

**Single growing rods.
Changing the foundations does it affect the results ?
(Review of 21 cases)**

Growing Spine Study Group

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Why single rod ?

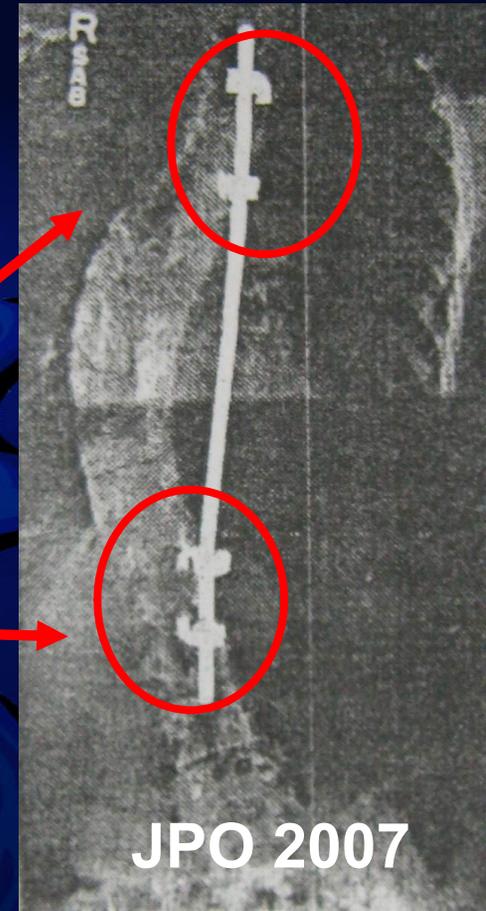
- Less bulky
- Less skin problems (under nourished)
- Convex rod is more prominent under skin
- Convex rod easier to dislodge proximally
- Can be suitable for younger ages
- Leaves a virgin field for final fusion
- Less operative time and blood loss
- The logic is to distract the concave side



The Foundations

Comparison of single and dual growing rod techniques followed through definitive surgery: a preliminary study
Thompson GH, Akbarnia BA, Kostial P, Poe-Kochert C, Armstrong DG, Roh J, Lowe R, Asher MA, Marks DS.
Spine. 2005 Sep 15;30(18):2039-44

Growing rod techniques in early-onset scoliosis
Thompson GH, Akbarnia BA, Campbell RM Jr.
J Pediatr Orthop. 2007 Apr-May;27(3):354-61



The recent studies comparing single and dual rods used:

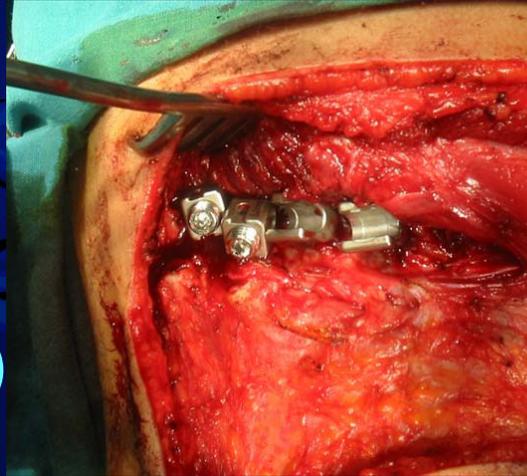
- Single claw proximally spanning 1 or 2 levels
- Hooks or screws distally

“Dual rods offer better results due to better ability to control the spine”

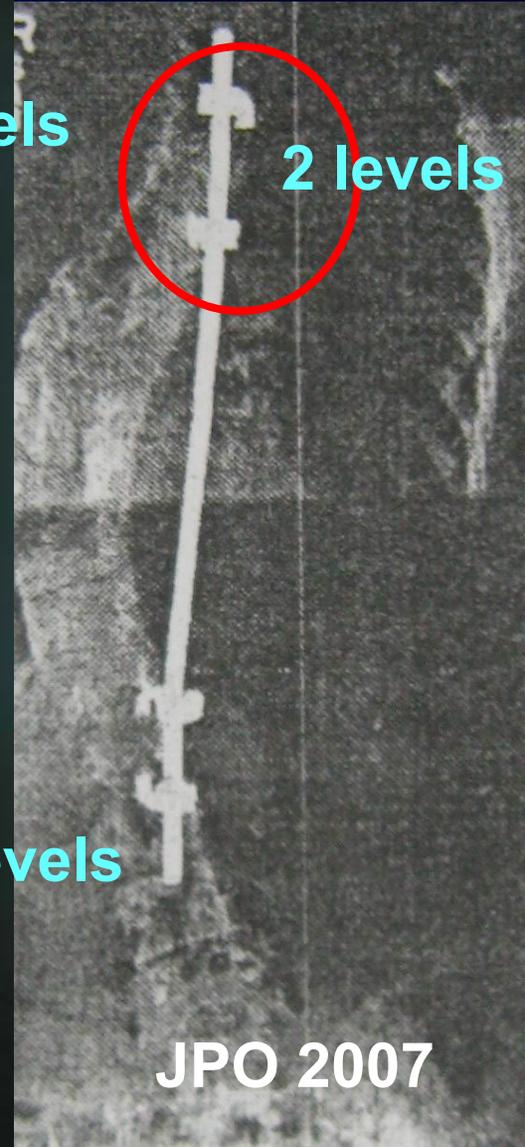
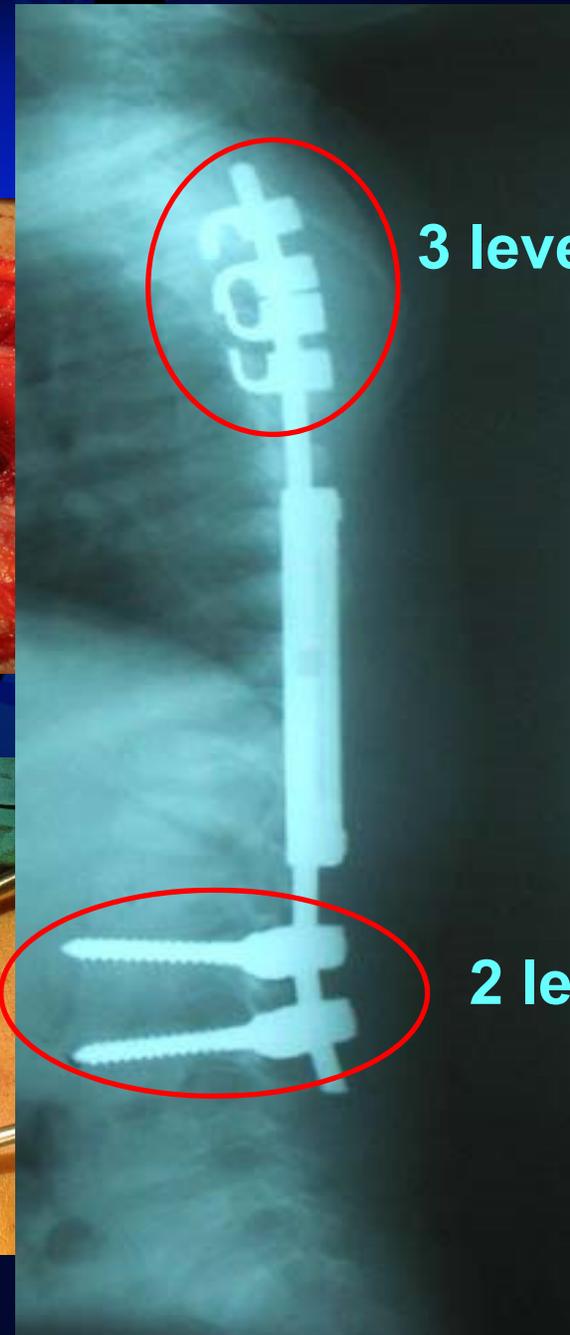
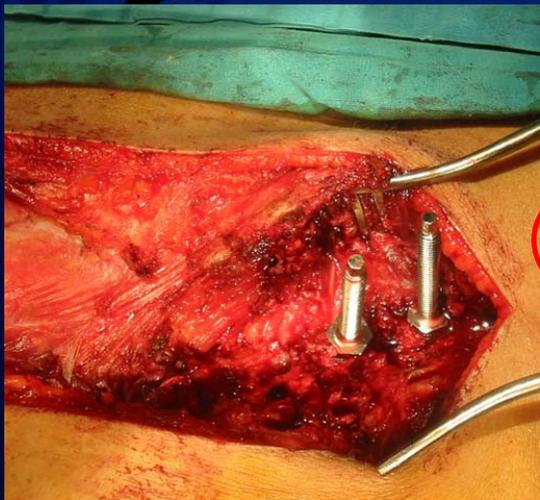
Changing the foundations can it affect these results?

The Foundations

- Proximally:
4 hooks
(double claw,
claw in a claw)



- Distally:
2 pedicle
screws



Methods

Between 2002 and 2007

Abulreish Pediatric Hospital Cairo Egypt

21 patients early onset scoliosis

Average age at surgery 6ys (4-9)

8 had annulotomy

Mean follow up 36 months (12 - 60)

Average 4 distractions (1-9)

Diagnoses:

infantile and juvenile idiopathic scoliosis (13), congenital (3), neurofibromatosis (3), syndromic (1)
post hydrocephalus(1).

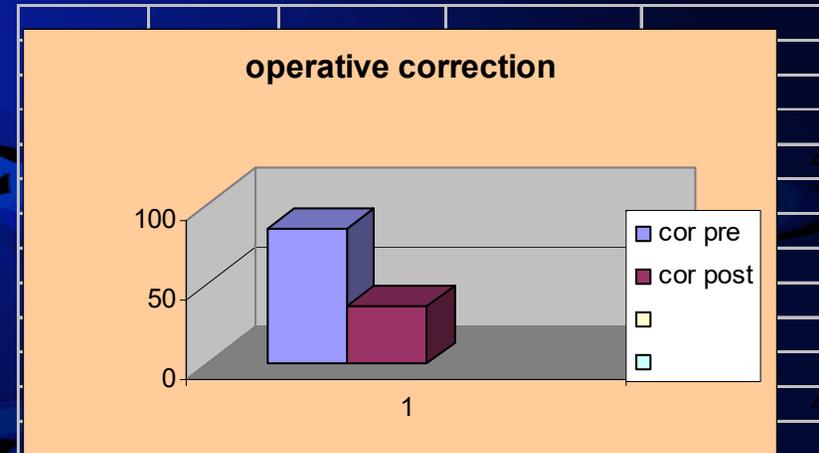
Results

Average coronal Cobb angle preoperatively 85 (45-123)

Average angle latest F Up 36 (11-61)

Percentage of correction **58%**

T1-S1 length increased an average of 1.32 cm per year.



Complications

7 of the 21 patients (30%) , a total of 11 complications

All were implant related including:

- 4 proximal claw pull out

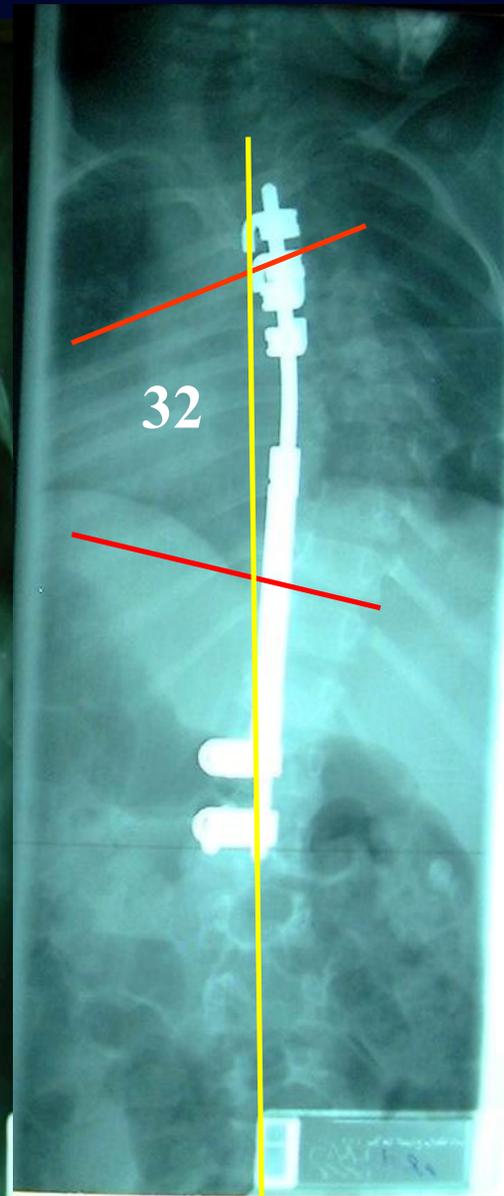
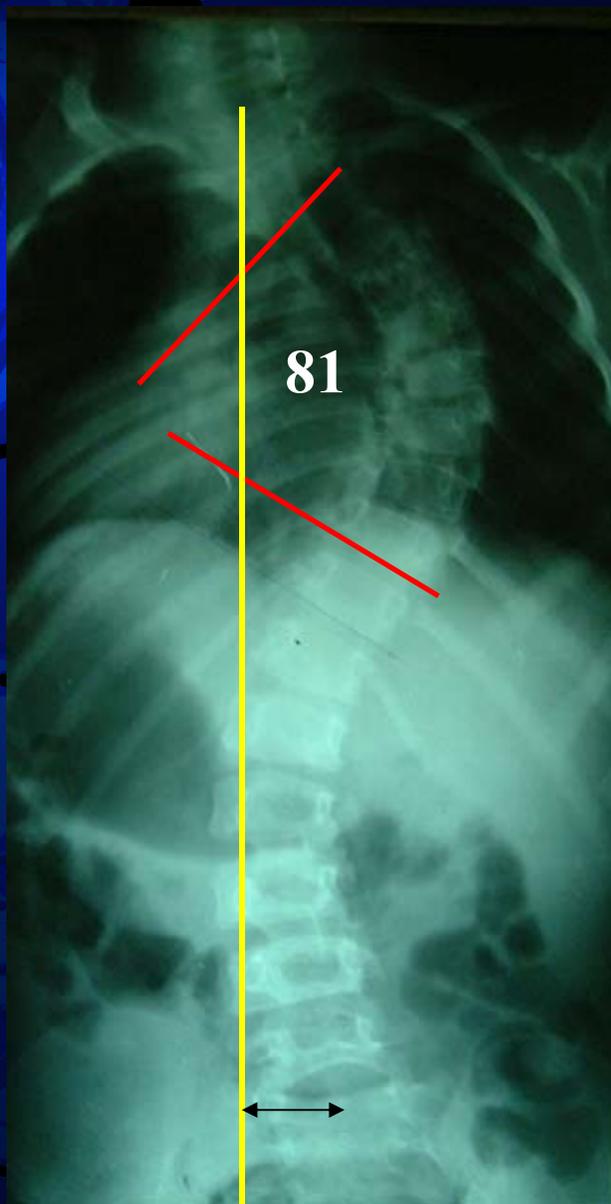
- 5 rod breakage (in 3 patients)

- one loose set screw of the tandem

- one pedicle screw distal migration

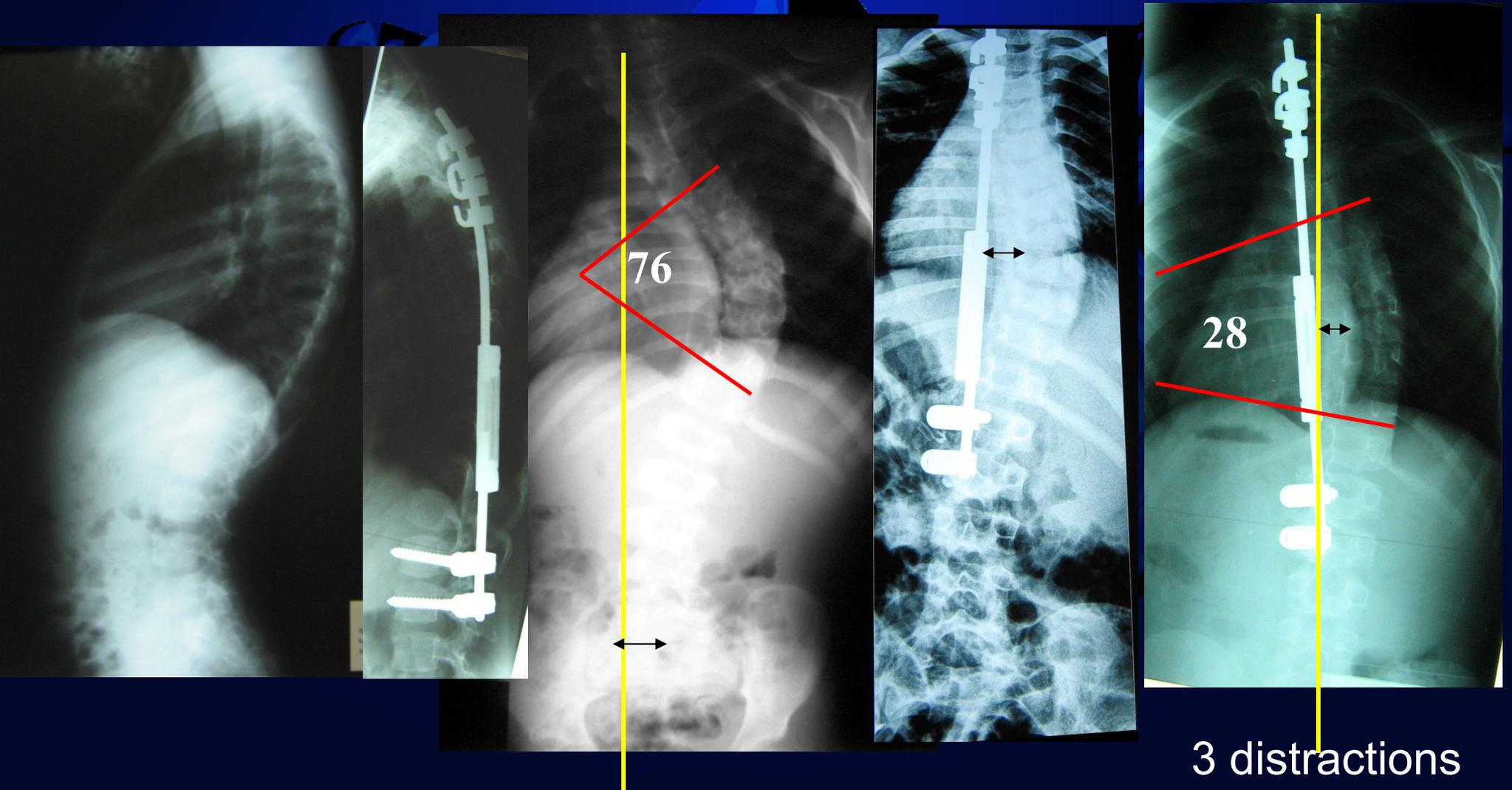
no skin problems, no infections, no neurological complications

Case 1
5 ½ years boy
idiopathic



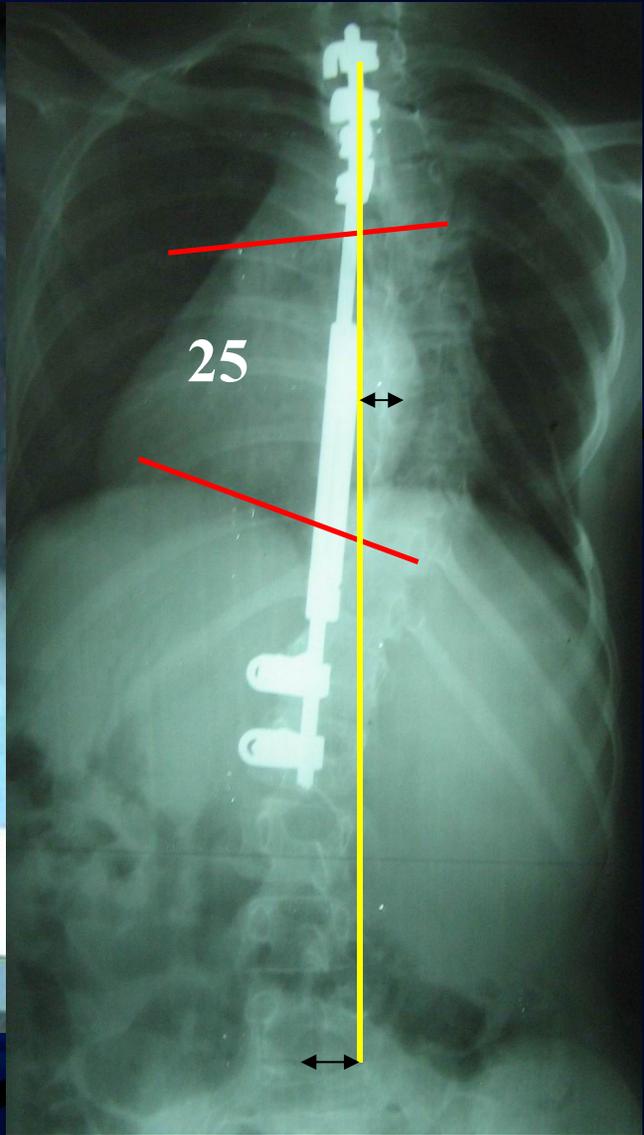
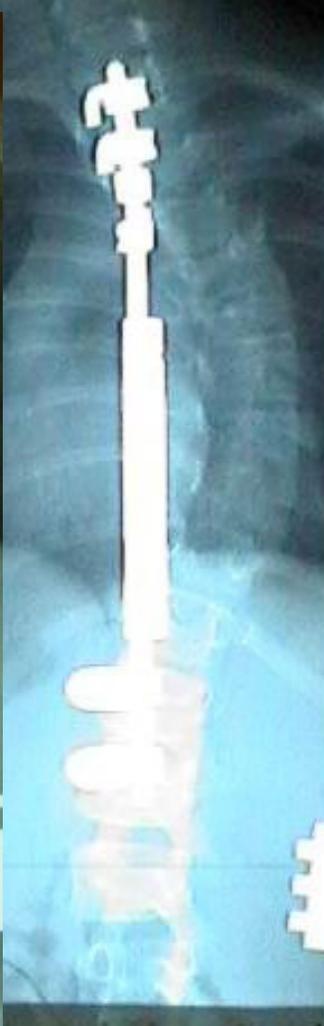
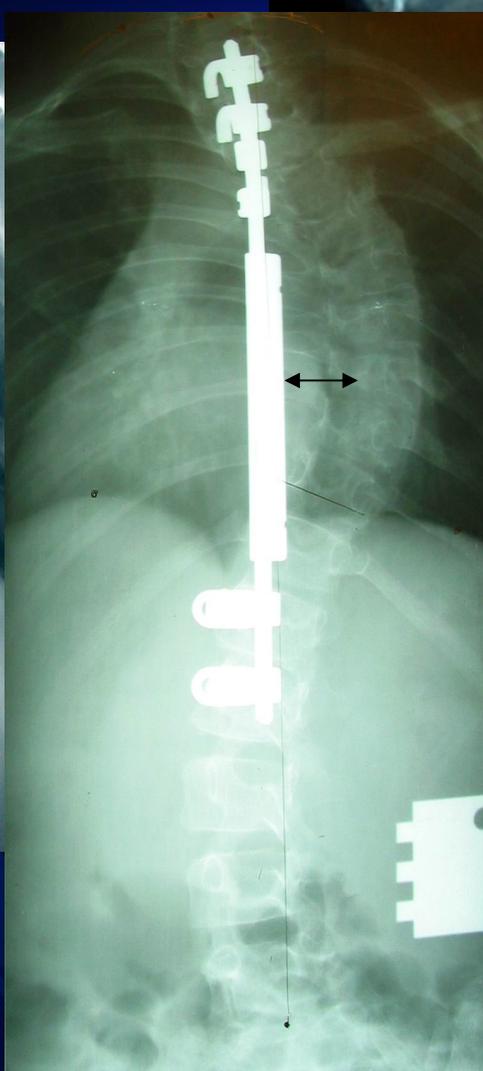
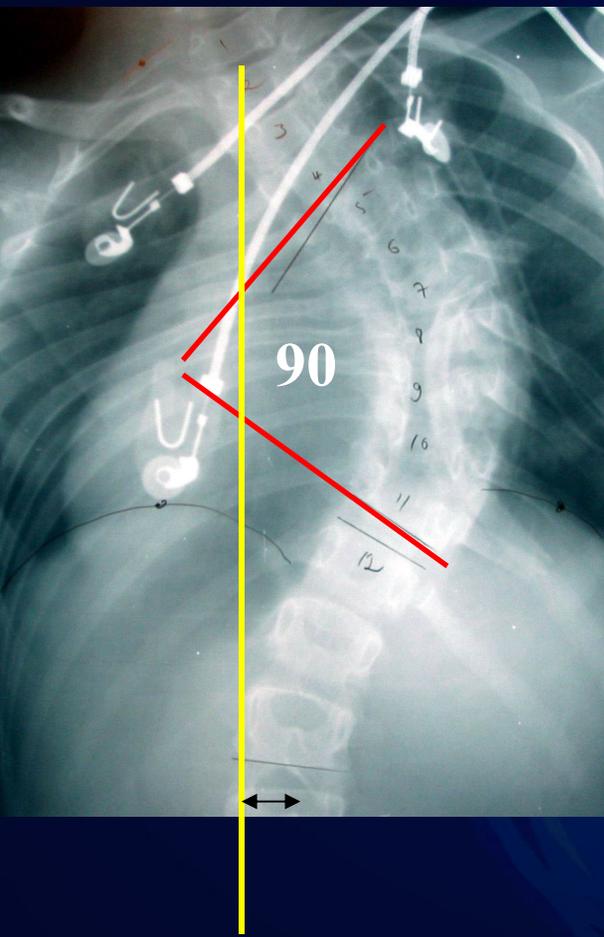


Case 2
4 ½ years boy
idiopathic



3 distractions

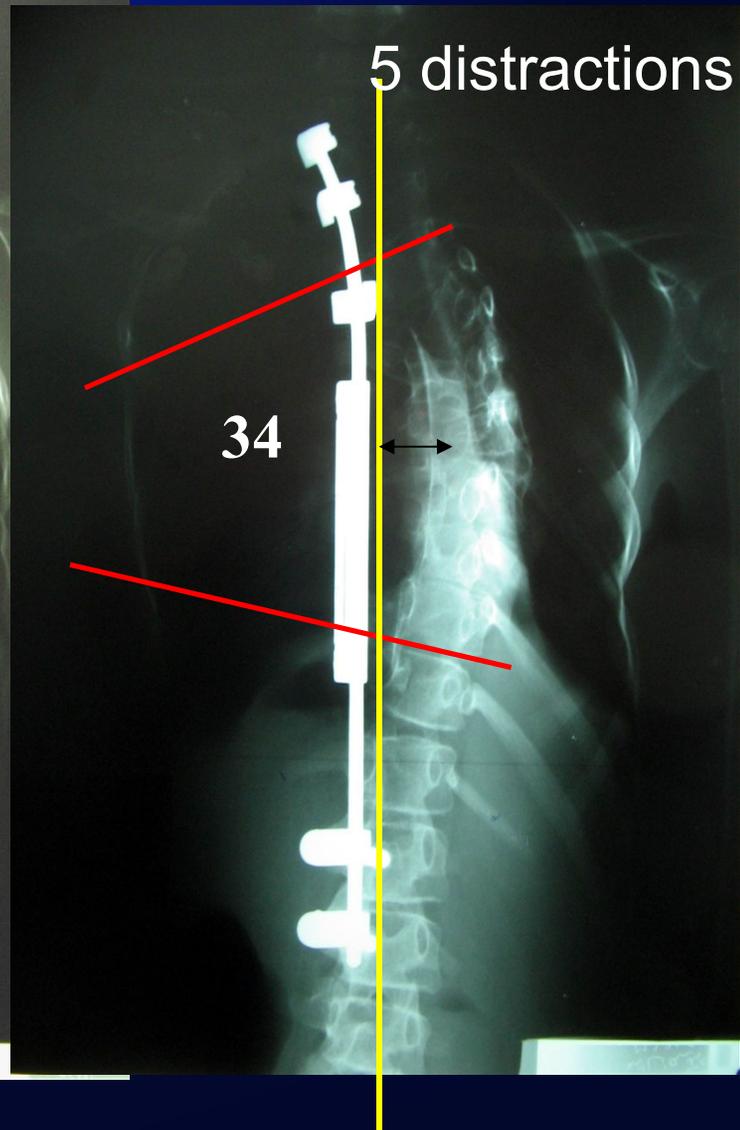
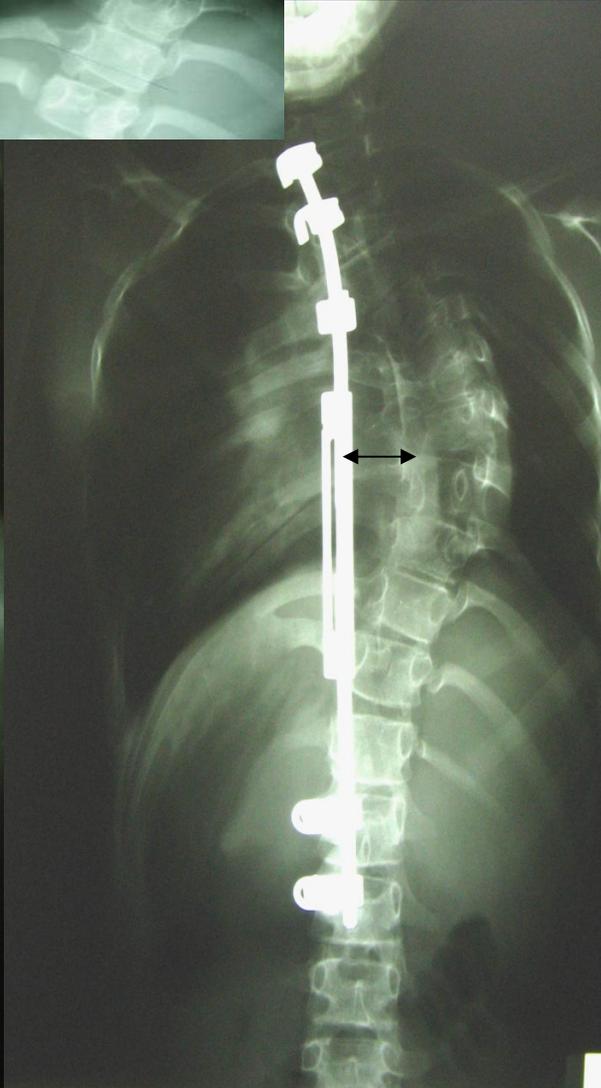
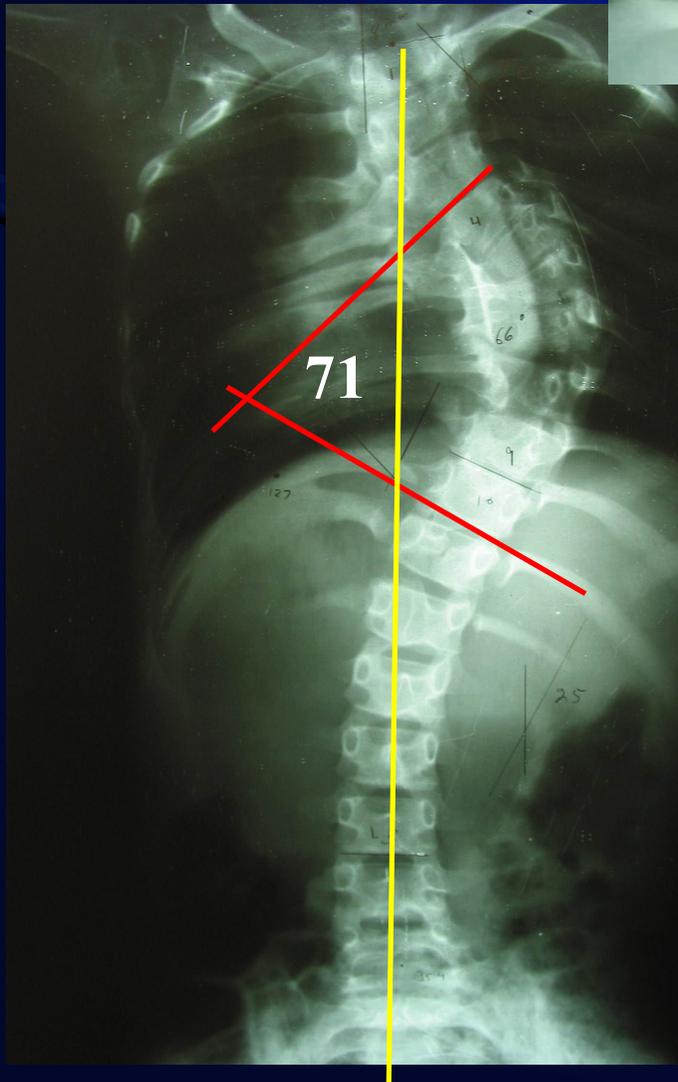
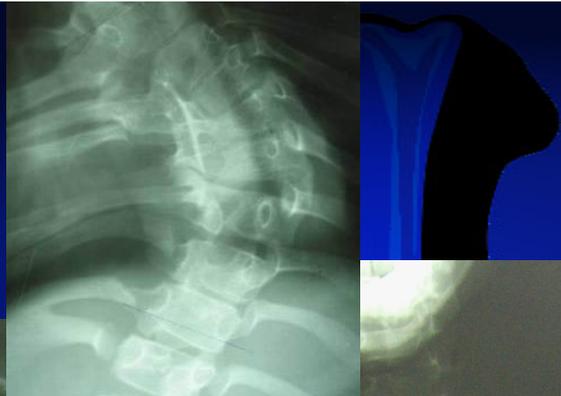




Case 3
6 1/2y ears girl
idiopathic severe curve

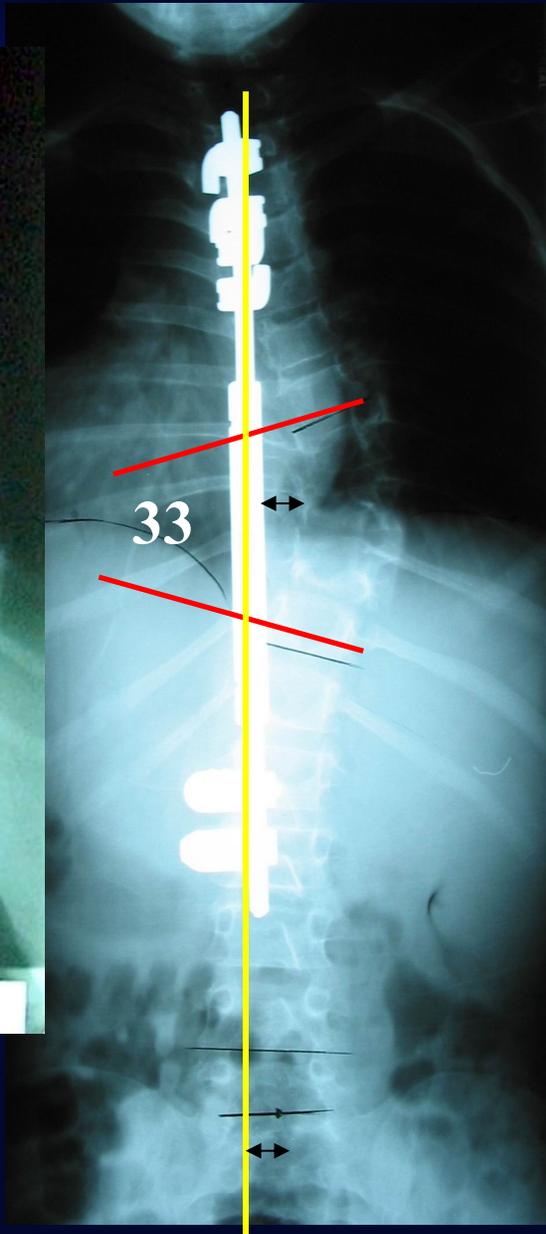
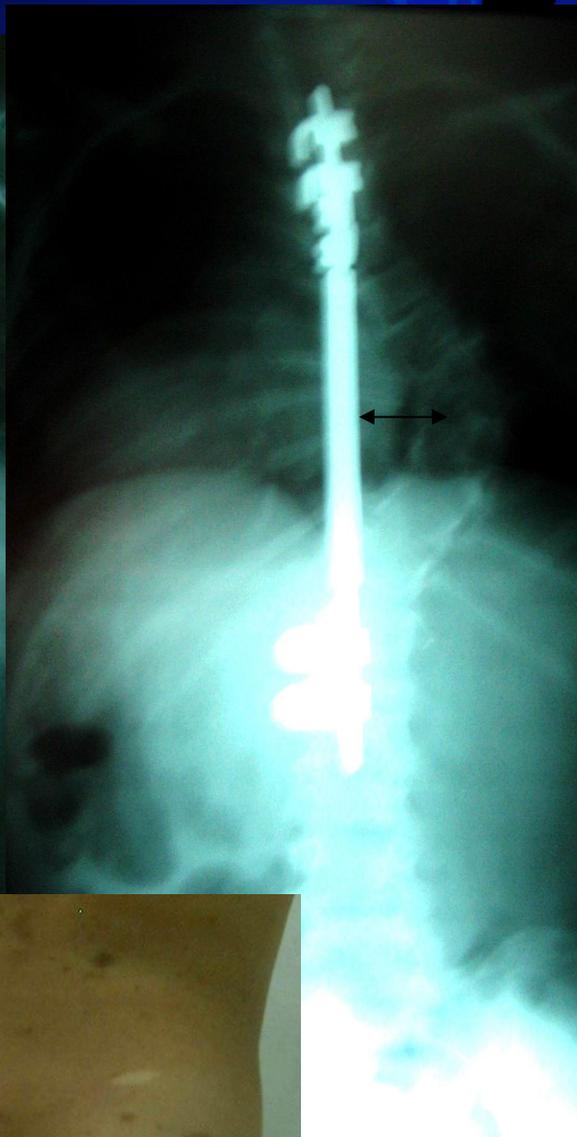
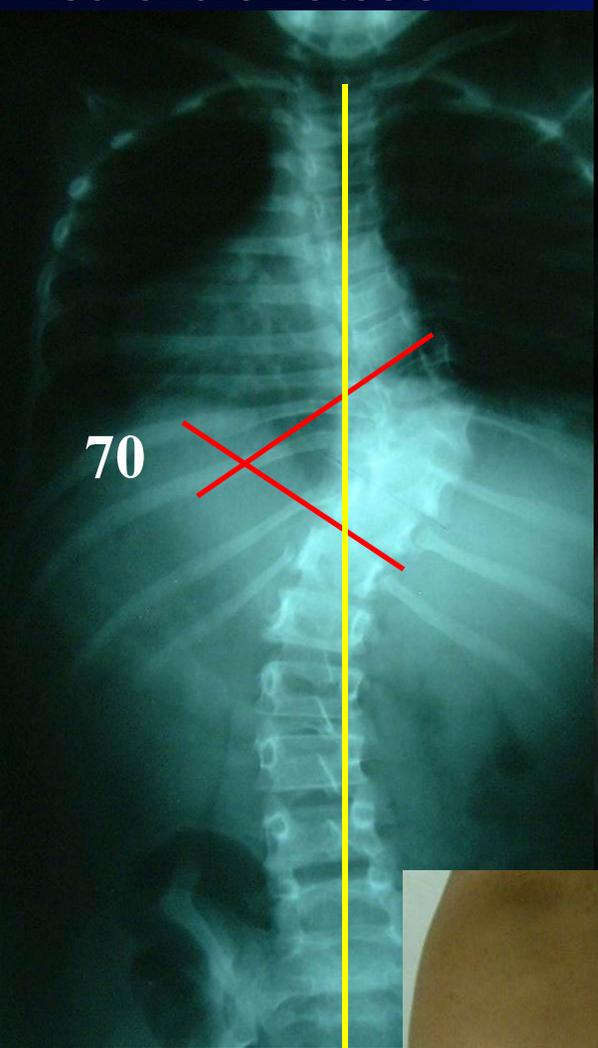
8 distractions

Case 4
71/2 years girl Congenital
Previous attempt
of apical fusion



Case 5
7 1/2 years girl
Neurofibromatosis

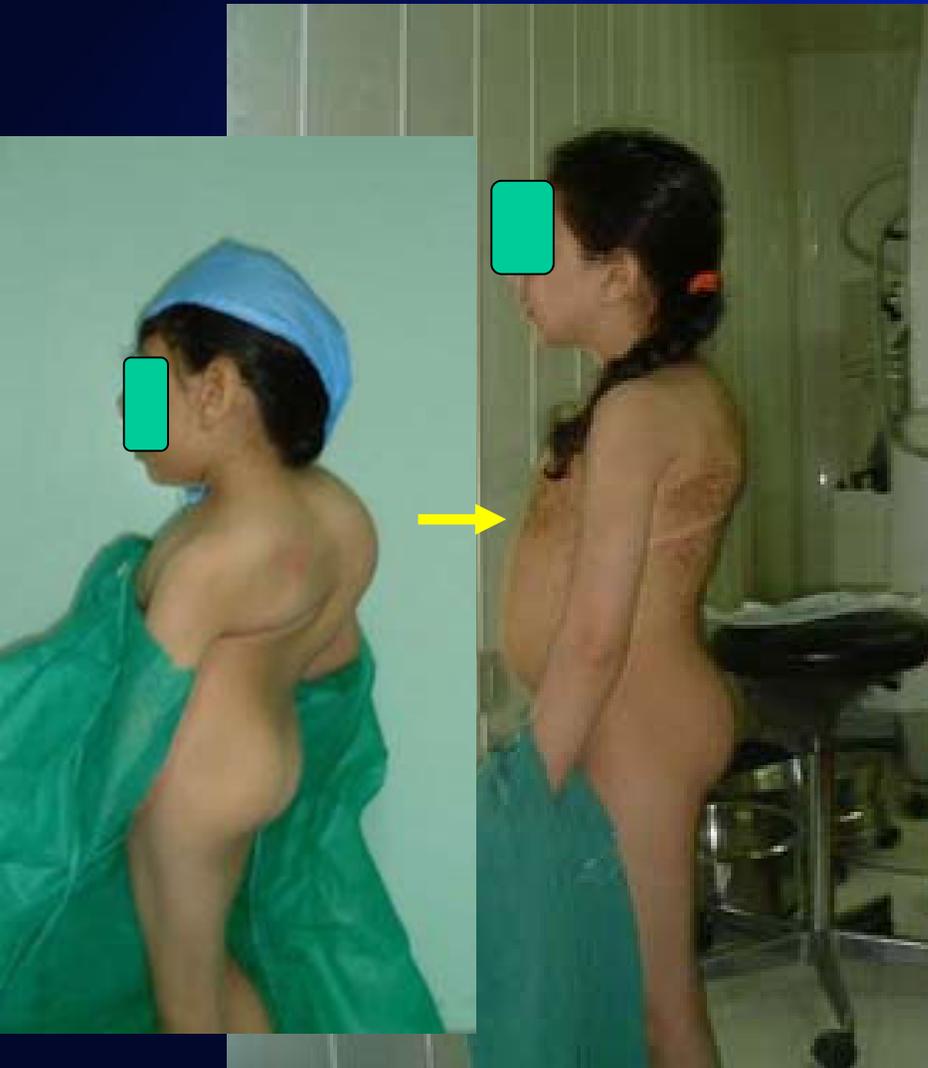
5 distractions



Case 6
6y idiopathic
Had an attempt of limited in situ fusion !!!!!!!
at the age of 3ys



8 distractions



Conclusion

Changing the foundations can improve the results in single rod growing implants.

Despite adding one level to the proximal fusion mass, this construct with single rod has encouraging results with improved outcome, better correction and less complications.

Proper rod contouring, solid fusion around the foundations, routine frequent distractions are crucial in achieving the expected surgical outcome.

Dual rods:

kyphosis (power) ,
double major curves (control) ,
increase body weight with big flexible curves (strength).