

Surgeon Survey Shows No Adverse Events with MRI in Patients with Magnetically Controlled Growing Rods (MCGR)

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Disclosures

No Support for this study

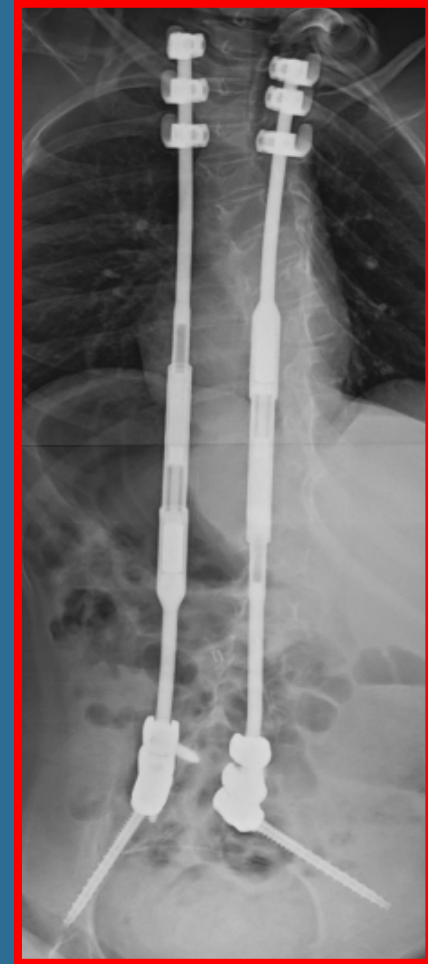
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Background

- Incidence of intraspinal anomalies in patients with congenital scoliosis ranges from 15-40%
- MRIs are often clinically indicated in the EOS population
- No detrimental effects of MRI on the MCGR (in vitro and cadaveric studies)



Background

There are currently no outcomes studies on MCGR patients after MRI use



Purpose

To determine if MRI following implantation of MCGR is associated with any adverse events to the patients or device



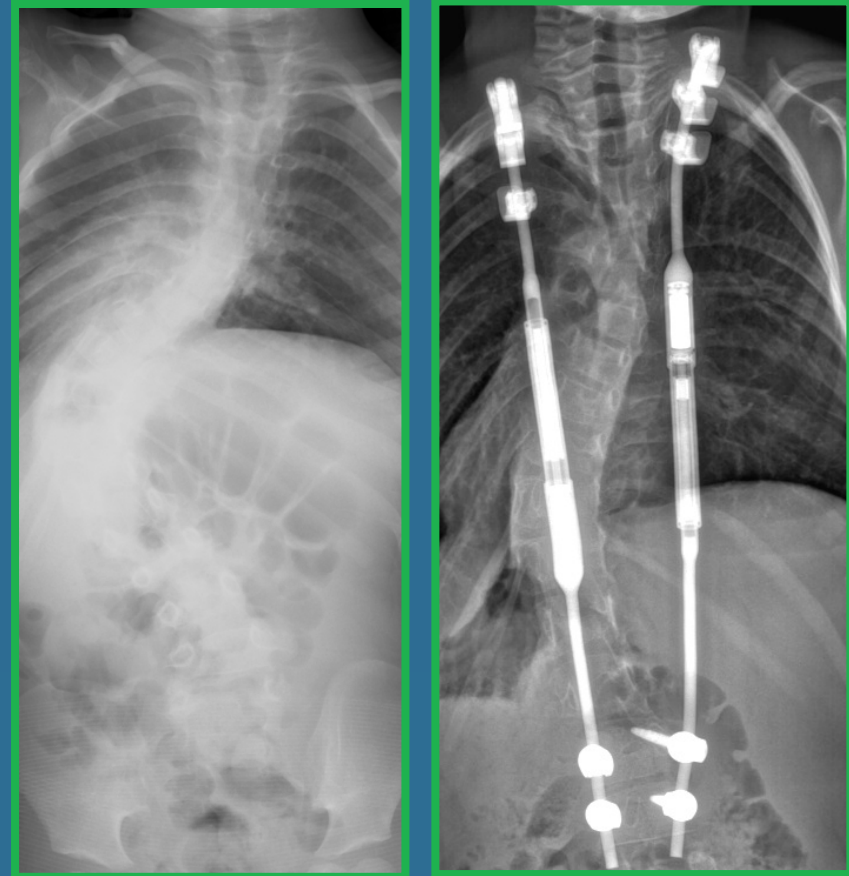
Methods

- A survey was administered via RedCap© to pediatric spine surgeons who are members of:
 - Growing Spine Study Group
 - Children's Spine Study Group
 - Early international users



Results: No Harm to Patients

- 118 surgeons were surveyed
- Four reported 10 patients had an MRI with an implanted MCGR



Results: No Harm to Device

- No problems were observed with function following MRI
- Mean 2.1 mm (range, 0.5-3mm) obtained at next lengthening



Results: No Harm to Device

Adverse Events	Rate of Occurrence	Number of events
Loss of fixation	0%	0/10
Movement of implants	0%	0/10
Unintended lengthening or shortening	0%	0/10
Noticeable heating of MCGR*	0%	0/10

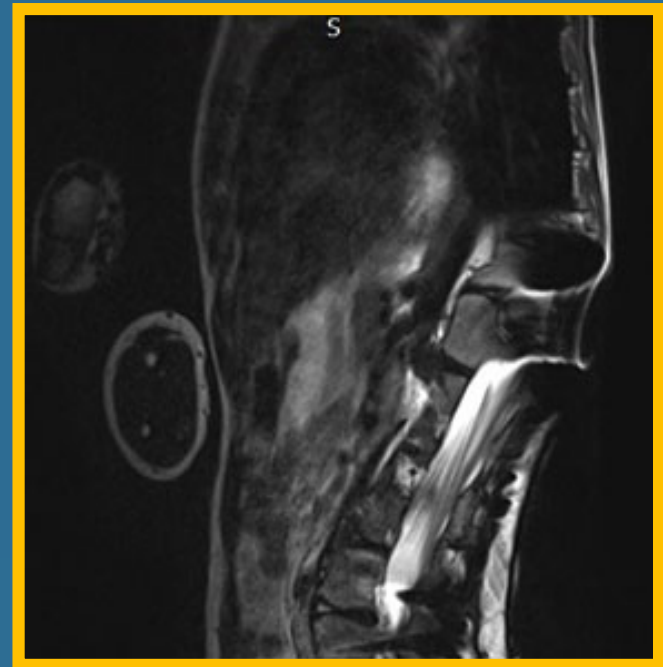
*Poon et al., AAP 2016

Results: Limited Imaging

Type of MRI	Interpretation possible?
Brain	100% (2/2)
Cervical spine	100% (7/7)
Thoracolumbar spine	0% (0/6)

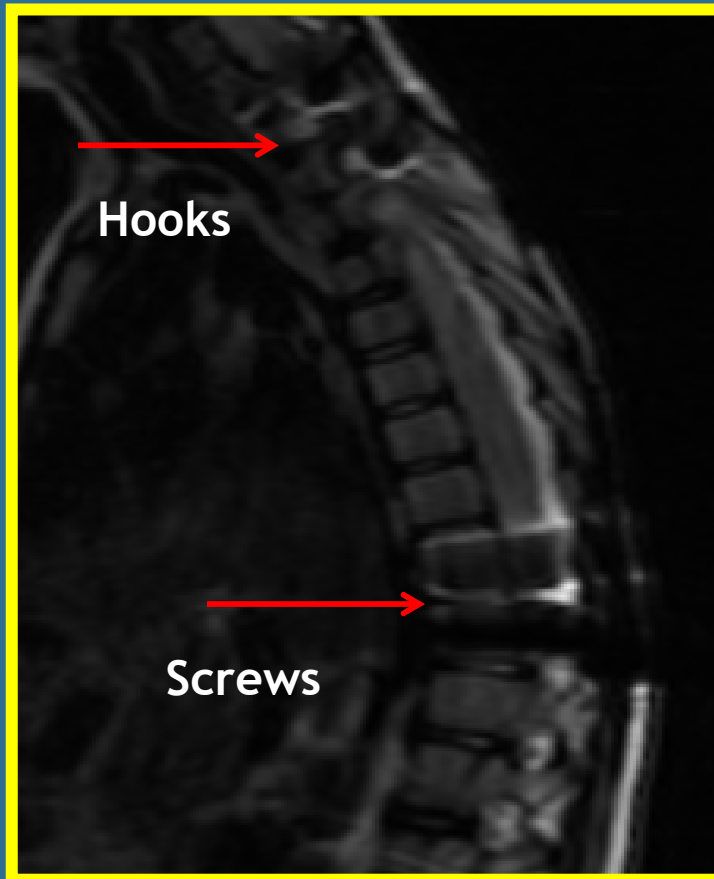
Conclusion

- 10 cases of MRI use in vivo with MCGR
- No adverse events to patient or device
 - Still lengthened
- MRI was interpretable in the brain and cervical spine but not thoracolumbar spine

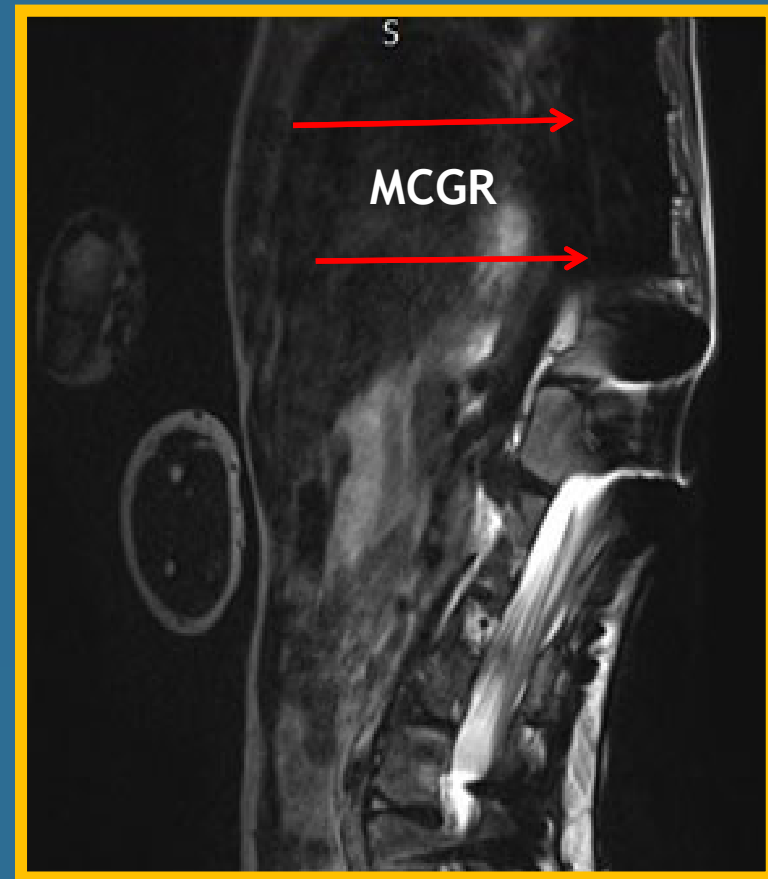


Conclusion

TGR

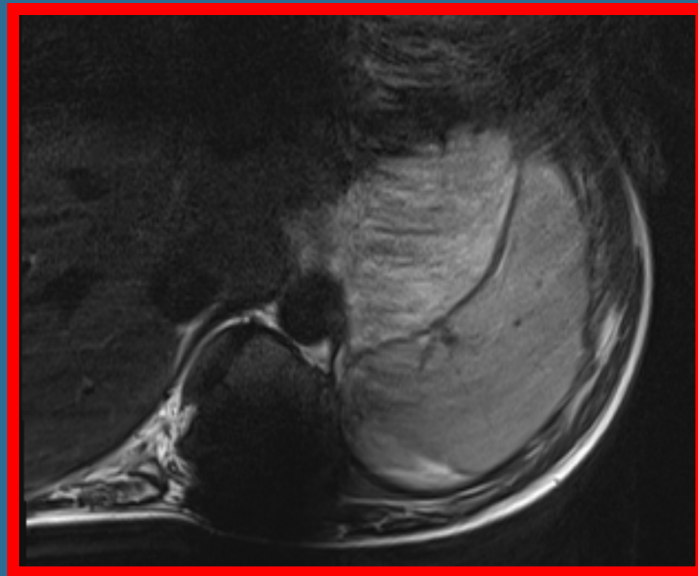


MCGR



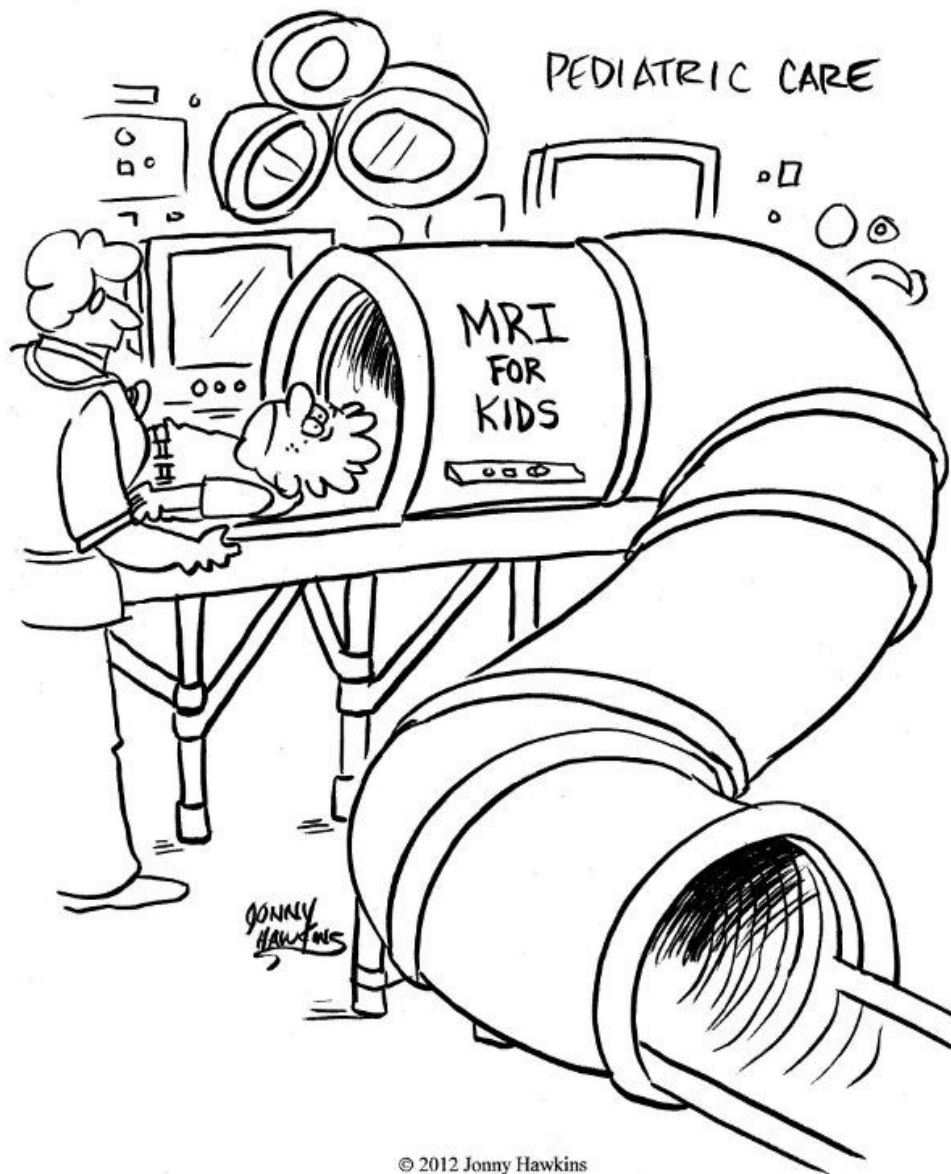
Take Home Message

- MRI of MCGR is unlikely to cause harm to the patient or device in a 1.5T scanner
- This limited study supports the recent FDA clearance



References

- Budd HR, Stokes OM, Meakin J, Fulford J, Hutton M. Safety and compatibility of magnetic-controlled growing rods and magnetic resonance imaging. Eur Spine J. 2015 Aug 14.
- Poon, S, Graver, A, Wendolowski, S, Gecelter, R, Chen, YH, Nixon, R, DiMauro, JP, Amaral, T. A Pilot Cadaveric Study of the Safety and Efficacy of Magnetic-controlled Growing Rods After Exposure to Magnetic Resonance Imaging. Presented at AAP 2016 Annual Meeting.



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Thank you!