Effects of Frequency of Distraction in Magnetically-controlled Growing Rod Lengthening on Outcomes and Complications

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Background

- Traditional Growing Rod
- Magnetically-Controlled Growing Rod (MCGR)
  - Non-invasive outpatient distraction
  - No anaesthesia required
  - Mimic physiological growth
- Ideal frequency of distraction is not known

Aims

To determine the effects of distraction frequencies

- on implant-related complications
- re-operations

Design

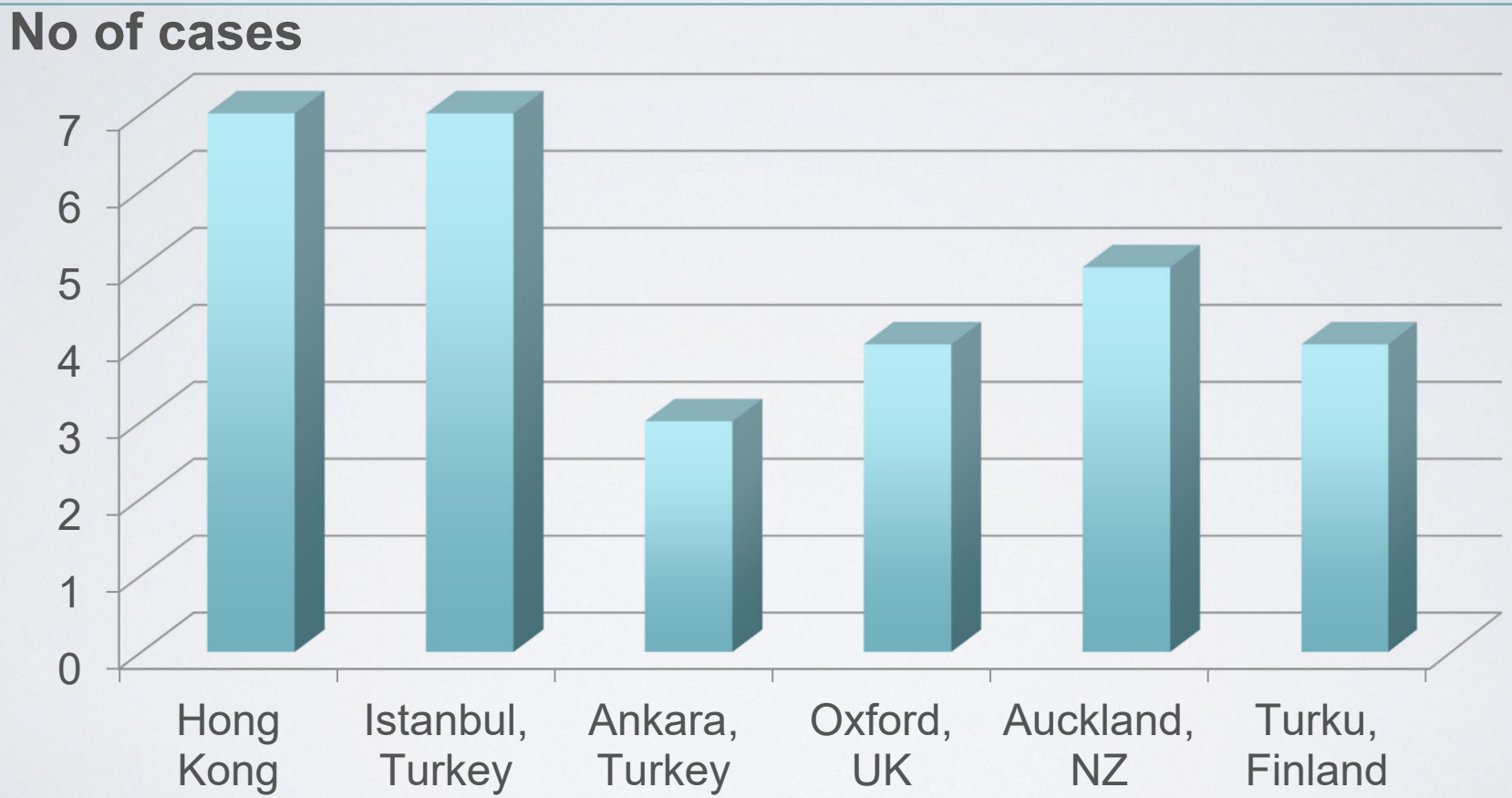
Multi-centered study involving 6 spinal institutions

- **Hong Kong** -The University of Hong Kong
- **Turkey** -Acibadem University School of Medicine
- **New Zealand** -Starship Children Hospital
- **UK** -Oxford University Hospitals
- **Finland** -Turku University Hospital
- **Turkey** -Hacettepe University

Method

- Retrospective review of prospectively collected data
- 6 centers
- Prospective data collection
  - Clinical data
  - Radiographic data
- Minimum of 2-year follow-up
- Only Early Onset Scoliosis cases were included

30 patients (19F; 11M)



Results

- 30 patients
- Diagnosis
  - 6 → Congenital (19%)
  - 8 → Idiopathic (27%)
  - 8 → Syndromic (27%)
  - 8 → Neuromuscular (27%)
- Mean age at the time of surgery was 7.3 years (4-14)
- Mean follow-up period was 35 months (24-61)

Distraction Frequencies

2 groups according to distraction frequency:

- Group 1 (every 1 week-2 months) : 14 patients
- Group 2 (every 3 - 6 months) : 16 patients

	Group 1 (n=14) Distraction every 1 week to 2 months	Group 2 (n=16) Distraction every 3 to 6 months
Re-operation	10 patients (71%)	4 patients (25%)
PJK	3 patients (21%)	2 patients (12.5%)

	Group 1 (n=14) Distraction every 1 week to 2 months	Group 2 (n=16) Distraction every 3 to 6 months
Causes of re-operation	- Failure of rod distractions: 8 cases - Foundation failure: 3 cases - Infection: 1 case - Coronal imbalance: 1 case	- Rod breakage: 8 cases - Proximal foundation failure: 8 cases

	Group 1 (n=14) Distraction every 1 week to 2 months	Group 2 (n=16) Distraction every 3 to 6 months
Length of Distraction per Visit (mm)	≤ 2.64	≤ 3.56

Discussion

- Largest series with longest follow-up to look at the effects of distraction frequencies in MCGR

- **More frequent distractions** are associated with
  - Increased rod distraction failure
  - Increased PJK
  - but lower implant-related complication

- **Less frequent distractions** are associated with
  - Rod breakage
  - Proximal foundation failure

Limitations

- Heterogeneous group of patients
  - Confounding variables (BMI, flexibility of curves, diagnoses)
- Learning curve series
- Different surgical techniques (e.g. maximal correction during MCGR implantation)

Thank you for your attention


The Duchess of Kent Children's Hospital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