THE OXFORD 5 YEAR OBSERVATIONAL STUDY OF 30 PATIENTS WITH MAGNETICALLY CONTROLLED GROWING RODS

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DISCLOSURES

None

INTRODUCTION

- Prospective Cohort Study
- Subjects with Early onset scoliosis
- **Primary Objective** - Evaluate performance and safety of device (Magnetically Controlled Growing Rods) in preventing progression of scoliosis

- **Secondary Objectives**
- Evaluation of clinical outcome
- Assess impact on re-operation rate
- Evaluate complication rates
- Evaluate durability of correction

METHODS

- Submuscular rod insertion
  - 27/ 30 – Dual rods
- 3 monthly distractions
  - 3-5 mm
  - Tail-gaiting principle
  - Dimeglio annual T1-L5 growth velocity

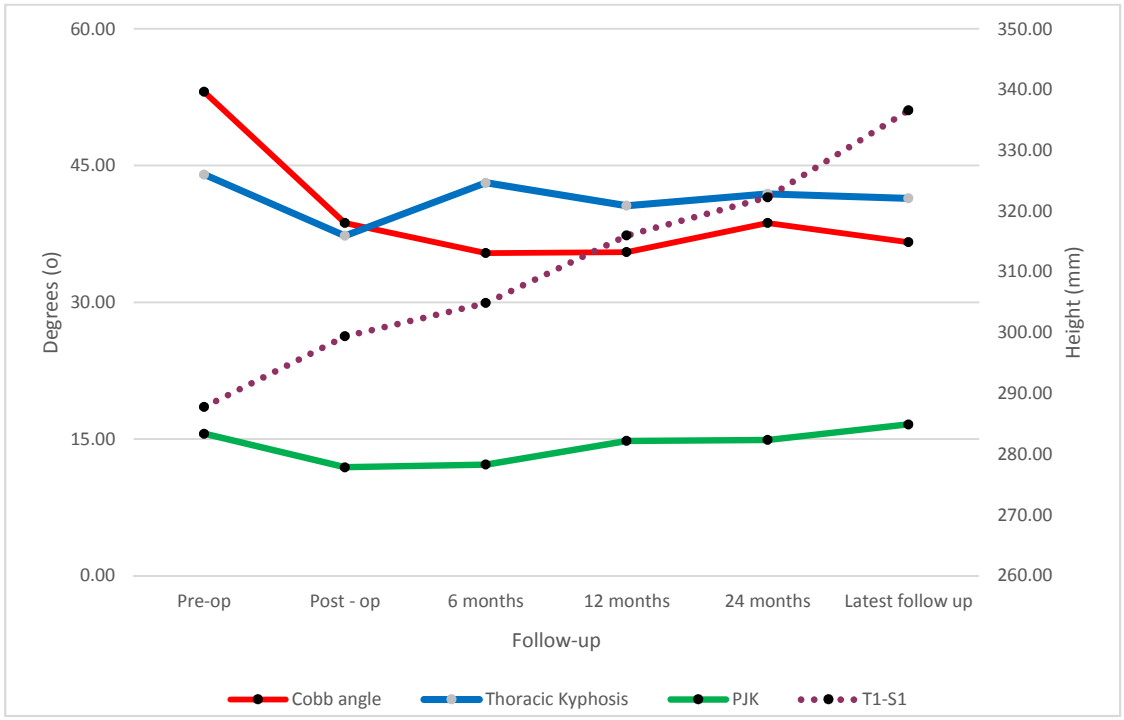
DEMOGRAPHICS

- 30 Patients
- Prospective data collection from December 2011 to October 2017
- 14 M 16 F
- Average age 7.7 (2-14)
- Idiopathic (6) Congenital (3) Syndromic (18) Neuromuscular (3)
- Achondroplasia (2) excluded
- Average Follow up 47 months (24-69)

RESULTS

Timing	Pre op	3 months	6 month	12 mnths	24 mnths	Latest
Cobb	53.1	38.7	35.4	35.5	38.7	36.6 ($p<0.05$)
TK	44.02	37.3	43.1	40.6	41.9	41.4
PJK		11.9	12.2	14.8	14.9	16.6
T1-T12	160.6	170.1	183.4	183.4	182.6	197.6 ($p<0.05$)
T1-S1	287.8	299.4	304.9	316	322.3	336.6 ($p<0.05$)

RESULTS


60.00
45.00
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15.00
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Degrees (o)
350.00
340.00
330.00
320.00
310.00
300.00
290.00
280.00
270.00
260.00
Height (mm)
Pre-op
Post - op
6 months
12 months
24 months
Latest follow up
Follow-up
Cobb angle
Thoracic Kyphosis
PJK
T1-S1

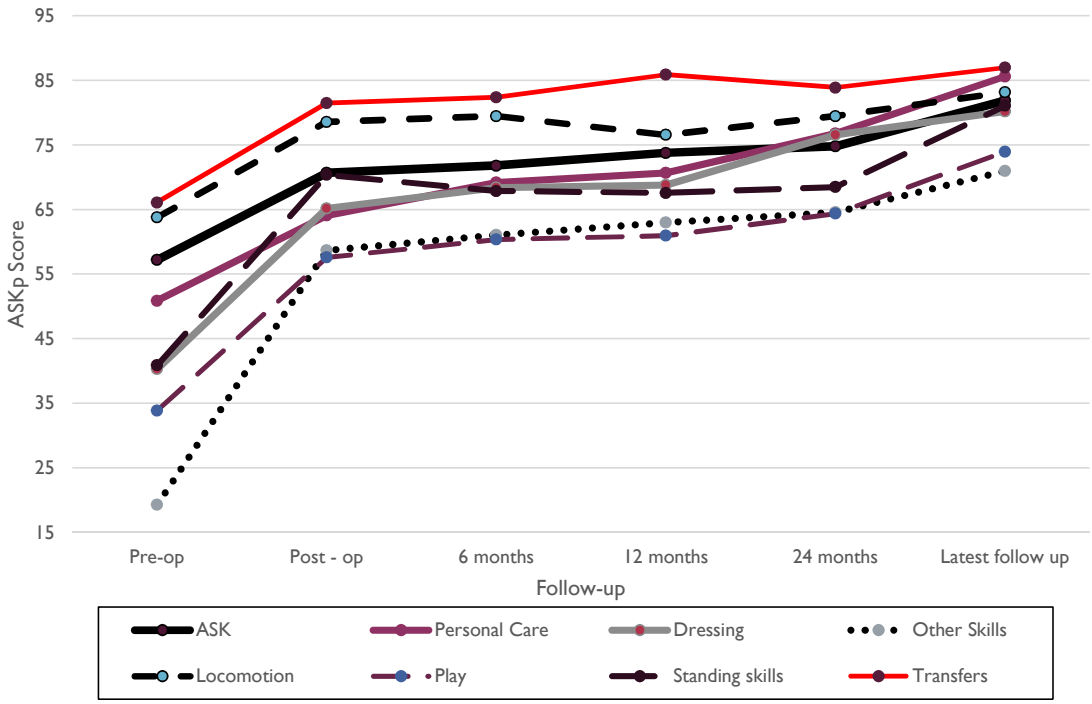
GROWTH PARAMETERS

Timings	No. of pts	Sitting Hgt (cm)	Standing Hgt (cm)	Weight (Kg)
Pre-op	10	71.9	112.7	19.6
Post-op	27	64.2	120.2	25.2
6 months	29	64.4	120.5	25.7
12 mnths	30	66.0	124.0	27.7
24 mnths	30	70.5	129.0	31.1
Latest	30	70.0	136.8	36.1

44% increase in body weight

Sitting/standing height ratio 1:1.95

FUNCTIONAL OUTCOMES



ASK increased across all domains with biggest increase in personal care and standing skills ($p<0.05$)

COMPLICATIONS

	Age	M/F	Diagnosis	Organism	LOS 1	LOS 2	LOS 3	Theatre Visits (including revision)	Date of Diagnosis Of infection	Days from index Surgery
1 C	8	M	Syndrome	1. Staph A 2. Serratia Marcescens	6 d	5 d		2	14.9.16	15 d
2	7	F	Syndrome	Staph A	4 d	5		1	23.9.16	43 d
3 C	8	F	Syndrome	Staph Epidermis	3 d	11 d		2	30.6.16	1642 d (4.5 yrs)
4	13	F	Syndrome	-- ve growth	6 d	7 d	6 d	3	28.7.16	49 d
5 C	10	M	Syndrome	Staph A	5 d	5 d		5	13.2.14	730 d (2 yrs)
6	7	M	Syndrome	Staph A	5 d	15 d		1	15.11.15	10 d

13 Revision cases in the last year (6/13 infections). 0 Infections in primary cases

BROKEN ACTUATOR PIN

Subject	Age	Gender	Diagnosis	Date of Insertion	Time to Revision	Broken Actuator Pin
1	6	M	Congenital	16.7.14	Awaiting	Y
2	11	F	Idiopathic	29.7.13	35 mnths	Y
3	13	F	Syndrome	26.9.12	45 mnths	Y
4	11	M	NF	13.2.13	44 mnths	Y
5	5	M	Idiopathic	2.10.13	Awaiting	Y
6	7	F	Syndrome	22.2.13	33 mnths	Y

Average time to Actuator Pin Breakage 39 mnths

OTHER COMPLICATIONS

Subject	Age	Gender	Diagnosis	
1	13	F	Idiopathic	fusion (loosening of proximal
2	15	F	Syndrome (G mutation)	fusion
3	13	F	Goldenhar Sy	fusion for broken Rod
4	13	F	Neurofibrom	tory Curve
5	11	F	Syndrome	tory Curve
6 C	10	M	Di George Sy	ximal construct
7	13	M	Achondropla	of distal anchor
8 C	11	F	Goldenhar Sy	ximal anchor (SR)

Average time to revision from other complications 28.7 mnths

SUMMARY

PROS

- Revolutionised Rx of EOS
- Obvious psychosocial benefits
- Cost savings (NICE data)
- ↓ Infection rates in 1^0 Surgery
- Importance of growth factors as main outcome measures established
- ?Advantages of targeted distraction principle (Tail-gating) vs Maximum distraction

CONS

- Cost of failure (revision)
- Fear of the unknown (child)
- Device failure
- Metallosis
- Intended distraction vs True distraction
- **High complication rate:**
  - **Infection: 6/13 revision patients**
- **Overall unplanned returns to theatre: 14/30**