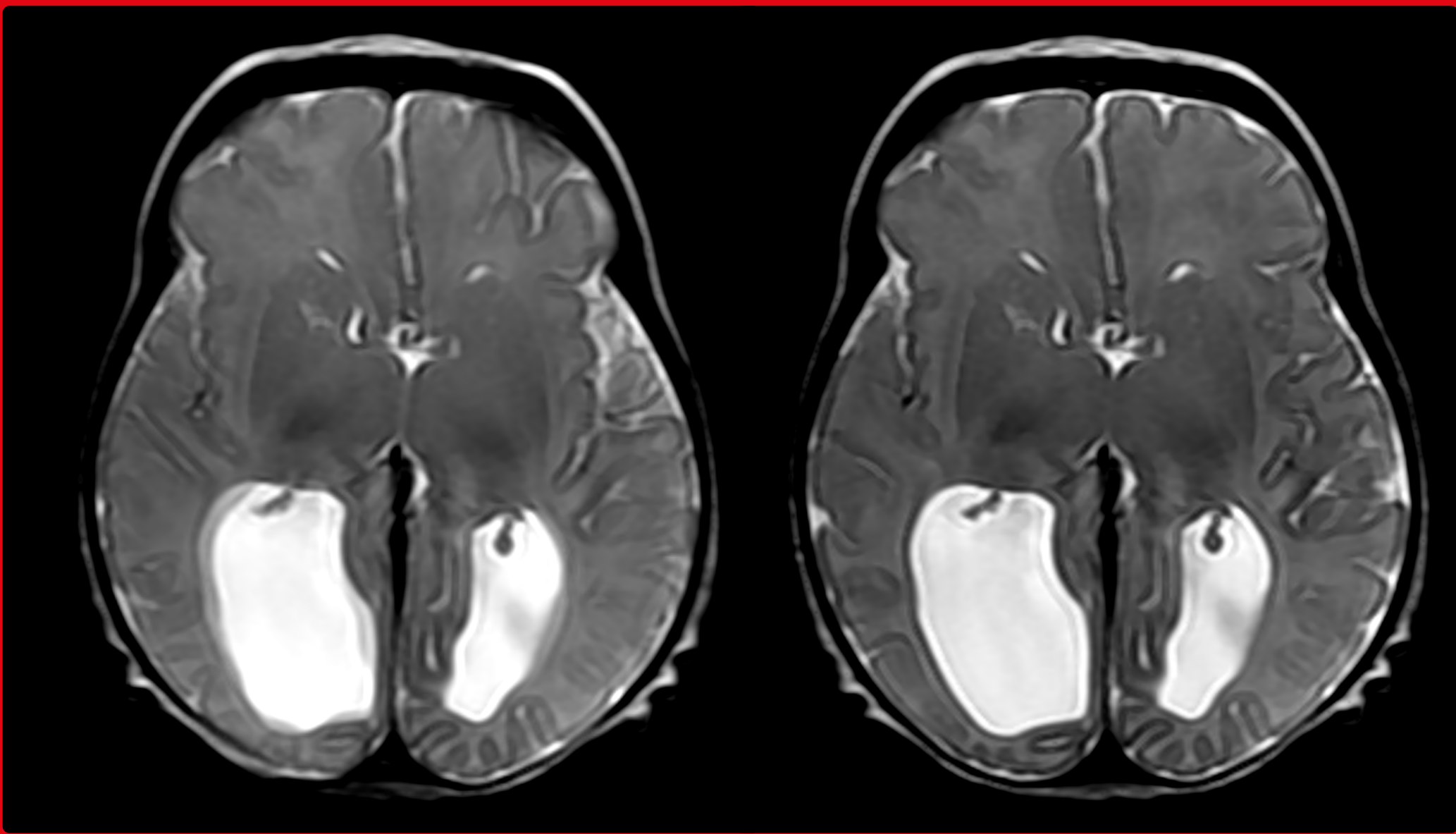


Fig. 3 Axial neonatal MRI (20d) showing barely visible myelination in Posterior Limb of the Internal Capsule (PLIC)