Early Perioperative Experience with Phenix Magnetic Growing Rod

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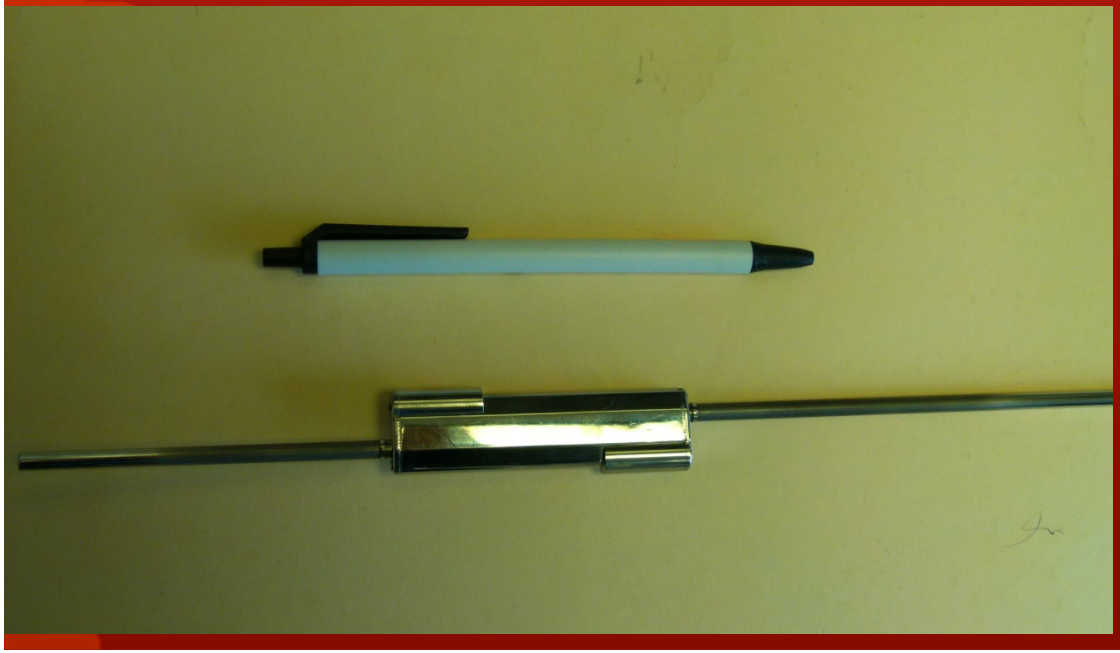
Phenix Magnetic Growing Rod

- Designed and developed by French engineer late Arnaud Soubeiran
- Allows lengthening of the spinal rod device by hand held external magnet

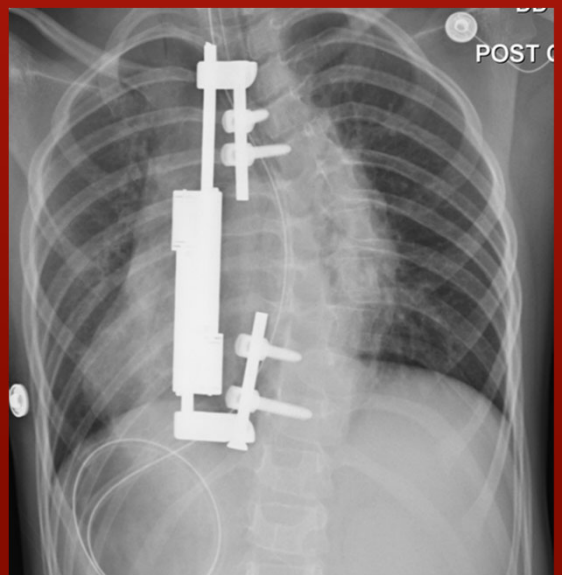


Principles of Phenix rod use for treatment of early onset scoliosis

- **Principle # 1**
- Allows for continuous, ongoing small increment lengthening accommodating both for the spinal growth and gradual curve correction
  - All rod lengthening is done by externally applied magnet and it is done at home by the patient's parents or caregivers

Principles of Phenix rod use for treatment of early onset scoliosis

- **Principle #2**
- Only the structural curve is instrumented (Cobb) leaving the rest of the spine uninstrumented and unrestricted
  - Thus no physical restrictions other than contact sports are placed on the child



Materials and methods

As the device is not approved by FDA in the USA a permission was seeked to use the device on the compassionate grounds for the presented four patients. It was granted by the FDA and the device was imported to the US for each individual patient

Patient	Age (years)	Sex	Diagnosis	Cobb (degree)	Levels Instr'ed
#1	6	male	Coffin – Siris syndr.	78	T6,7 to T12,L1
#2	7	female	Spina bifida	88	T5,6 to T11,12
#3	10	male	Idiopathic EOS	77	T5,6 to L1,2
#4	6	male	NF1 EOS	83	T4,5 to T10,11

Materials and methods

- All patients had several year history of non operative treatment by usual methods of casting or bracing supplemented by halo traction in Patient # 1,3 and 4.
- Conservative treatment has eventually failed in all four them
- The use of Phenix device was extensively discussed with the each family and detailed consent approved by the FDA and our standard hospital consent were signed by the each family

Results

Patient#	OR time	EBL	Immed. Post OR Cobb	Hosp. stay
#1	2hrs 40min	75ml	70	6 days 1 in PICU
#2	2hrs 39min	75ml	62	3 days
#3	2hrs 23min	100ml	56	6 days
#4	2hrs 41min	50ml	49	4 days

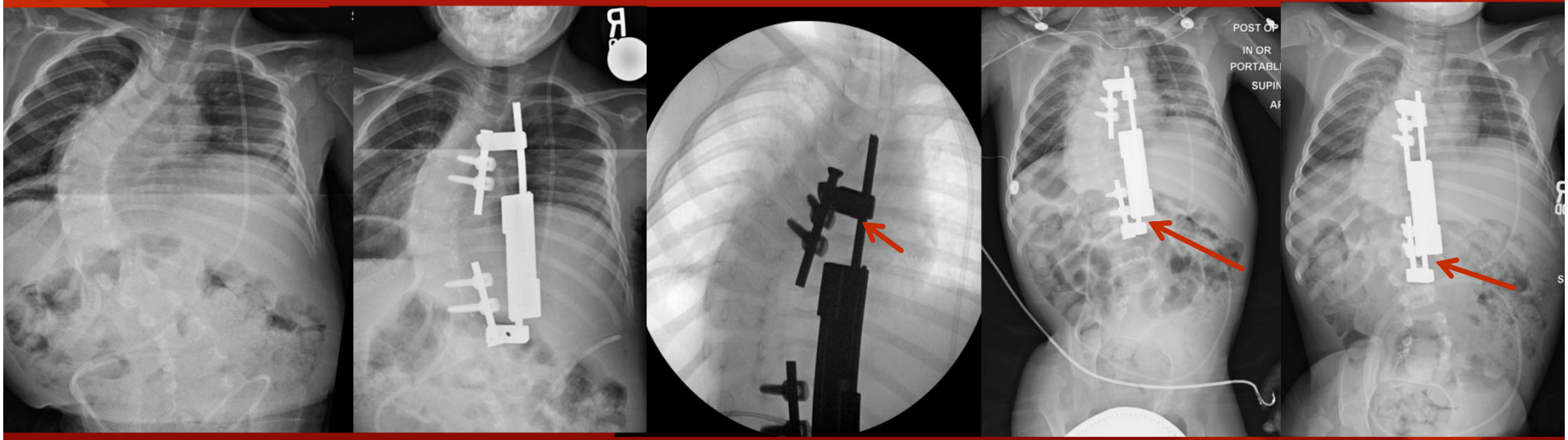
Post operative protocol

- Parents were taught how to use the magnet for the lengthening before hospital discharge
- The lengthening was started at 2 wks post OR with the lengthening protocol of 2 turns of the magnet once a day 5 days out of 7 to obtain optimal initial correction
- Plan is to decrease the lengthening rate to accommodate only the child's growth once maximum correction is achieved

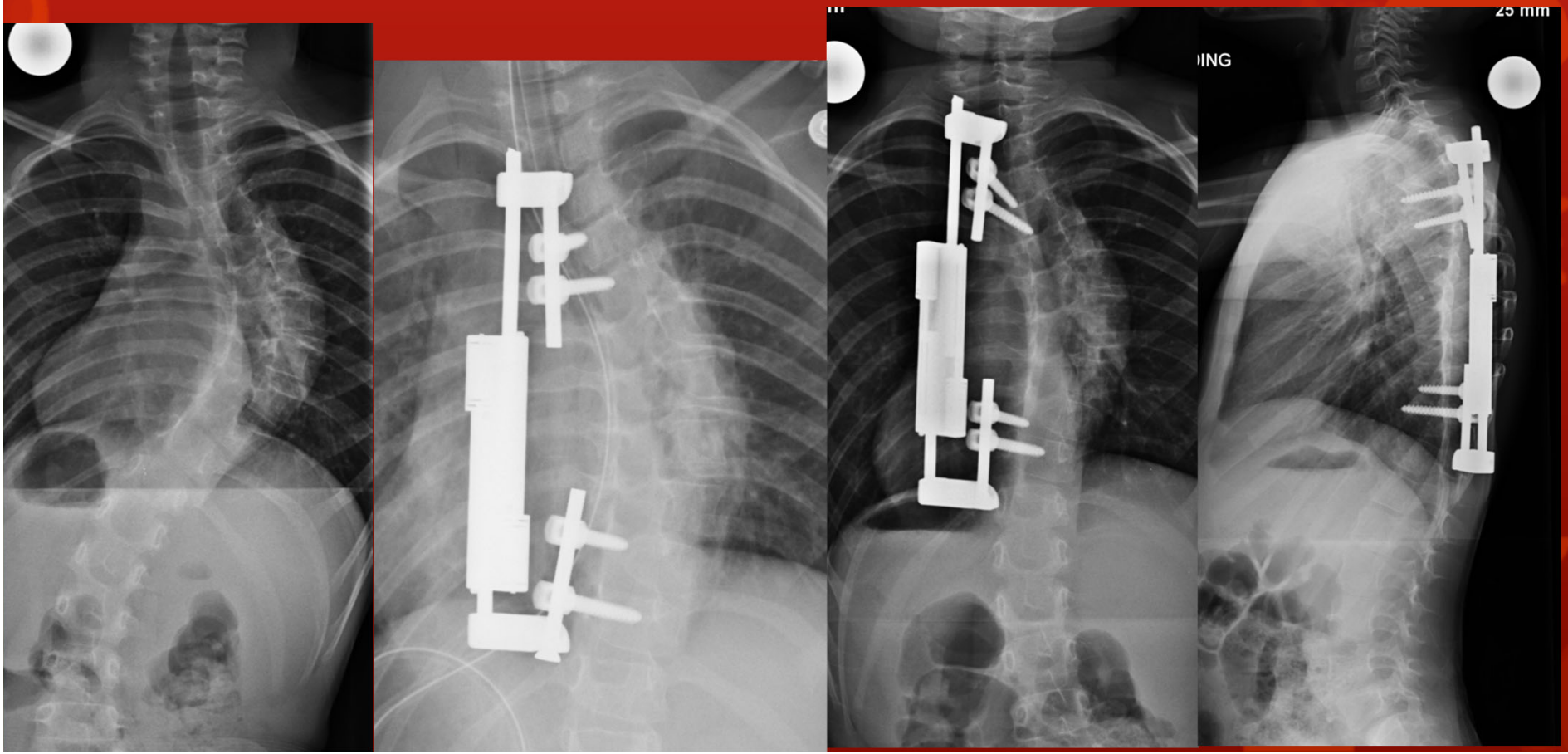
Results

- All patients had uneventful device insertion. The patient #1 spent the first day in PICU as an elective precaution due to severe congenital tracheomalacia requiring difficult intubation
- The patient #3 was a long airplane ride home from our facility and therefore was kept at the hospital an extra couple of days
- All patients had rapid recovery and returned to their preoperative level of activity within 2 or 3 weeks

Pt.#2 had crossbar slippage, corrected by minor revision procedure
Uneventful lengthening on a radiograph 4 weeks later



Pt.#4, pre op, immediate supine post OR view and standing 6 wks later. Note bar lengthening and curvature improvement



Conclusion

- Phenix magnetic spinal growing rod appears to be a safe device fulfilling the expectation placed upon it by the designer’s principles.
- Larger studies and longer follow up is required before the final judgment can be passed as to its effectiveness in treatment of early onset scoliosis in children