Magnetic resonance imaging of placental invasion

Elspeth Whitby
University of Sheffield
Placental invasion

• Risk to both mother and baby if not diagnosed before delivery
• Increasing in incidence in the UK
• Some of this accounted for by the increasing caesarean section rate
• Difficult to diagnose confidently
Placental invasion - Sheffield

- 6 patients imaged using MRI from 1998-2009
- 4 patients in 4 months at the end of 2010
- Service evaluation at the request of O&G staff.
- Jan 2011 RCOG green top guidelines suggested if there was any uncertainty then Ultrasound and MR were both advised.
- Limited experience worldwide.
Ultrasound signs of invasion

- Placenta previa
- Prominent lacunae
- Abnormal colour Doppler imaging patterns – due to turbulent flow in lacunae
- Loss of retroplacental clear space – seen as loss of the hypoechoic line
- Anomalies of the bladder- myometrium interface
- Uterine bulging
MR signs of invasion

- Heterogeneity
- Dark intraplacental bands
- Uterine bulging
In the beginning.....
Sheffield experience

- T2 5mm and 3mm (SSFSE)
- T1 breath hold if possible
- DWI
- Initial scans difficult to see the placenta-myometrium interface
- Took sequences from the cardiac package and altered them
- Balanced gradient echo
Sheffield findings

- Balanced gradient echo good for interface but made the placenta featureless and the dark lines became light! Best for uterine bulging
- T2 best for dark lines
- T1 limited value – bleeds
- DWI useful in cases with invasion and bulging
problems

• Site of C Section scar
• Percreta - relatively easy to diagnose
• Increata – harder to diagnose
• Accreta _ ? Impossible or very difficult at present.
percreta
percreta
percreta
accreta
accreta
normal
Normal
Normal
Other risk factors
Other risk factors
Initial papers

- Teo TH,.Clin Radiol. 2009 May;64(5):511-6
- Lax A,. Magn Reson Imaging. 2007
Latest papers.

- Derman AY. AJR Am J Roentgenol. 2011 Dec;197(6):1514-21 – vascularity and dark bands
conclusion

• Still developing
• Dark bands, heterogeneity, uterine bulging still best signs at present.
• Look at normal placentas when doing fetal MRI
• Follow up essential
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