

Comparative outcomes of monthly versus three-monthly distraction protocols for magnetically controlled growing rods

Cora Bow¹, Markus Lastikka², Karen Yiu¹, Kenny Kwan¹,
Ilkka Helenius², Kenneth MC Cheung¹, Jason Pui Yin Cheung¹

¹ The University of Hong Kong

² University of Turku, Finland



Disclosures

- Ilkka Helenius: Medtronic, Baxter
- Kenneth Cheung: Nuvasive, AOSpine
- All other authors have nothing to disclose.



Background

- Magnetically-Controlled Growing Rod (MCGR) is the current popular treatment for EOS
- **No agreement for the ideal frequency of distraction**



Aim

– The effects of distraction frequencies on

- Distraction length
- Curve control



Design

- Prospective comparative study between two distraction protocols from two centres:
 - The University of Hong Kong
Group 1 (monthly, 2mm)
 - University of Turku, Finland
Group 2 (3-monthly, 5mm)



Method

- Retrospective review of prospectively collected data at **six monthly intervals**
 - Clinical
 - Radiographic
- Early Onset Scoliosis cases only
- Minimum of 4 years follow-up
- Age-, sex-, and height-matched, all dual-rods
- Only data prior to rod exchange were used



Demographics

	Group 1 (n=4) Monthly 2mm	Group 2 (n=4) 3 monthly 5mm	P-value
Mean age at surgery	5 ± 0.9 years	4.6 ± 1.0 years	N.S.
Male : Female	2 : 2	2 : 2	
Mean height at baseline	112.9 ± 1.9 cm	111.5 ± 7.8 cm	N.S
Diagnosis	Ehlers-Danlos Infantile idiopathic Neuromuscular Syndromal	Infantile idiopathic Infantile idiopathic Neuromuscular Juvenile idiopathic	



Comparison on distraction length at 30 months follow up

	Group 1 (n=4) Monthly 2mm (Target: 12mm/6mo)	Group 2 (n=4) 3 monthly 5mm (Target: 10mm/6mo)	P-value
Achieved target increment length every 6 months	7.5% (3/40)	32.5% (13/40)	0.01
Average rod gain per 6 months	7 ± 3.1mm	7 ± 3.2mm	N.S.
Total Rod length gain at Month 30	40 ± 6mm	38 ± 5mm	N.S.
Body height gain at Month 30	12.8 ± 2.6cm	14.8 ± 4.2cm	N.S.



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	Group 1 (n=4) Monthly 2mm (Target: 10mm/6mo)	Group 2 (n=4) 3 monthly 5mm (Target: 10mm/6mo)	P-value
Achieved target increment length every 6 months	20% (8/40)	32.5% (13/40)	N.S.
Average rod gain per 6 months	7 ± 3.1mm	7 ± 3.2mm	N.S.
Total Rod length gain at Month 30	40 ± 6mm	38 ± 5mm	N.S.
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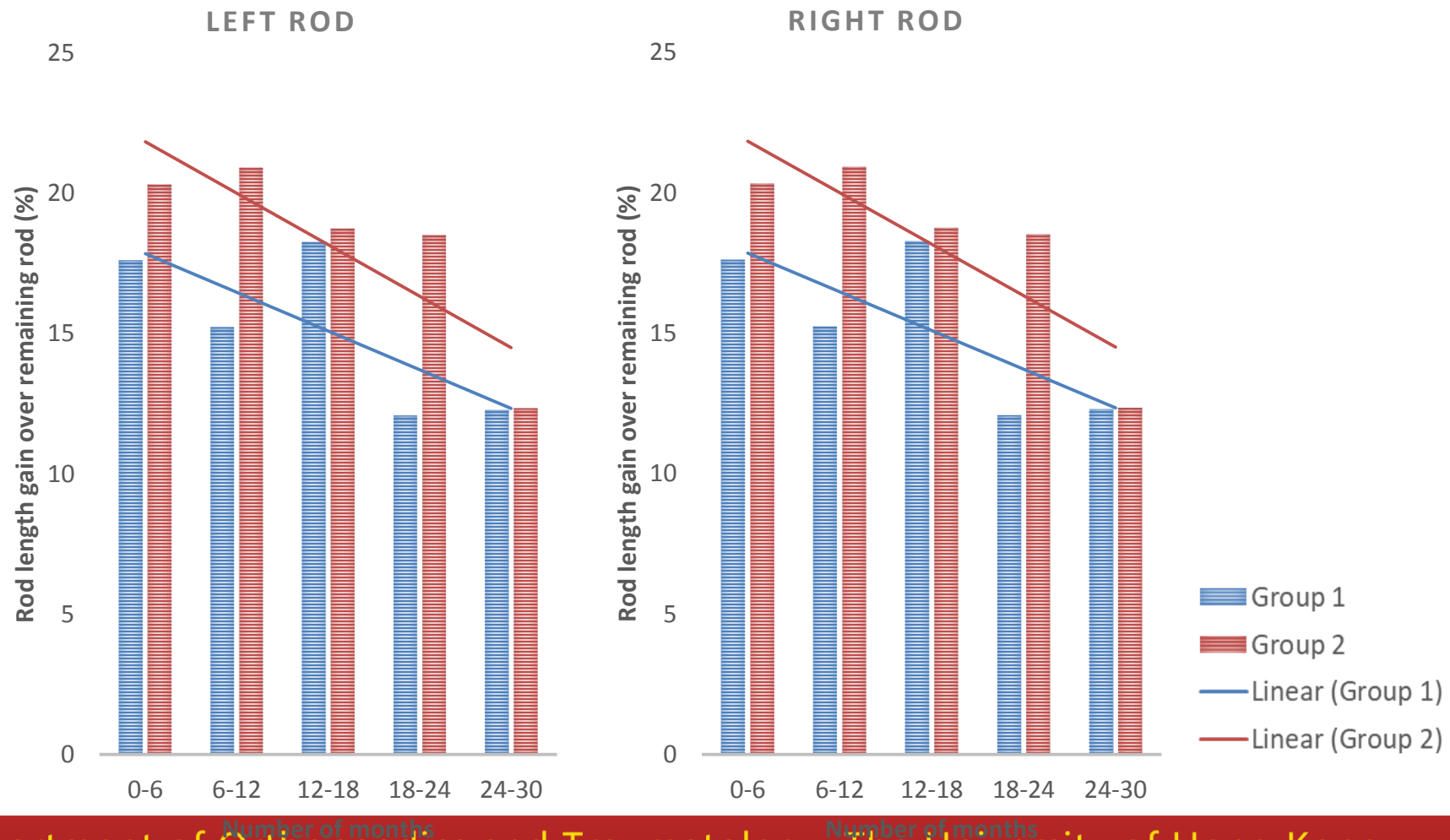


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The law of reducing length gains present in both groups and in all rods



No difference in curve control at 48 months follow up

	Group 1 (n=4) Monthly 2mm	Group 2 (n=4) 3 monthly 5mm	P-value
Coronal Cobb angle	30.5 ± 10.5°	28.9 ± 4.6°	N.S
Sagittal Cobb angle	28.0 ± 15.2°	32.0 ± 12.7°	N.S
Proximal junctional angle	11.0±11.5°	15.9±14.2°	N.S
PJK	2 patients	2 patients	N.S.



Discussion

- This is the first preliminary small scale study comparing two distraction protocols for MCGR.
- Group 1 (2mm monthly distraction) has a higher chance of not achieving targeted length gain.
- Law of reducing length gains occurs



Aim

- The effects of distraction frequencies on
 - Distraction length
 - Curve control
- **There is no difference between 3 monthly at 5mm and 1 monthly at 2mm distraction**



Thank you for your attention

Faculty of Medicine, HKU



Turku University Hospital, Finland



Queen Mary Hospital



Department of Orthopaedics and Traumatology, The University of Hong Kong

香港大學矯形及創傷外科學系

