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## Evaluation of the maximal placental thickness in early FGR by prenatal MRI

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### Objectives

This study evaluates the maximal placental thickness (MPT) as a diagnostic marker in early FGR, as there has not been made a consensus on imaging features of placental insufficiency.

### Methods

This retrospective study, conducted at the Medical University of Vienna, included all patients with diagnosed early FGR who underwent a prenatal MRI from 2008-2023.

MPT was compared to controls without placental insufficiency matched by gestational age (GA). A cut-off value for the MPT was evaluated. To obtain the optimal MPT cut-off depending on GA we created a formula.

A visual placenta score (VPS) was created scoring from 0-6. VPS includes following scoring system:

- Edema: 1 point
- Congestion: 1 point
- Thrombosis: 1 point
- Lobules: no lesions: 0 points, 1-2 lesions: 1 point, 3-4 lesions: 2 points, 5+ lesions: 3 points

### Conclusion

The results of this study demonstrate that the maximal placental thickness and the visual placental score are diagnostic tools in fetal MRI for early FGR. It provides a non GA-dependent cut-off value for MPT of 2.95cm and a formular for the optimal cut-off value of MPT in relation to gestational age. The Visual placental Score is even more predictive on FGR and is positive when more than 2 points are given.

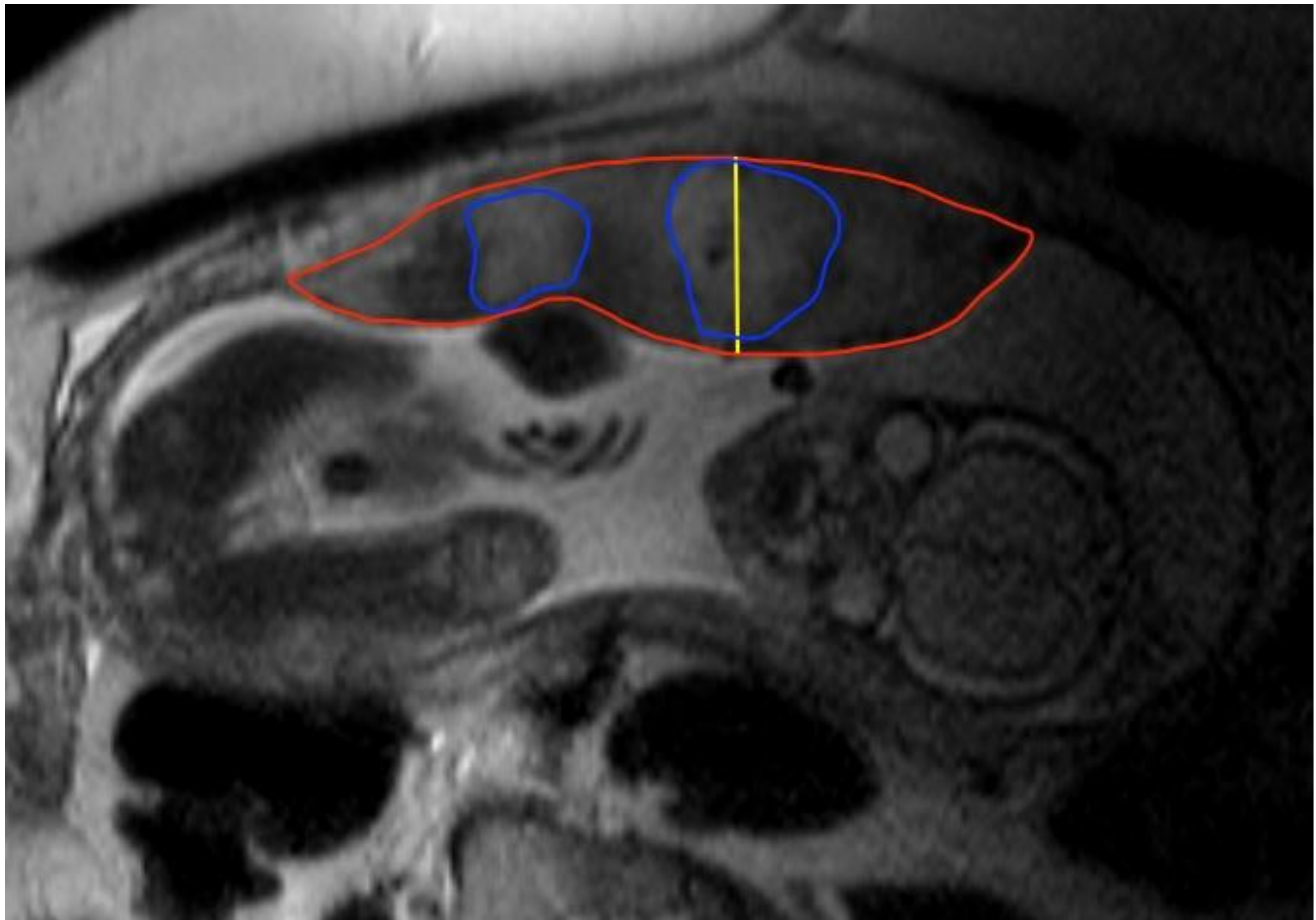


Figure 1. fetal MRI of early FGR in GW 27+5 (1.5 T, T2-weighted), in red the placenta, in yellow the measurement of MPT (4.1cm), in blue lobules (infarctions)

### Results

80 Patients with early FGR were eligible for this analysis with a mean GA of 26+6 (SD3.9) at time of MRI. Mean MPT showed a significant difference to the mean MPT of the controls ( $p < 0.001$ ). MPT of FGR and controls correlate with GA significantly.

The cut-off for normal MPT was calculated with 2.95cm (sensitivity 83.8%, specificity 70%).

The cut-off for VSP is 2 (sensitivity 88.8%, specificity 92.5%).

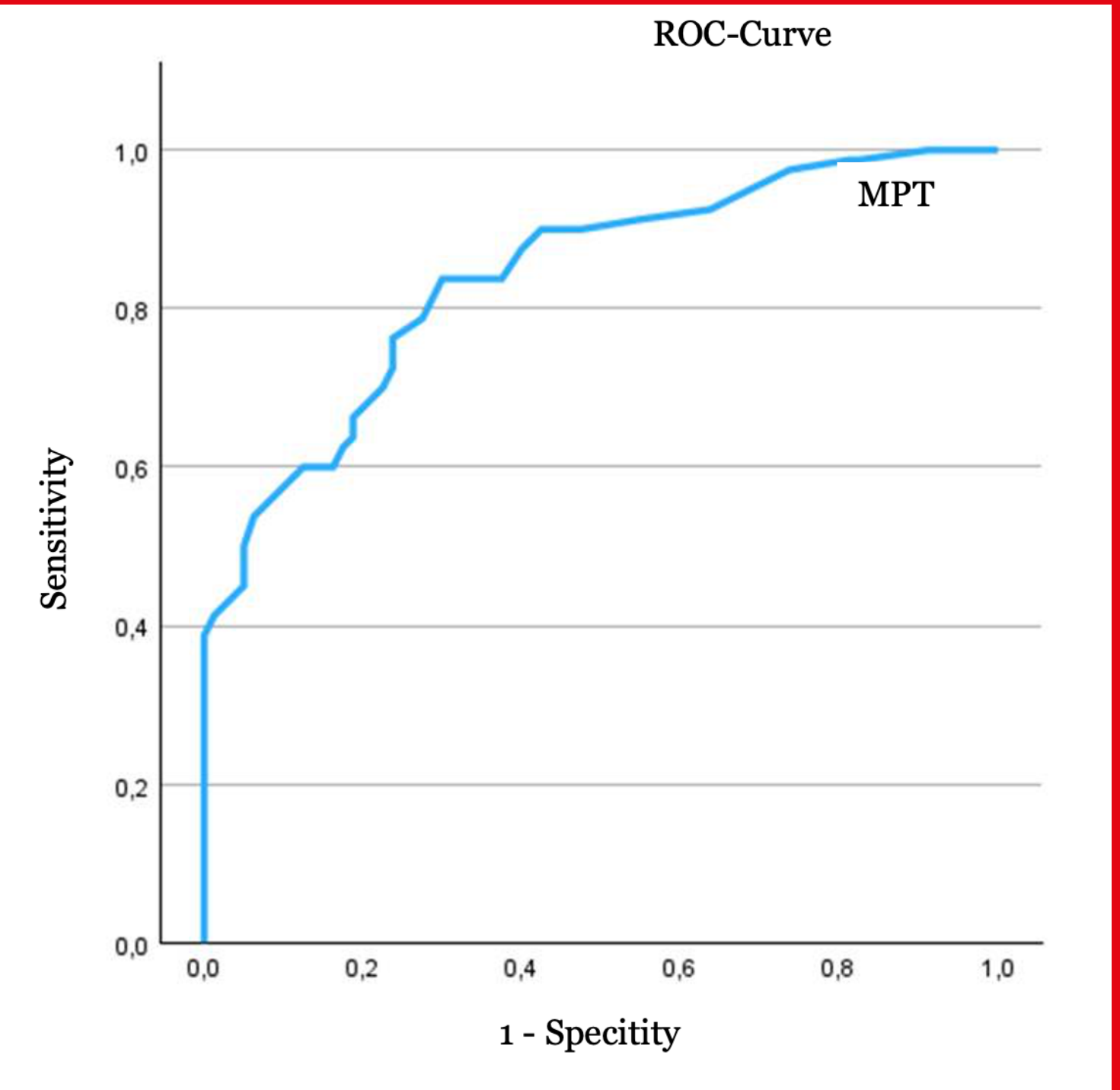


Figure 2. ROC of MPT

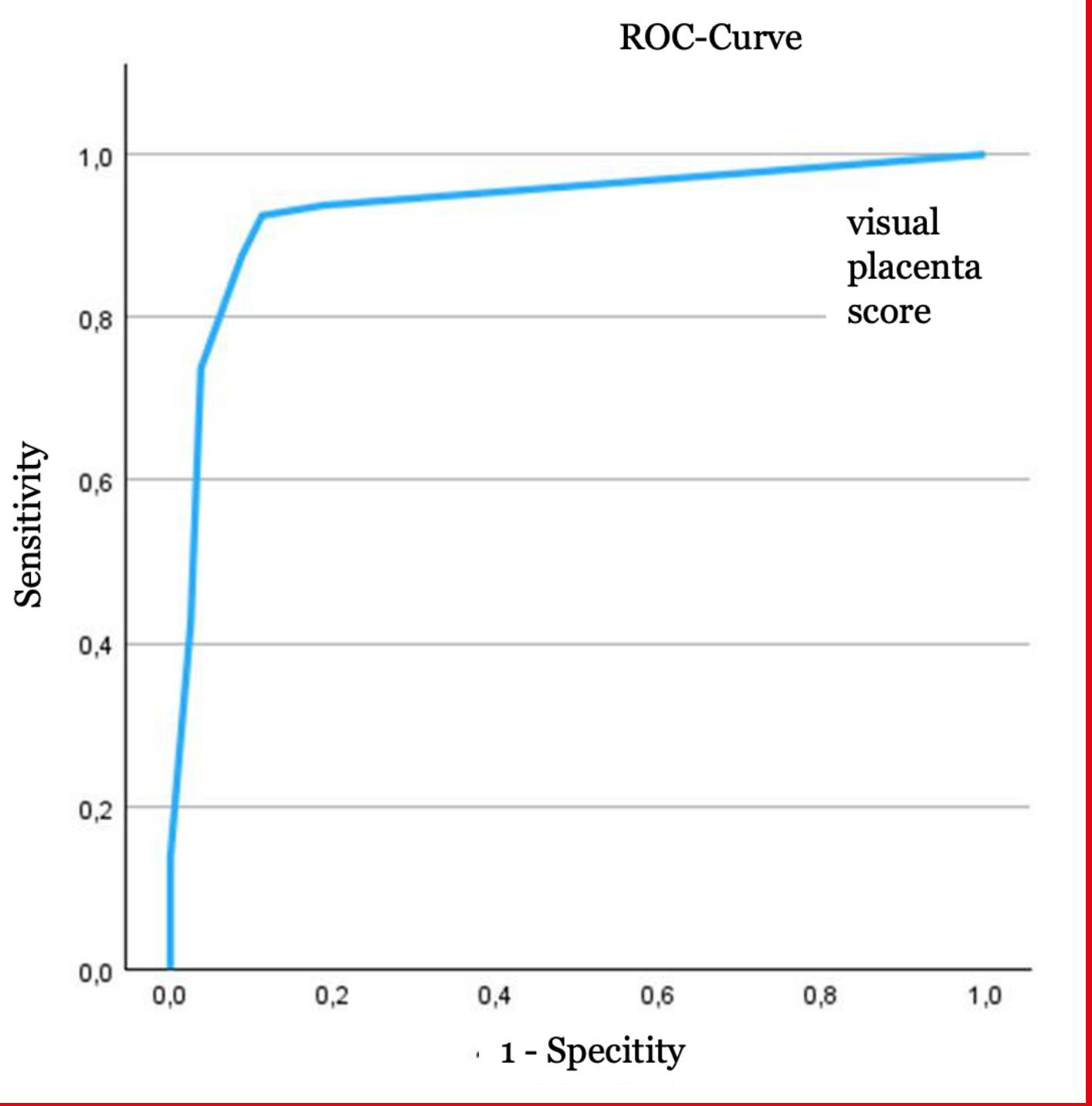


Figure 3. ROC of VPS

Optimal cut-off =  $(0.164 \cdot \text{GA} - 0.0676) / 1.408$ .

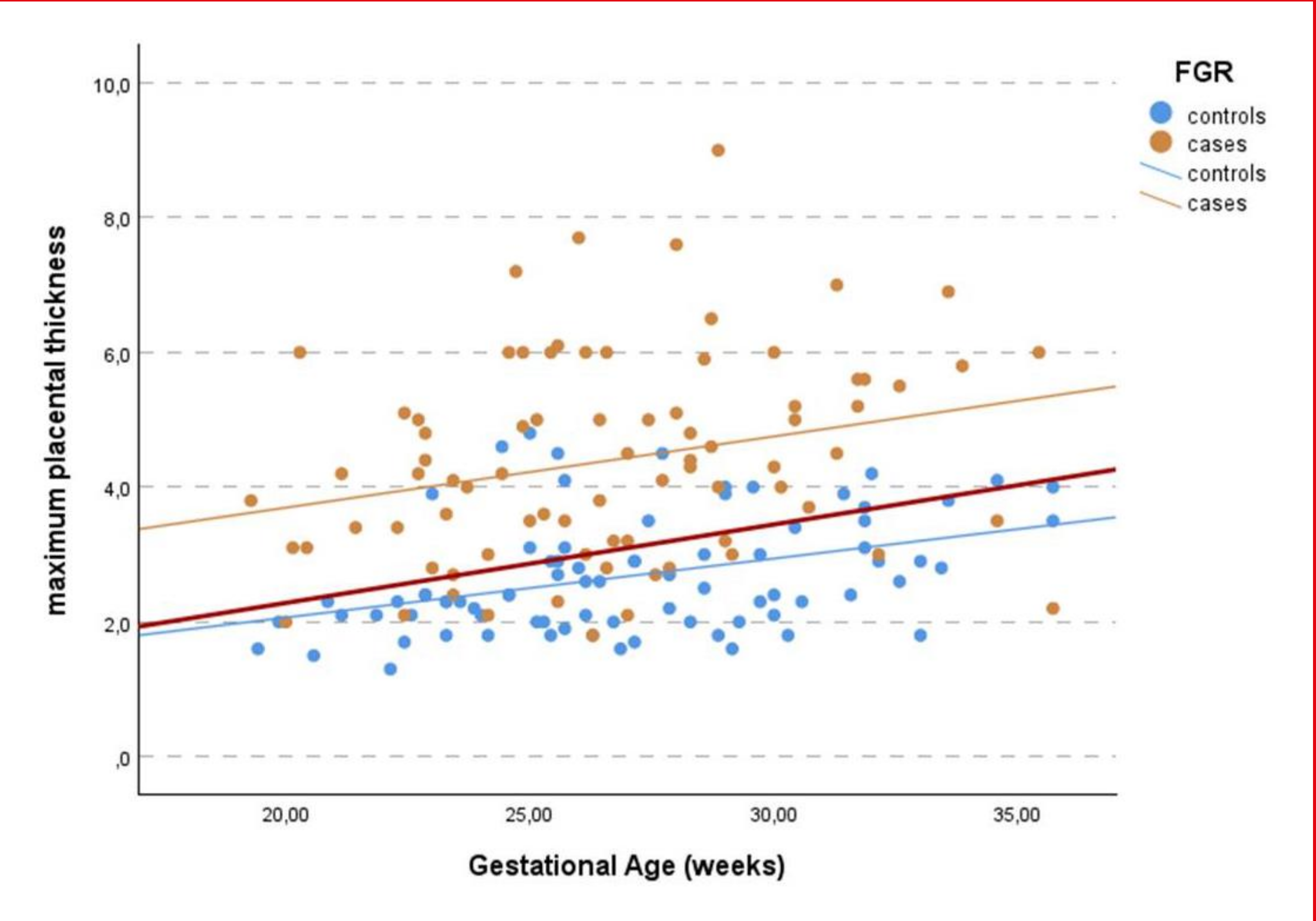


Figure 4. MPT Comparison of FGR and Controls depending on GA