

Is thoracic expansion a safe procedure for mobility and growth potential of the spine?

Spontaneous anterior fusion after multiple chest distractions in young children

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Disclosure

- Caglar Yilgor No disclosure
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Background

- TE is claimed to be a spine-sparing procedure
 - Spine is not exposed directly
 - Intervention towards the spinal column is not performed
- Recent trends
 - In cases of primary spine deformities without rib fusion/aplasia
 - Where the primary problem is not in the thorax itself

Aim

- To report spontaneous spinal fusion
 - After multiple thoracic distractions
 - Without any spinal interventions

Material & Methods

- May 2003 – March 2010
- Thoracospinal deformities
- 11 patients in total
- Lengthening procedures for 7 of them are ongoing

- Study includes
 - 5 patients who had a 3D-CT scans at latest FU
 - 4 → as a part of the graduation protocol
 - 1 → a newly formed bony fusion of ribs was observed in a lengthening procedure

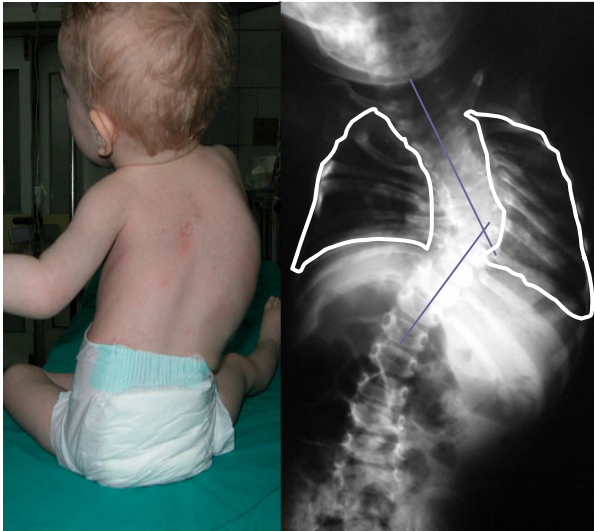
Material & Methods

- 4F, 1M
- Mean age at index surgery → 4.2 (2–8)
- Mean number of lengthenings → 10.2 (7–13)
- Mean follow up → 73 mos.(60–96)

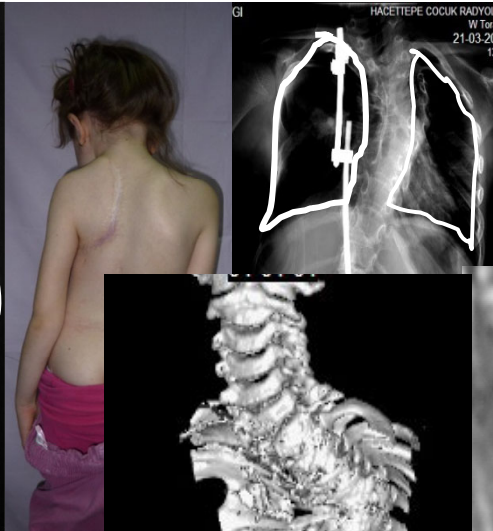
Pt.	Age at index surgery and latest fu	Pre-operative X-ray findings of spinal column	Locomotor examination	Previous surgery	Pre-op. standing height(cm)	Pre-op. Cobb angle	Number of length.	Final standing height (cm)	Final Cobb angle
# 1	2 10	T4-T5-T6 hemivertebrae Limited fusion in the concave side of T7-T8	Pelvic obliquity and shoulder imbalance No deficiency in the motor or sensory exam	Operated for diastematomyelia by the neurosurgeon six months prior	87	T1 – T8 70°	13	125	T1 – T8 46°
# 2	3 10	T4-T5 hemivertebrae	Shoulder imbalance and right thoracic hump No deficiency	None	95	T1 – T7 56°	7	123	T1 – T7 44°
# 3	6 12	T5 hemivertebrae with unilateral bar and fused ribs	Pelvic obliquity and shoulder imbalance, deformity in the chest and right thoracic hump No deficiency	None	101	T1 – T8 50°	8	131	T1 – T8 37°
# 4	8 13	T5-T6 hemivertebrae and unsegmented bar	Shoulder imbalance and right thoracic hump No deficiency	None	110	T1 – T9 54°	9	138	T1 – T9 34°
# 5	2 7	T4-T5 hemivertebrae	Shoulder imbalance and pectus carinatum No deficiency	None	88	T1 – T8 44°	10	113	T1 – T8 34°

Results

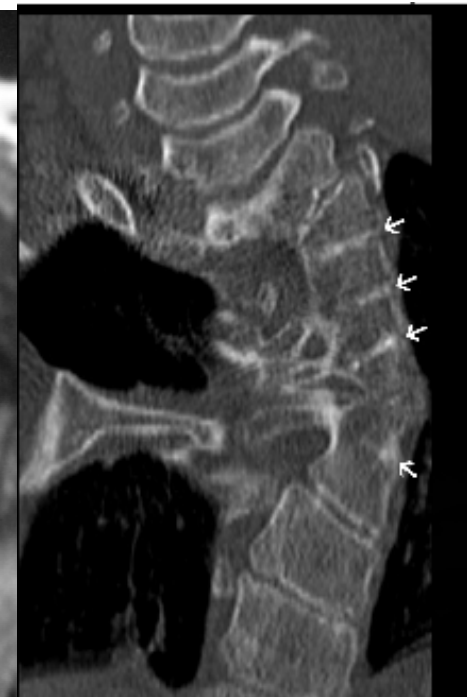
- In none these 5 patients
 - Rib breakage
 - Thoracic outlet syndrome
 - Brachial plexus palsy
 - Skin problems or infections that required surgery
- In one patient
 - Re-fusion was developed at the previously osteotomized ribs
 - Osteotomy was repeated at the 5th lengthening
- CT scans confirmed spontaneous spinal fusion in the thoracic spine
 - In all 5



2 years old
70°



10
13





3 y
56°





6 years old
50°

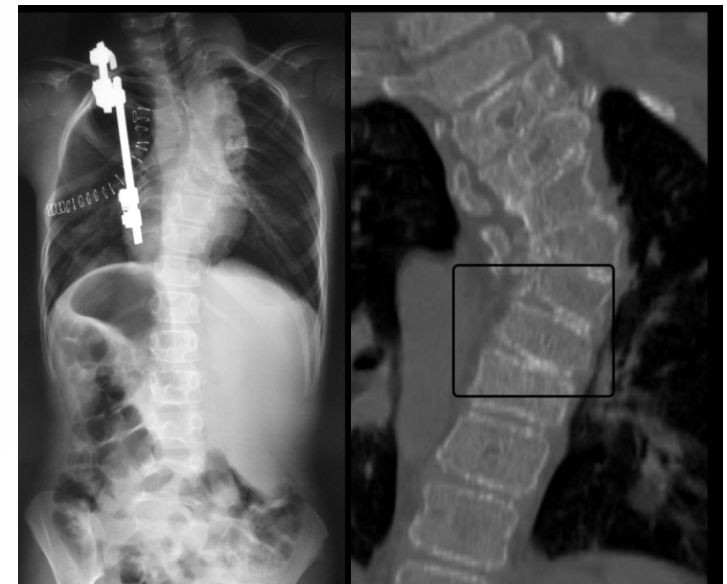
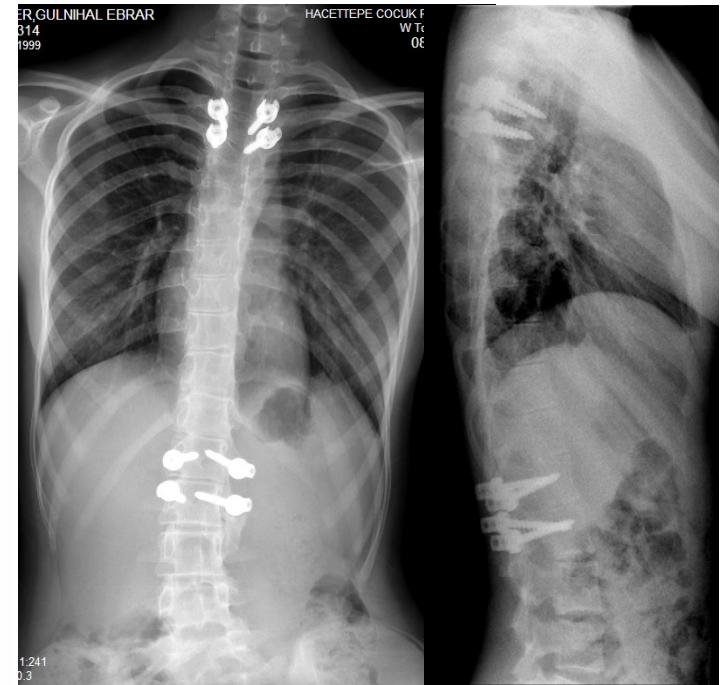
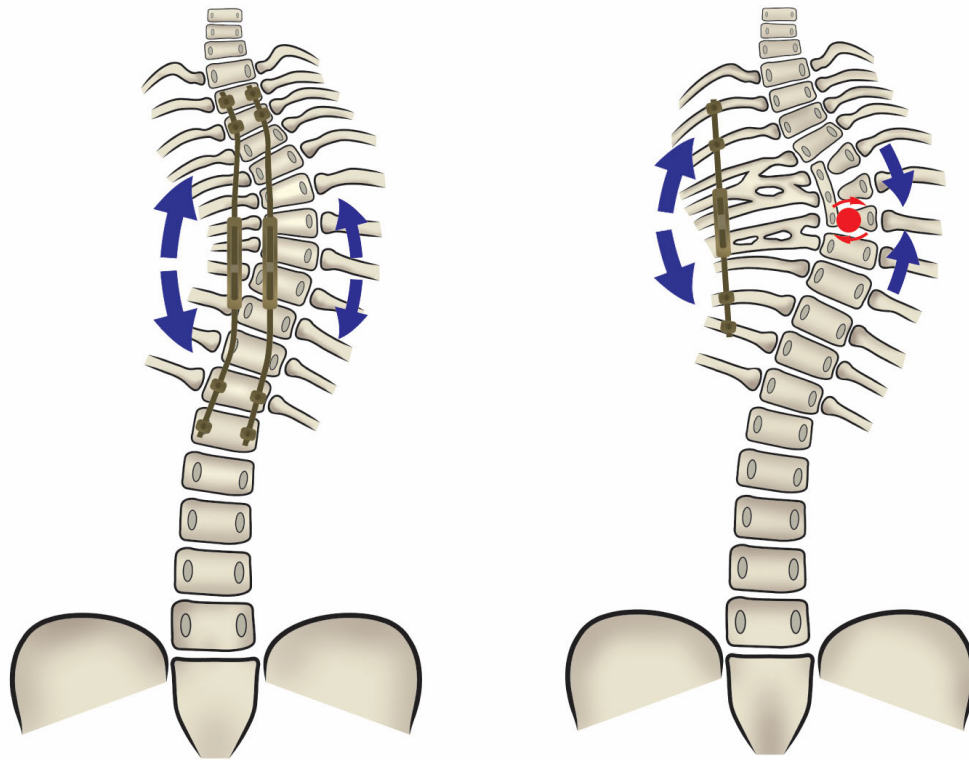


Drawbacks

- Small case series
- A part of series
- Thoracic expansion, no
- Not all had preop CT



Conclusion



Conclusion

- Spontaneous fusion cannot be extrapolated to all TE patients
- Distraction-based growth-friendly instrumentations are not risk-free for spinal health and motion, even when the instrumentation is not primarily on the spine