

Multimodal placental assessment in early fetal growth restriction: comparative evaluation with MRI and ultrasound

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Objective

To evaluates which placental imaging features can be identified using ultrasound and fetal MRI in early fetal growth restricion (FGR).

Methods

The placenta was evaluated in US and MRI imaging using parameters predefined by our study group (figure 1). Overall visual placental score (VPS) was calculated. Included cases were matched by gestational age (GA) with controls. Findings were compared between cases and controls. US findings were then compared to the MRI findings using cross tables.

Study metrics

- ✓ Retrospective analysis
- ✓ Single tertiary reference center
- ✓ Diagnosis of early FGR, ultrasound + fetal MRI

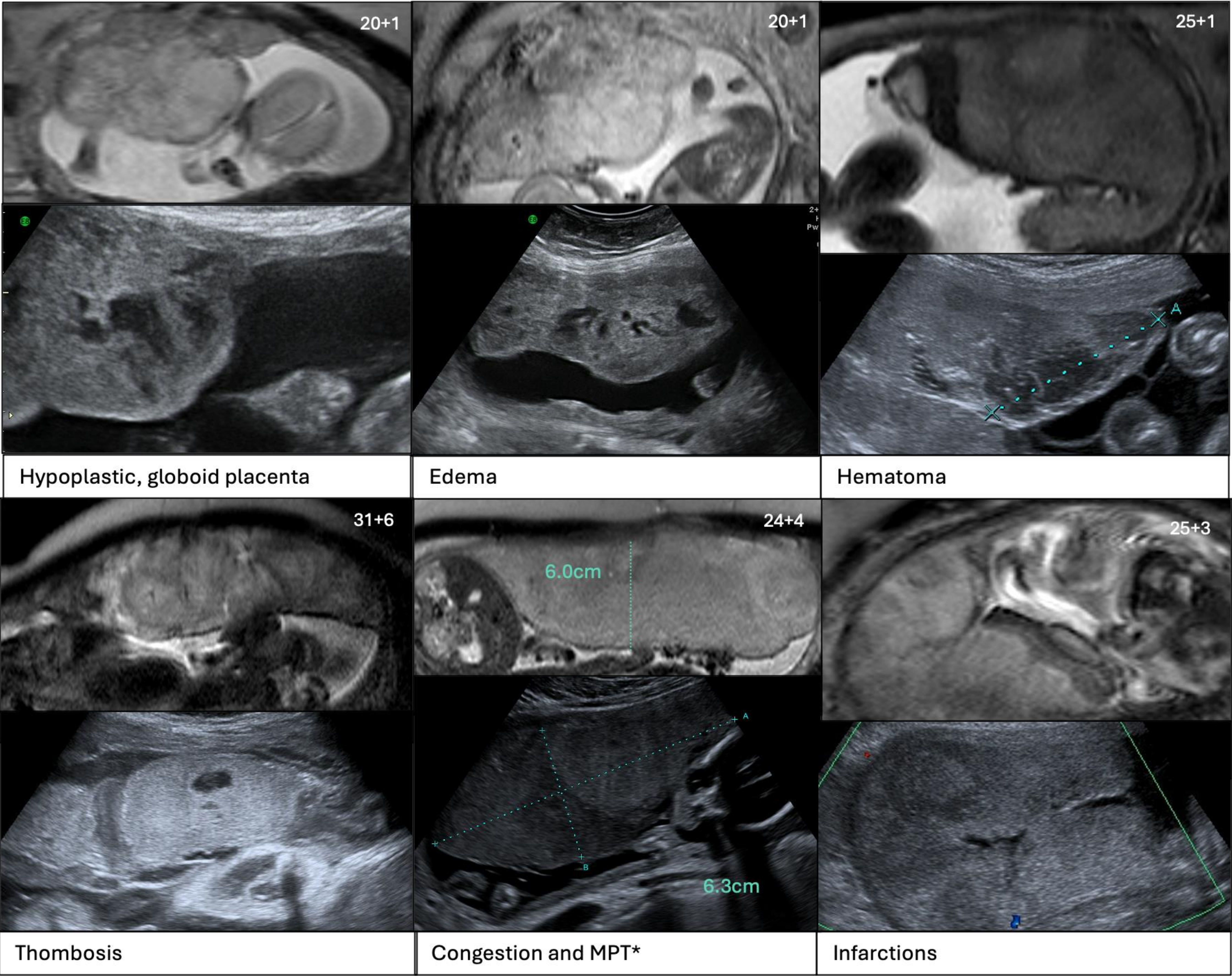


Figure 1 Images of placental sonomorphological and MRI features; upper image: MRI image T2 or T2*-weighted sequence; lower image: ultrasound image; *maximal placental thickness

Results

63 patients were compared with gestational age matched controls. When correlating the VPS of ultrasound and MRI we could find a significant correlation (correlation coefficient 0.97 p = 0.004). Most features (globoid shape, edema, congestion, thrombosis and infarctions) were mainly present in MRI, while not described in ultrasound, especially congestion and thrombosis, while hematomas were mainly described in US. Correspondanc e in US and MRI was shown for globoid shape (2/63), congestion (3/63), infarctions (19/63) and MPT (20/63). Correlations with outcomes did not show any significants.

Feature	Present in MRI	Present in US	Present in both
Hypoplastic appearance	7	16	4
Globoid shape	30	2	2
Edema	28	13	6
Hematomas	6	19	3
Congestion	42	4	3
Thrombosis	32	9	2
Infarctions	56	20	19
MPT	50	22	20

Conclusion

Our study shows low agreement in most features between MRI and ultrasound. Infarctions and elevated MPT were the most common features described in both modalities. We could show that edema, congestions, infarctions and thrombosis are more often visualized in MRI compared to ultrasound . This study suggests that the combination of both modalities could be beneficial in detecting early FGR.