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Effect of Direct Vertebral Rotation in Single Thoracic Adolescent Idiopathic Scoliosis: Better Deformity Correction, More rotational Correction with Limited Fusion Segments

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All authors have no financial relationships to disclose

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Direct Vertebral Rotation in AIS

- **True 3-D deformity correction**
- **Vertebral body rotation**
- **Improved correction of both fused & unfused curve**
- **Short fusion level**
  - **Preservation of motion segments**

Purpose

To analyze in the effect of DVR on radiologic outcomes using segmental pedicle screw instrumentation (PSI) in the treatment of single thoracic AIS

Inclusion Criteria

- **AIS with single thoracic curves**
- **Bilateral PSI with RD and/or DVR**
- **Selective thoracic fusion (STF)**
- **Age at the time of surgery < 18 years**
- **A minimum 2-year F/U**

Materials & Methods

- **Retrospective comparative, multi-center study**
  - **2007 ~ 2014**
- **Number of patients : 110**
  - **non DVR group: 63 & DVR group: 47**
- **Age at the time of surgery : 15.0 Y (10~17)**
- **Follow-up duration : 4.8 Y (2.1~9.8)**
- **Fused segments: non DVR vs DVR = 11.7 vs 8.9**

Result: Main Thoracic Curve

	Total (N=110)	Non-DVR Group (N=63/110)	DVR Group (N=47/110)	*P* value
Preop	59.2 ± 16.6	63.9 ± 17.1	52.9 ± 13.5	< 0.000
IMPO	18.3 ± 9.5* (69.1%)	20.9 ± 8.1* (67.3%)	14.8 ± 10.1* (72.0%)	0.001
Last F/U	18.6 ± 9.7 (68.6%)	20.8 ± 9.0 (67.4%)	15.7 ± 9.7 (70.3%)	0.006

**: significantly changed from the value of previous time-point*

- **Significantly improved at IMPO and maintained at last F/U**
- **Significant difference at IMPO and last F/U between two groups**
- **MT curve maintained at last F/U in both groups**

Result: Proximal Thoracic Curve

	Total (N=110)	Non-DVR Group (N=63/110)	DVR Group (N=47/110)	*P* value
Preop	31.7 ± 11.8	33.3 ± 11.4	29.5 ± 12.0	0.092
IMPO	15.5 ± 7.3* (51.1%)	16.3 ± 7.8* (51.1%)	14.5 ± 6.4* (50.8%)	0.186
Last F/U	15.6 ± 8.0 (50.8%)	16.3 ± 8.6 (51.1%)	14.5 ± 6.9 (50.8%)	0.250

**: significantly changed from the value of previous time-point*

- **Significantly improved at IMPO and maintained at last F/U**
- **No significant difference at IMPO and last F/U between two groups**

Result: Lumbar Curve

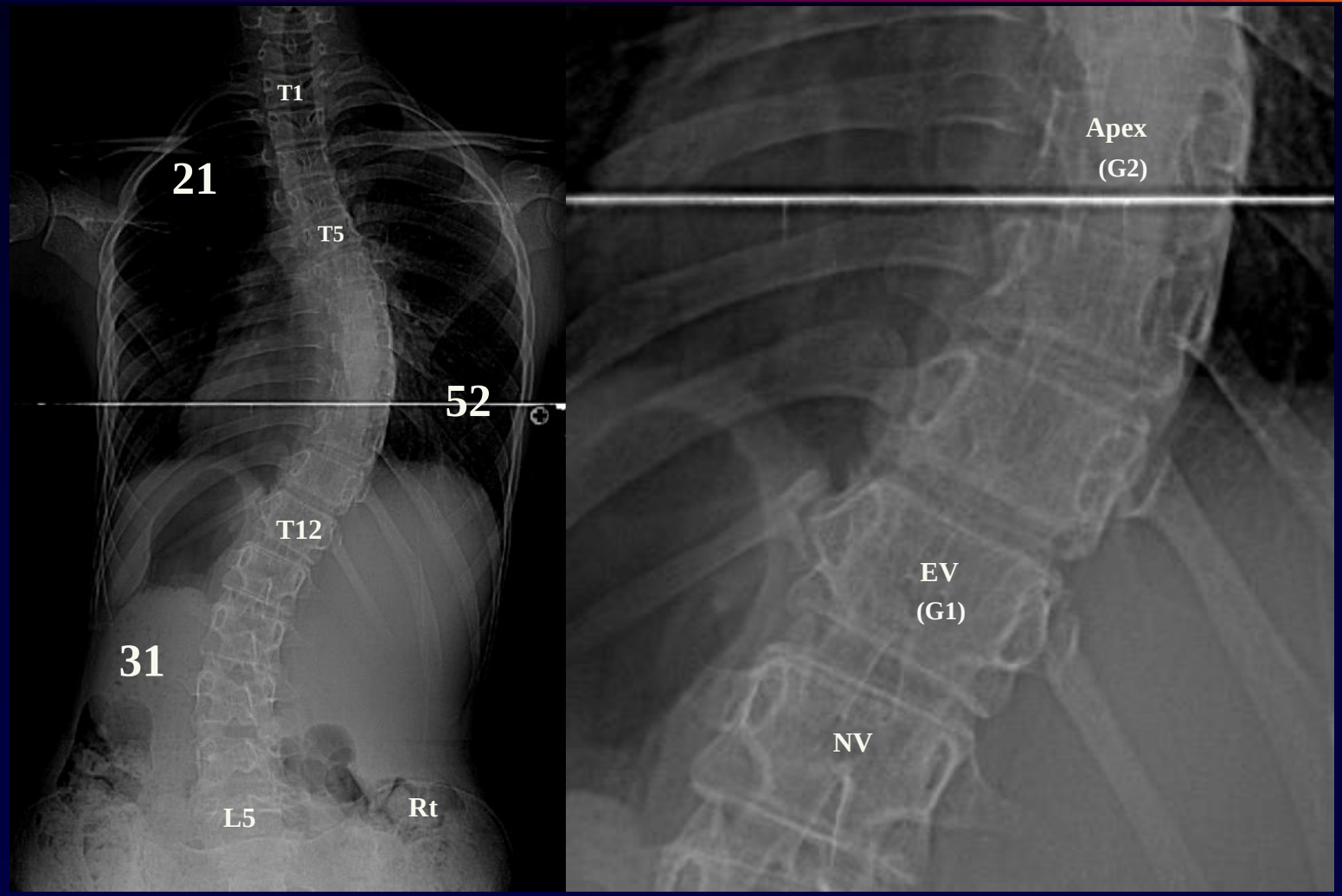
	Total (N=110)	Non-DVR Group (N=63/110)	DVR Group (N=47/110)	*P* value
Preop	30.3 ± 9.8	31.3 ± 10.1	28.8 ± 9.1	0.188
IMPO	10.5 ± 6.0* (65.3%)	11.2 ± 5.2* (64.2%)	9.5 ± 6.7* (67.0%)	0.155
Last F/U	10.3 ± 5.8 (66.0%)	11.2 ± 4.9 (64.2%)	9.1 ± 6.7 (68.4%)	0.060

**: significantly changed from the value of previous time-point*

- **Significantly improved at IMPO and maintained at last F/U**
- **No significant difference at IMPO and last F/U between two groups**

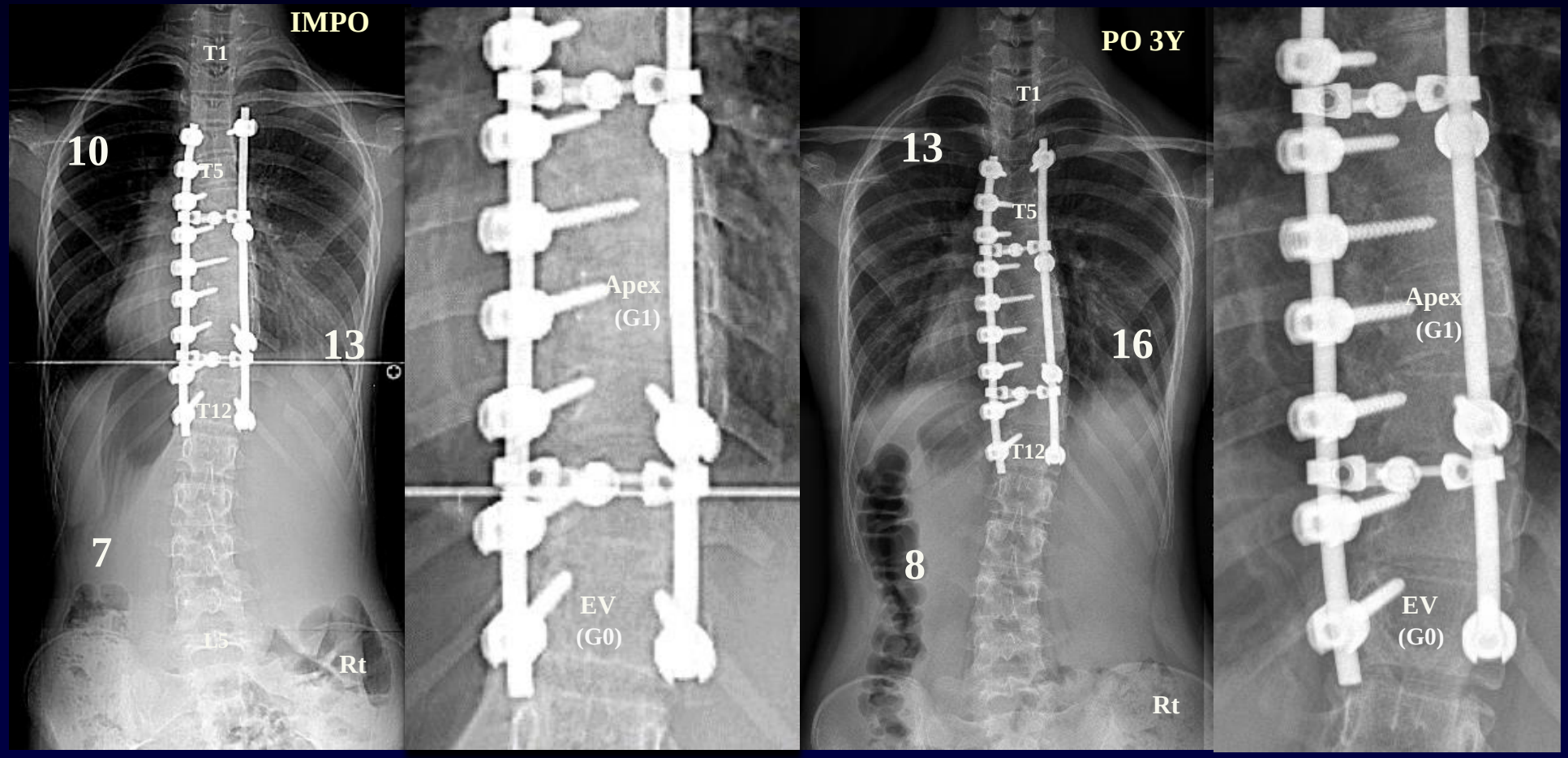
Case 1

F/14 AIS DT(A)



Case 1

Deformitiy correction & PF T4-T12



Conclusions

- **DVR could effectively achieved better deformity correction and more rotational correction with reduced number of fusion segments**

- **However, it is important that DVR should be applied in proper direction with adequate force**