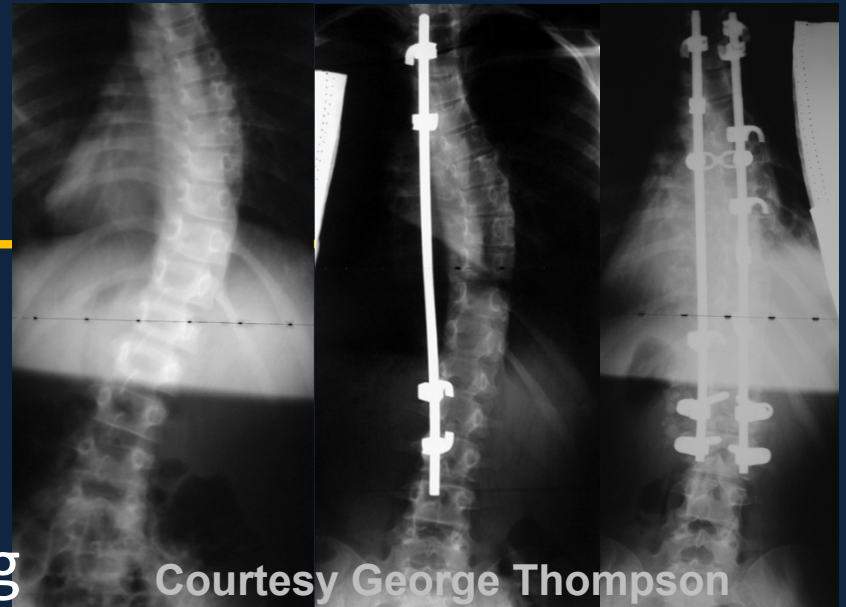


The effect of a new modification of the growing rod technique on the success rate: Distal and proximal pedicle screw fixation, dual rod application and routine lengthening every 6 months

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Growing Rod

- Moe
 - Single rod
 - Multiple lengthening
 - $\geq 10^\circ$ deformity increase
- Single rod
 - Implant related complications
 - Rigid spine
 - Spontaneous fusion(ankylosis)
 - Crankshaft



Growing Rod

- Akbarnia's modification
 - Double rod
 - Cantilever correction
 - Routine lengthening @ every 6 months

Surgical technique



Aim

- To investigate the efficacy and safety of the growing rod technique on a homogenous group of patients from a single institution who had been instrumented with dual rods and pedicle screws on both ends and routine lengthenings performed every 6 months

Materials and Methods

- 03/2004 and 08/2008
- 35 patients
- Exclusion
 - < 24 month follow-up
 - A purely kyphotic deformity
 - The presence of hook fixation as proximal anchors
- Total 21 patients

Materials and Methods

- Variables
 - Pre-index, post-index and post-final follow-up
 - Cobb measurement
 - » Coronal and sagittal
 - AVR
 - Sitting and standing heights
 - Vertebral body heights
 - » Middle segments
 - » Control segments

Results

- 16♀ , 5♂
- Age
 - 66 month (27-105)
- Follow-up
 - 36 month(24-47)
- Lengthening
 - 4.71 (3-7)

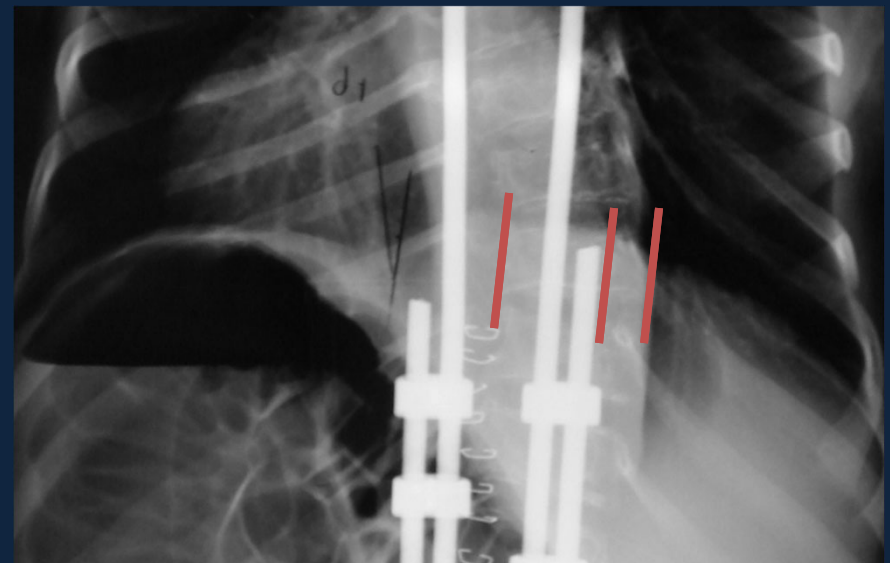
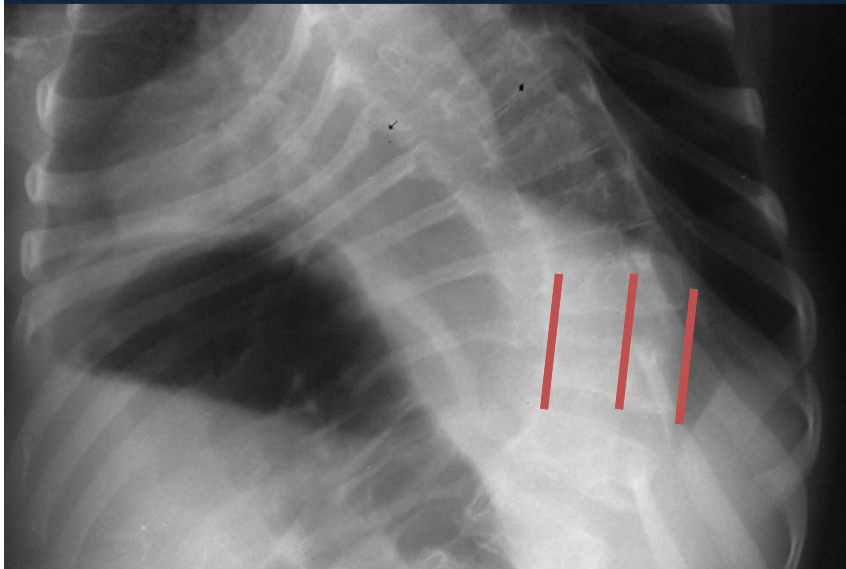
Results

| | Pre index(°) | Post index (°) | % | Post final(°) | % |
|----------------|--------------|----------------|----|---------------|----|
| Scoliosis | 58.8(25-98) | 24.2(6-46) | 59 | 26.8(8-52) | 54 |
| Rotation | 20.8(0-45) | 15.8(0-40) | 24 | 13.5(0-25) | 35 |
| T3-12 Kyphosis | 39.8(16-90) | 22.5 (10-50) | | 23.3 (8-48) | |



Results

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Results

- Sagittal plane
 - Hyperkyphosis
 - All restored
 - Hypokyphosis
 - Insufficient restoration



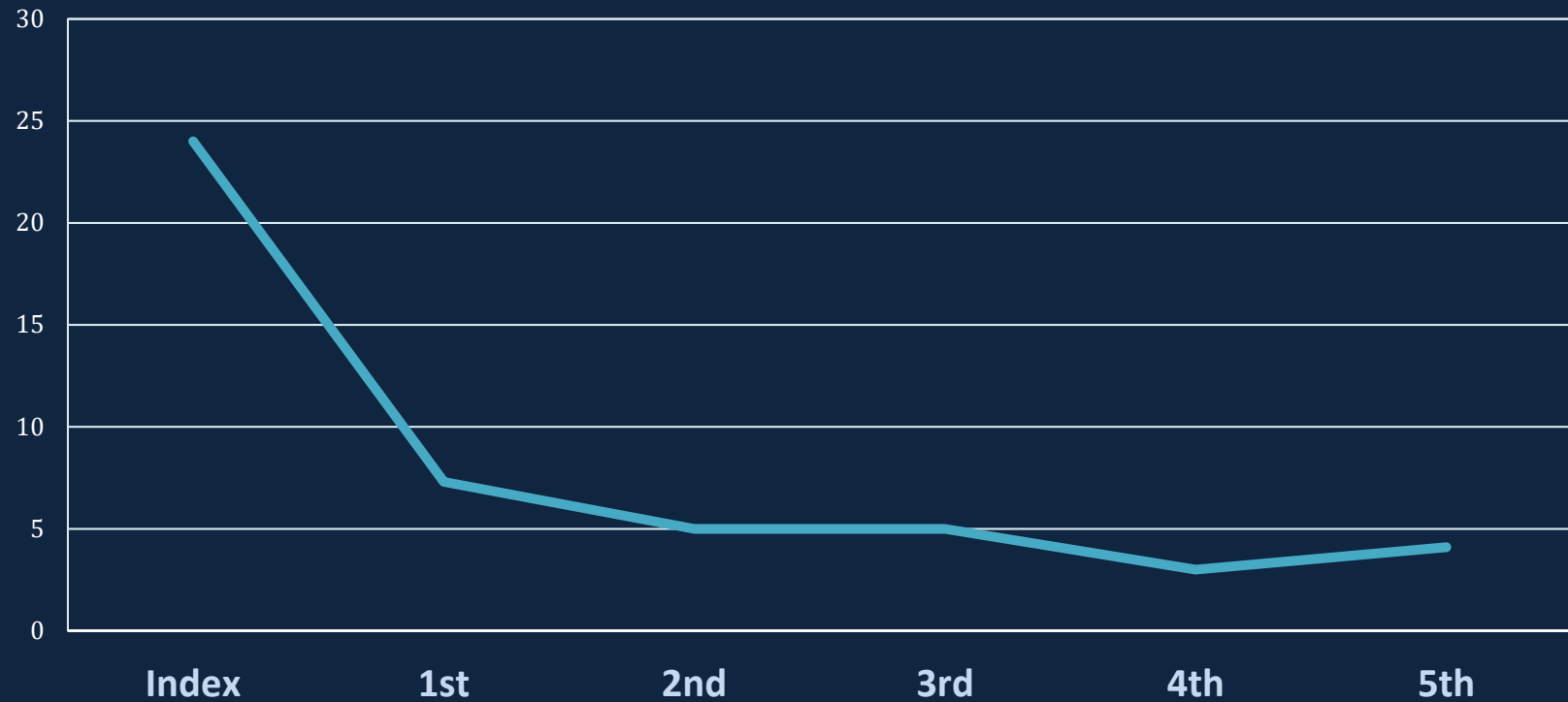
Results

- Growth
 - Sitting height : 28.3mm/year (15-45)
 - Standing height: 52.5mm/year (20-115)



Results

Growth pace



Results

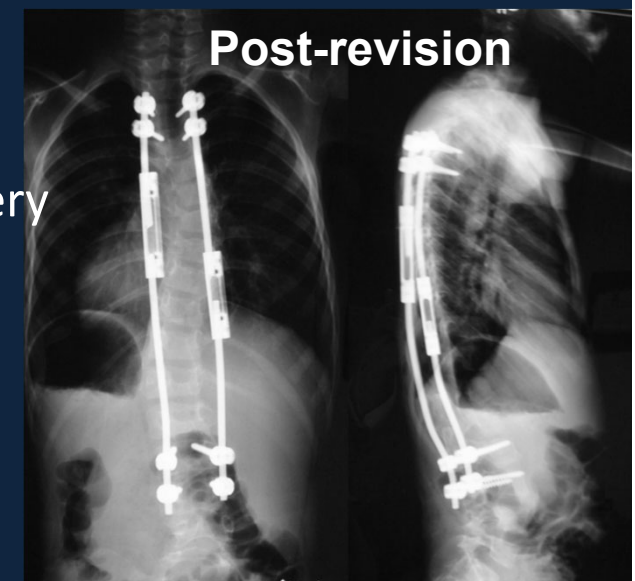
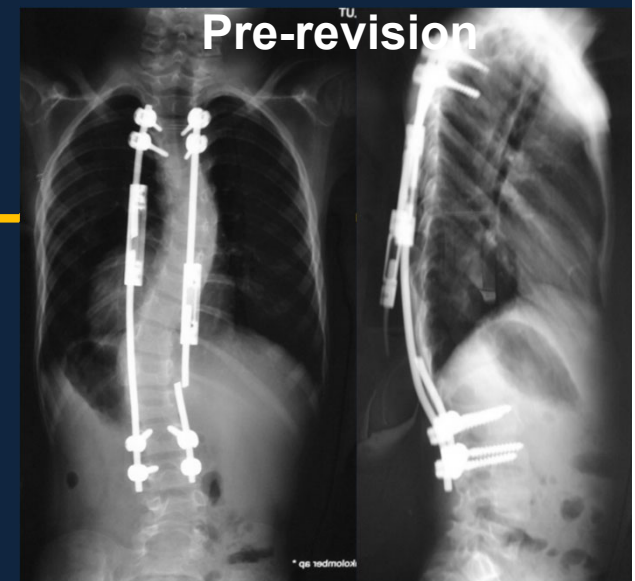
- Vertebral body growth
 - Control segments
 - Pre- index 18.2 mm (14.5-23)
 - Post FU 19.9 mm (17-22)
 - Uninstrumented (middle) segments
 - Pre- index 15.8 mm (12.5-20)
 - Post FU 18 mm (14-24.5)

$P > 0.05$



Results

- No neurological complication
- Skin breakdown 1
- Rod breakage 3
 - Revision@ planned surgery
- Screw loosening 2
 - Replacement with bigger ones@ planned surgery
- No unplanned surgery



Conclusion

- 3D correction of deformity
 - Except hypokyphosis
- Low complication rate
- Pedicle screw at both ends
 - Better deformity control
 - Less complication
- Preservation of growth potential
 - Constant growth pace
 - Lengthening @ every 6 months





Obama,
we love you

You're the man
who is going to change
the fate of the world