POSTERIOR HEMIVERTEBRA RESECTION AND SHORT SEGMENT FUSION WITH PEDICLE SCREW FIXATION FOR CONGENITAL SCOLIOSIS IN CHILDREN YOUNGER THAN 5 YEAR; WITH MINIMUM 8 YEARS FOLLOW-UP

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Paper #6 POSTERIOR HEMIVERTEBRA RESECTION AND SHORT FUSION WITH PEDICLE…

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PURPOSE

To evaluate the spinal canal development *with preoperative and follow-up CT scans* and to assess the surgical outcomes of children *before age 5* who underwent hemivertebrectomy and bilateral pedicle screw fixation.

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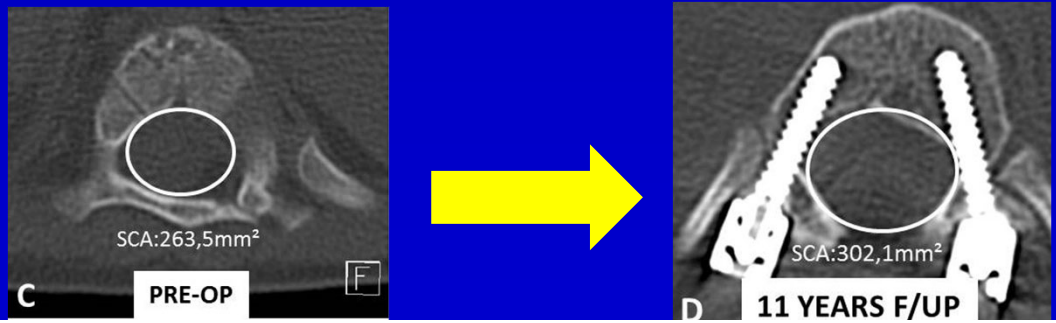
MATERIALS & METHOD

- ✓ ***Inclusion criteria*:**
- ✓ **Age at surgery less than 5 years**
- ✓ **Posterior hemivertebra resection with bilateral pedicular screw instrumentation**
- ✓ **Short segment fixation**
- ✓ **Having preoperative and follow up CT scans**
- ✓ **Min. 8 year follow/up**
- ✓ **After care : all pts placed in spica cast 6 months and in brace 6 months**



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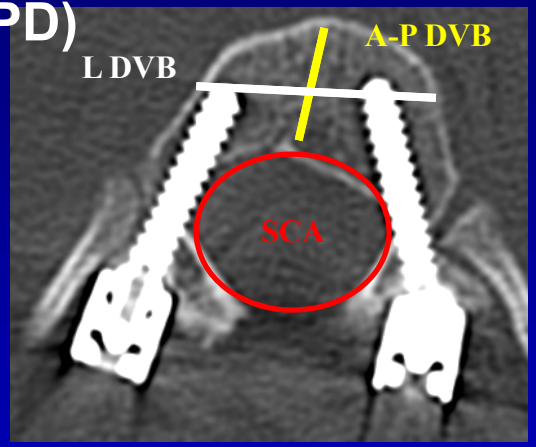
- ✓ *In each case*;

- ✓ Coronal and sagittal parameters were measured with st. Xrays.
- ✓ Antero-posterior diameter of vertebral body (APD)
- ✓ Lateral diameter of vertebral body (LD)
- ✓ Right and Left Pedicle Width
- ✓ Right and Left Pedicle Length
- ✓ Right and Left Pedicle Height
- ✓ Spinal canal area (SCA)



were measured with low dose CT scans at the instrumented vertebrae as well as the uninstrumented ones above and below them to evaluate and compared with sa corresponding levels.

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MATERIALS & METHOD

- ✓ 2 HV thoracic spine (T1-T11)
- ✓ 5 in thoracolumbar spine (T10-L2)
- ✓ 3 in lumbar spine (L3-L5)
- ✓ 5 patients had congenital scoliosis and 5 patients had congenital kyphoscoliosis deformity
- ✓ 7 patients had single and 3 patients had double hemivertebrectomy (ipsilateral, consecutive).

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RESULTS

- ✓ 6 females + 4 males ; 10 pts.
- ✓ Mean age at the time of surgery was 3y4m (1y7m – 4y4m).
- ✓ Mean follow-up was period 8y5m years (min. 8 years- max. 11 years)
- ✓ Mean age was at the final follow-up was 11y (9-15)
- ✓ 2 patients had more than 10 years follow/up

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RESULTS

- ✓ Preop mean Cobb angle 29,1° (23-32) to 5,3°(4-11) %81 correction rate
- ✓ Kyphoscoliosis group LCA 24,4°(12-40) 3,8° (2-11) %84 correction rate
- ✓ Normal sagittal alignment was restored and maintained . (Mean SVA : +4,2 mm)

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RESULTS

Comparison of preop and final CT scans, showed proportional increase for all vertebral body and spinal canal parameters and did not show any iatrogenic spinal canal stenosis or growth retardation.

Table: Vertebral body and spinal canal parameter measurements

Measurements (mm) (Mean)	UAV			UIV			LIV			LAV		
	Pre-op	F/up	*p*	Pre-op	F/up	*p*	Pre-op	F/up	*p*	Pre-op	F/up	*p*
APD	13,42	17,75	**0,028**	12,96	17,23	**0,028**	13,4	17,27	**0,028**	14,39	18,46	**0,028**
LD	22,07	26,43	**0,028**	22,8	28,08	**0,028**	23,39	28,63	**0,028**	23,59	30,59	**0,028**
RP width	4,32	5,66	**0,012**	5,22	6,01	0,016	5,81	8,65	**0,012**	7,1	8,67	0,069
LP width	4,73	6,07	**0,011**	5,4	6,05	0,058	6,32	9,67	**0,012**	7,78	9,17	**0,012**
RP length	30,75	35,25	**0,012**	29,28	32,9	**0,012**	30,75	34,4	**0,012**	32,06	36,2	**0,012**
LP length	31,12	35,01	**0,012**	29,81	33,37	**0,012**	30,78	34,62	**0,012**	31,92	35,8	**0,012**
RP height	7,4	9,36	**0,012**	6,8	8,25	**0,012**	6,41	8,17	**0,012**	8,37	10,6	**0,012**
LP height	7,2	9,27	**0,012**	6,98	8,45	**0,012**	6,42	8,35	**0,012**	8,22	9,85	**0,012**
SCA (mm^2)	235,1	287,3	**0,012**	238,4	288,5	**0,012**	262,7	308,9	**0,012**	263,2	302,4	**0,012**

UAV: Upper adjacent vertebra, UIV: Upper instrumented vertebra, LIV: Lower instrumented vertebra, LAV: Lower adjacent vertebra, APD: Antero-posterior diameter of vertebral body, LD: Lateral diameter of vertebral body, SCA: Spinal canal area, RP: Right pedicle, LP: Left pedicle.

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RESULTS

- No adding-on deformity was seen at final follow-up.
- Pseudoarthrosis or implant failure was not detected.
- There were no pedicle screw malposition, pull-out finding or screw loosing at the instrumented levels.
- All patients had solid fusion anteriorly across the cage and also posterior facet fusion.
- There were no neurological or implant related complications.

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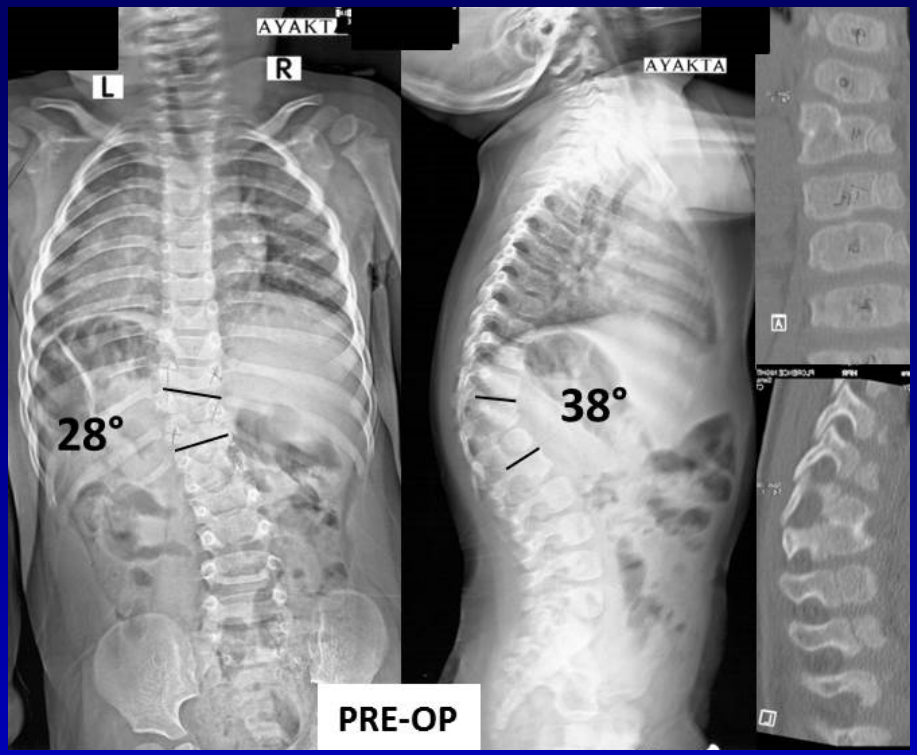
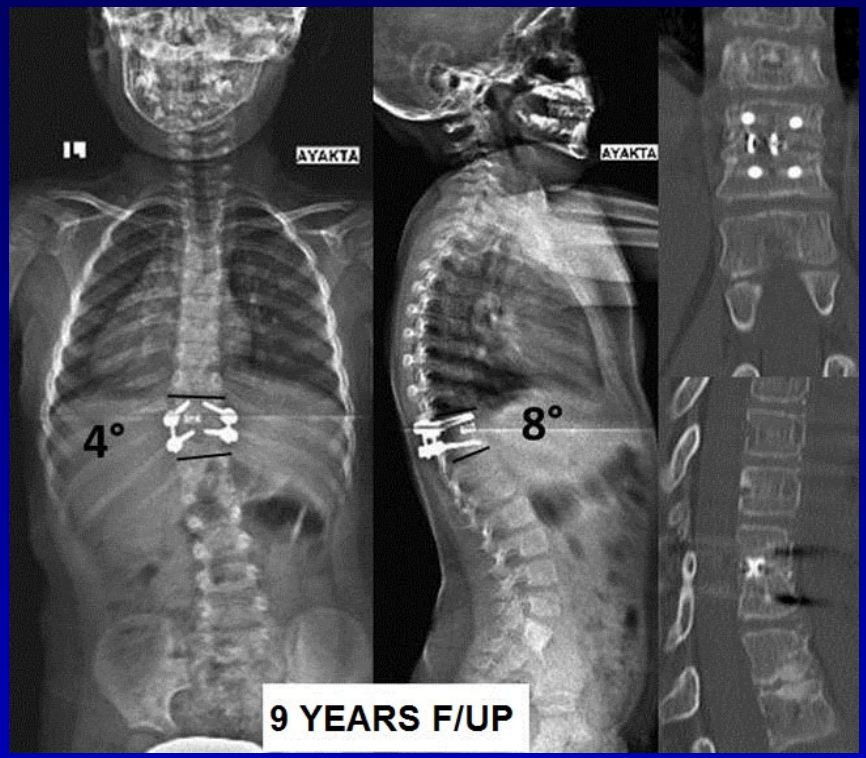
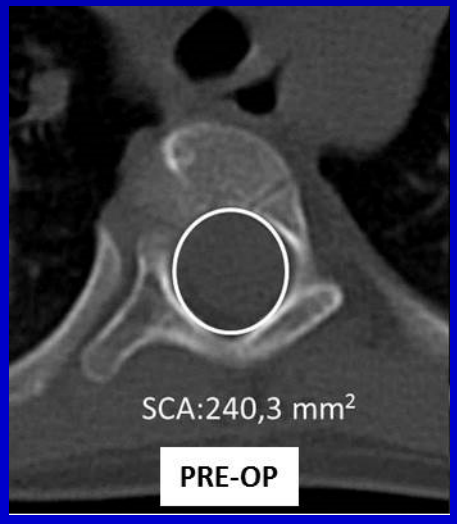
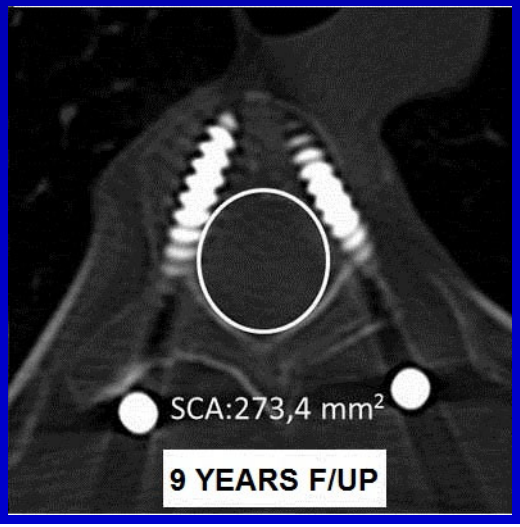
EES, 3y4m, M









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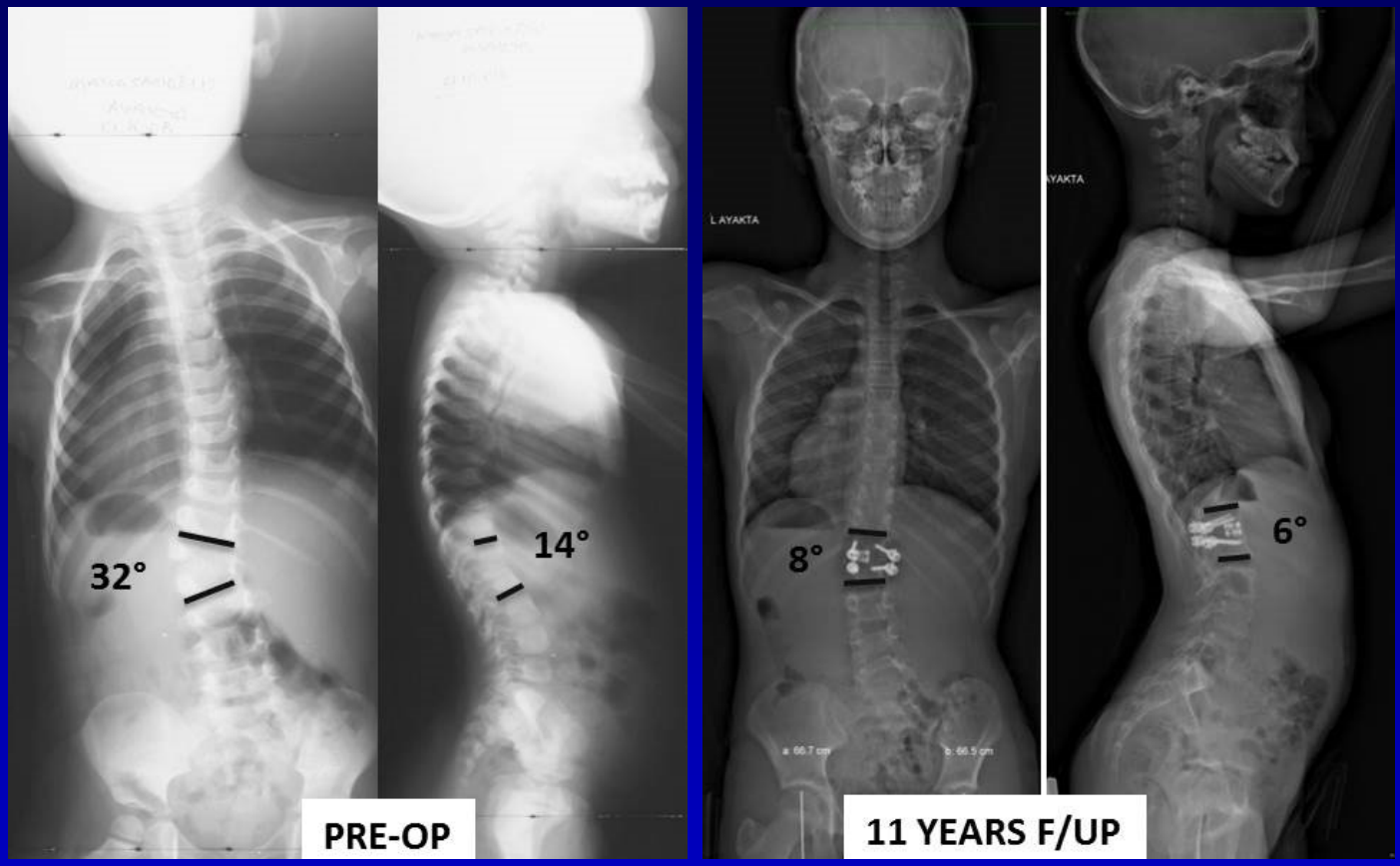
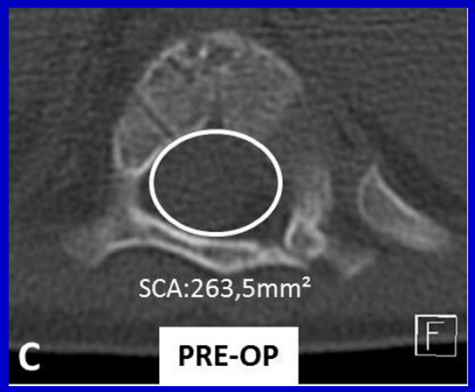
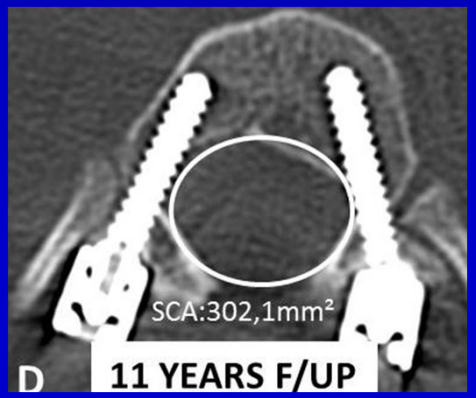
MS, 2y6m, F







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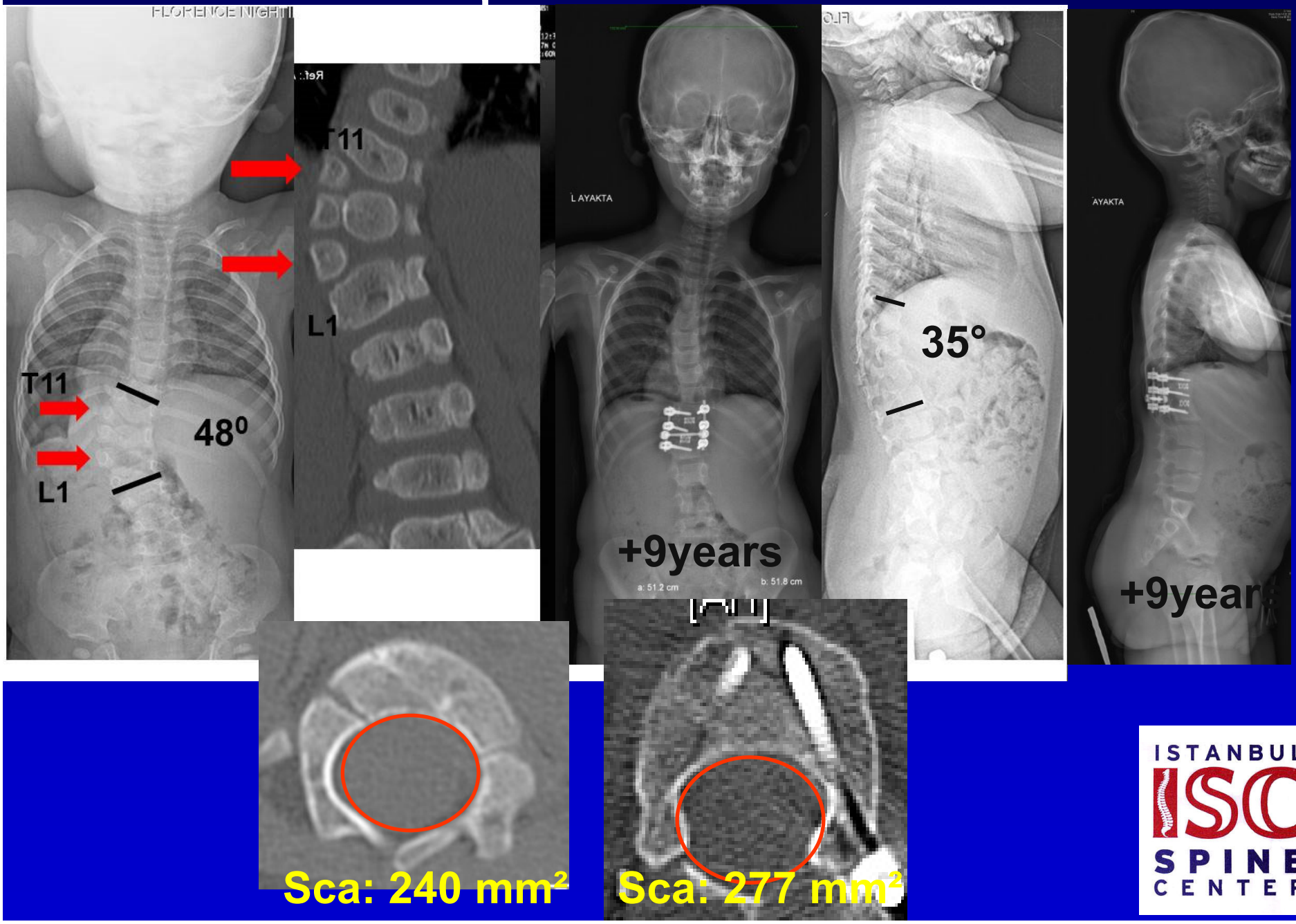
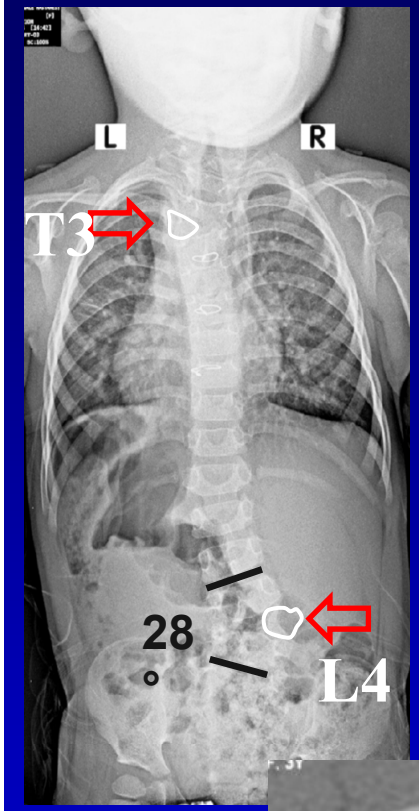
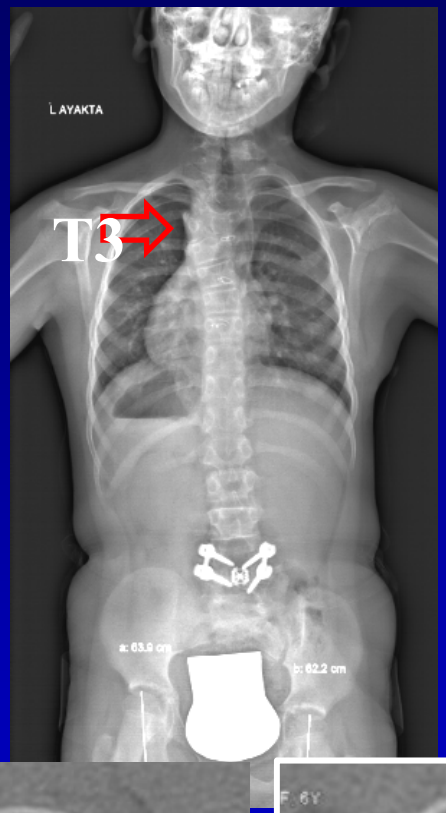
YD, 1.5y, M, 2 level hemivertebra excision via posterior only



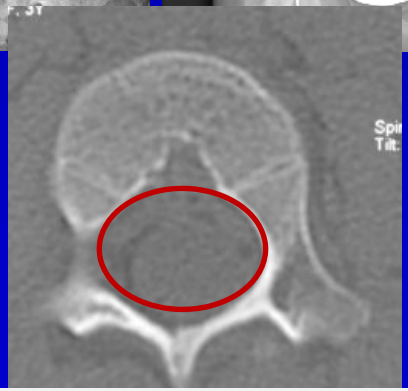
NC, 3y, F. T3 hemivertebra and L4 hemivertebra.
L4 hemivertebrectomy + observation for T3 hemiverterbra ,



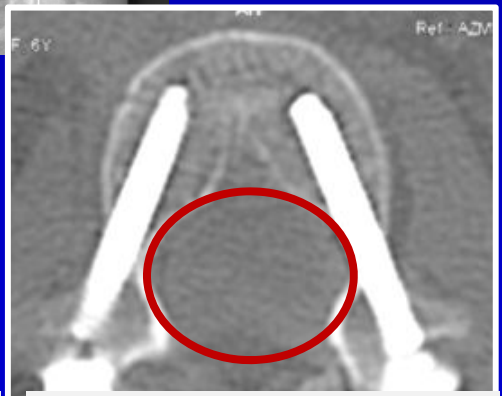


+8years f/up

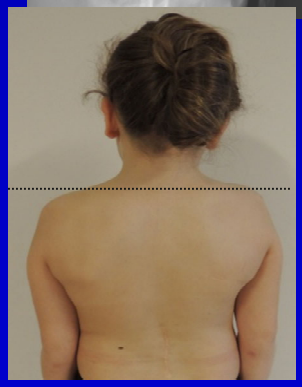
+8years



Sca: 238 mm²



Sca: 291 mm²



CONCLUSION

The results of this CT study demonstrated that surgical treatment of congenital scoliosis/ kyphoscoliosis due to hemivertebra with pedicle screw fixation in children younger than 5 years old ;

- ✓ Provides and maintaines satisfactory correction on both planes
- ✓ Does not cause iatrogenic spinal stenosis and no retardation on vertebral body growth.

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THANK YOU

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