

The role of Halo Gravity
Traction prior to MCGR,
when does correction
occur?

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Disclosures:

Michelle Welborn: Depuy Synthes- Consultant; K2M advisory panel; POSNA research grant recipient; editor JPO, Spine deformity

Dan Bouton: nothing to disclose

Ivan Krajbich: K2M- Consultant

Back ground

Over 6,000 MCGR cases have been performed world wide

Thacker et al reviewed 15 MCGR papers

- Preop Cobb 64.8
- Postop Cobb 36.4
- Average percent correction of 44%



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What are the outcomes in severe EOS treated with HGT prior to MCGR?

Treatment of severe scoliosis with HGT prior to MCGR has not been previously reported

Would they achieve appropriate initial correction?

- What was the impact of HGT?
- Was it even necessary?

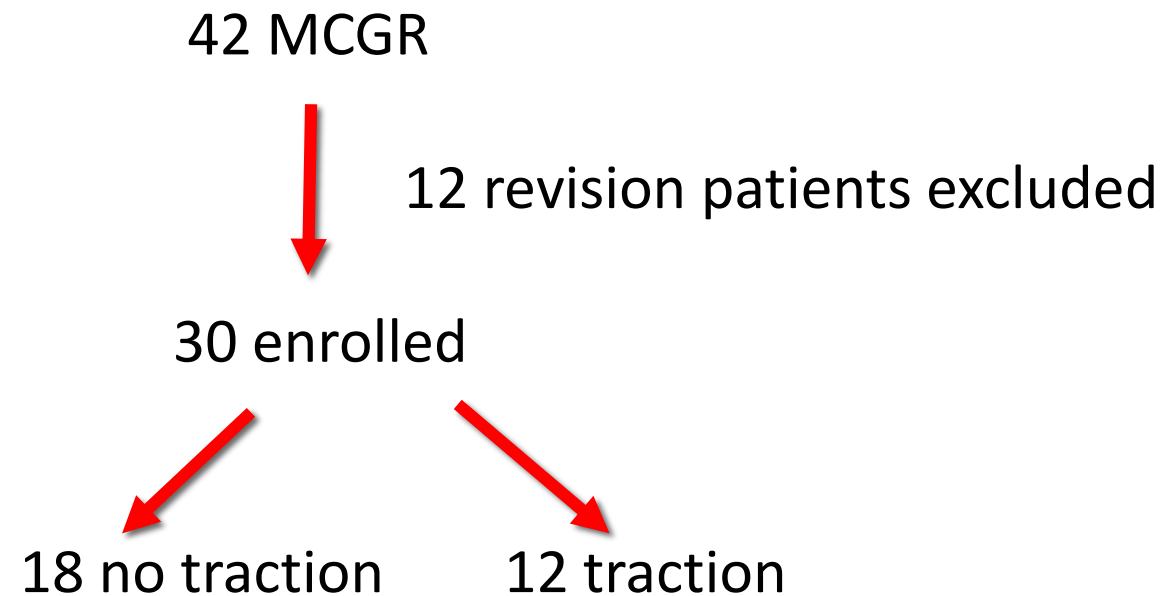
Would they maintain that correction?



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Methods

- IRB approved retrospective cohort study of a prospectively collected database
- 42 MCGR patients from 2014-2017 treated at a single institution
 - All patients failed conservative management
 - all genders, ethnicities, and underlying diagnosis were included.



Traction protocol

- 6+ pins
- weight increased BID
- traction for 4-8 weeks total based on:
 - severity of curvature, preop nutrition status, and response to traction.
 - Average of 48 days range (30-76)
- Max activity encouraged:
 - School, traction walkers, wheelchairs, bikes, accessible playground



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Would they achieve appropriate
initial correction?

Results

	Preop Cobb	Flexibility film Cobb	Absolute correction flexibility film	Percent correction flexibility film	Postop Cobb	Ave Correction	Percent Correction
Traction n=12	90° (69-114°)	78° (60-100°)	13° (3-59°)	14% (3-29)	46° (31-57°)	45° (37-59°)	49% (34-68)
Non traction n=18	77° (56-113°)	46° (19-66°)	32° (5-70°)	40% (7-66)	34° (18-50°)	44° (19-74°)	54% (26-74)
P-value	0.027	0.000	0.002	0.000	0.421	.743	.244



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At what point is the correction occurring? What was the impact of HGT?



Preop Flexibility



Intraop

Traction





At what point is the correction occurring?

	Preop Cobb	Preop Flexibility	Post traction Cobb	Postop Cobb
Traction n=12	90°  27%	78°	59°	46°
Non traction n=18	77°  72%	46°	NA	34°












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Equivalent correction post HGT to Flexibility Film in nonHGT group

	Preop Cobb	Preop Flexibility	Last in traction Cobb	Postop Cobb
Traction n=12	90°	78°	59°	46°
	 			
				
Non traction n=18	77°	46°	NA	34°
				

same correction achieved between Post traction Cobb and Postop Cobb as the Flexibility Cobb and Postop Cobb in the non traction group

	Preop Cobb	Preop Flexibility	Post traction Cobb	Postop Cobb
Traction n=12	90°  27%	78°  43%	59° 	46°
	 70%		 30%	
Non traction n=18	77° 	46°	NA 	34°
	 72%		 28%	
P-value	0.027	0.000	NA	0.421

Would they maintain that
correction?



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Lengthening protocol

Maximum correction sought in OR

First lengthening 8 weeks postop

Frequency:

- q6-8 weeks

Lengthen: 2-3mm

Radiographs:

- EOS microdose PA/Lateral full spine q3 lengthenings

Clinical exam:

- Palpate anchors at each visit to evaluate for increasing pain, prominence or bursa

Preop
PA

Lateral



Final in traction
PA

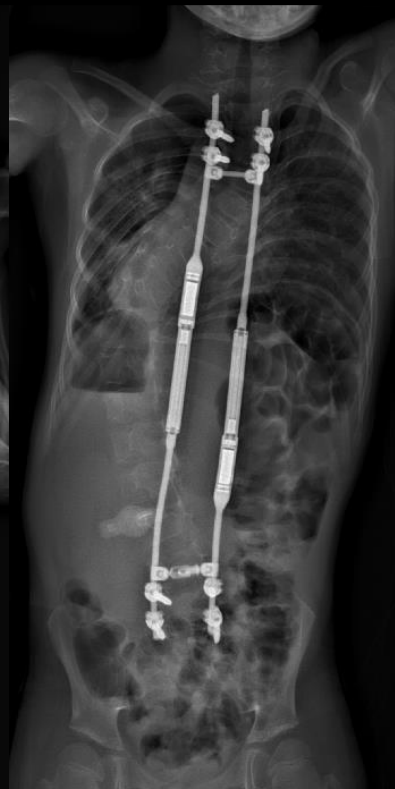


Postop
PA

3 years later
PA



Lateral



Results – most recent follow-up

	Preop Cobb	Postop Cobb	Most recent Cobb	Change in Cobb postop vs most recent	Average Follow-up (days)
Traction n=12	90° (69-114°)	46° (31-57°)	44° (28-65°)	-2° (-13-9)	878
Non traction n=18	77° (56-113°)	34° (18-50°)	40° (17-63°)	6° (-5-17)	804
P-value	0.027	0.421	.838	0.019	



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Conclusion:

Equivalent correction to flexible curves can be achieved in more rigid curves through the use of traction

43% of the total correction achieved occurred in traction

Equivalent correction occurred intraoperatively in both groups

Postoperatively we did not see diminishing returns

- neither group lost correction over time $p=0.019$
- HGT gained correction at final follow-up indicating HGT continues to effect the patient positively long past the initial implantation



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Thank you

