How much do remote magnetic expandable devices truly expand. A radiographic evaluation of the Magec System

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Disclosures

• Lindare Medical
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Introduction

• Magnetic Controlled Growth Rods (MCGR) allow controlled distraction using the external remote controller (ERC)

• Theoretically the amount of distraction can be matched to patients own growth – ‘Tail-gating’

• Disparity between ERC and true distraction has not been evaluated
Objectives

• Primary
  – Evaluate the disparity between the intended (ID) and true distraction (TD)

• Secondary
  – Assess growth and development in our cohort after sequential lengthenings
Methods

• All patients undergoing insertion MCGR – Magec™ (Elipse Technologies) with a minimum of 3 distractions.
• Three monthly distractions
• Amount of distraction determined by Dimeglio’s annual T1-L5 growth velocity
• Rod actuator imaged with fluoroscopy
• Expansion gap within rod measured and calculated using width of the rod to allow for magnification
• Weight, standing height, sitting height measured at each distraction.
Calculating True Distraction

Figure 1a (left): Fluoroscopic view of the actuator prior to distraction.

Figure 1b (right): Actuator post distraction. The true distraction gap can be measured and calculated by using the width of the rod (9mm) to allow for magnification.

True gap = width of rod measured on fluoroscopy / 9

Distraction gap measured on fluoroscopy.
Results

• 16 patients, 8 primary and 8 conversion cases

• Mean age = 5.6 years

• Mean follow up = 20 months (10-24 months)

• Average number of distraction = 6 (3-8)

• 15 dual rod and 1 single rod constructs
Results
Distraction Achieved

- Mean Intended 22.5mm (11.9-32.3) : Mean True 11.8mm (4.2-22.3)
- 53.7% of intended distraction achieved in all patients
- 65% achieved in primary patients
- 43.7% achieved in conversion patients
Percentage of Distraction Achieved
Growth and Development
Standing Height
Discussion and Conclusions

• Spines stiffer following surgery?
  – 1.45 x more distraction achieved in primary patients
  – ‘Law of diminishing returns’

• 15/16 patient under distracted
  – 14/16 under 50th centile

• All patients continued to grow and gain height
Thank You