Anterior or posterior release for severe rigid neuromuscular scoliosis: which is safer and more effective?

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Objective

Patients could acquired more benefit from which surgery approach: anterior release or posterior release?

To compare corrective efficiency between combined anterior/posterior approach and staged posterior approach .

To determine whether surgical treatment of severe and rigid scoliosis through a two-staged posterior approach is feasible, safe and effective.

Methods

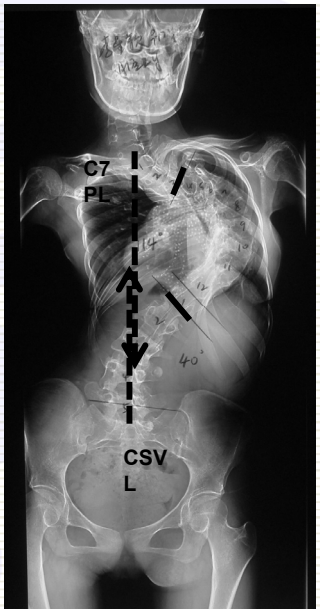
Inclusion criteria

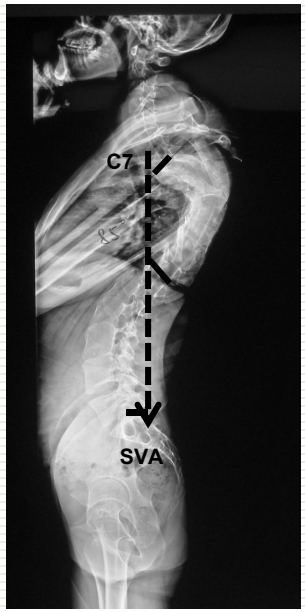
- Neuromuscular scoliosis
- Major curve > 100 °
- Flexibility < 30%
- All patients underwent staged surgery
- Complete radiographic and clinical materials

Group A-P: anterior release
Group P-P: posterior release

Radiological assessment

- Cobb angle of main curve
- Flexibility
- Global kyphosis
- Coronal balance
- Sagittal balance

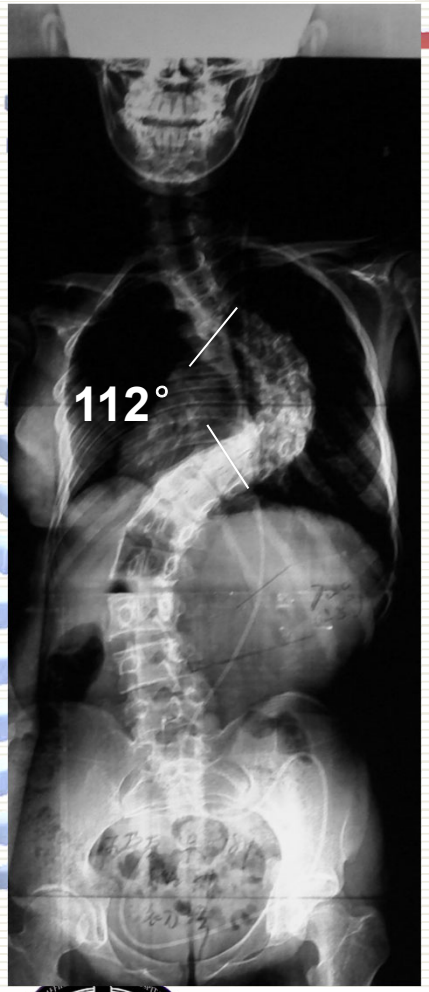


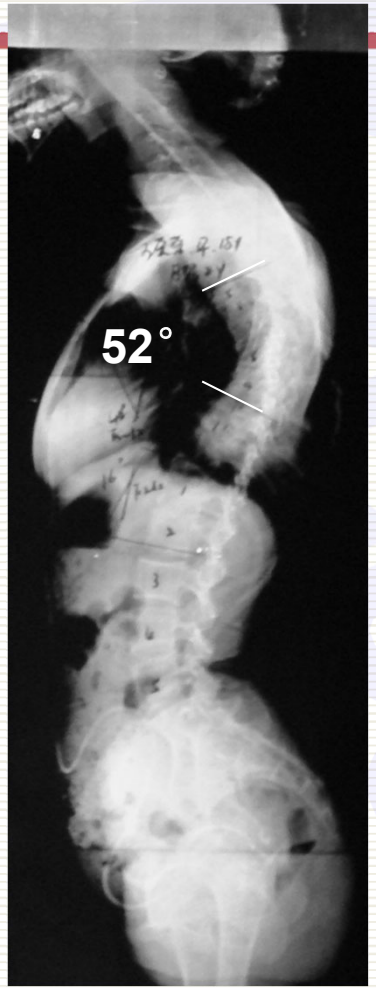


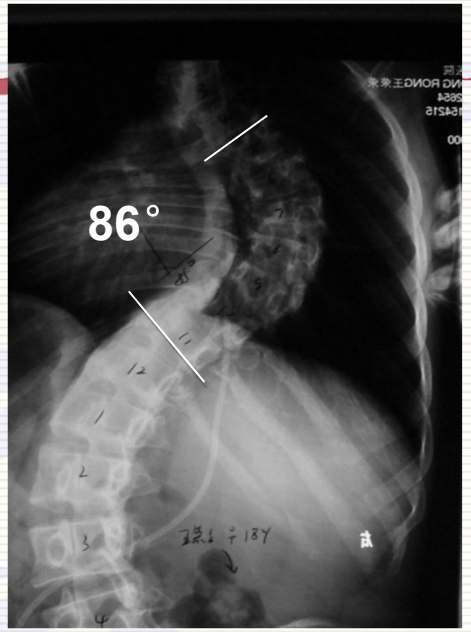
All of the parameters were measured pre-op, after halo-femoral traction, immediately post-op, and at the last follow-up

Improvement of flexibility after release and traction, correction after final surgery and complications were compared between two groups

#5695, F, 17 yrs , neuromuscular scoliosis, anterior release

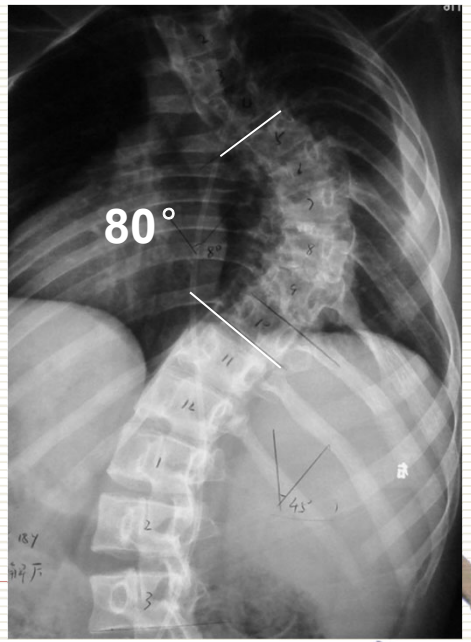




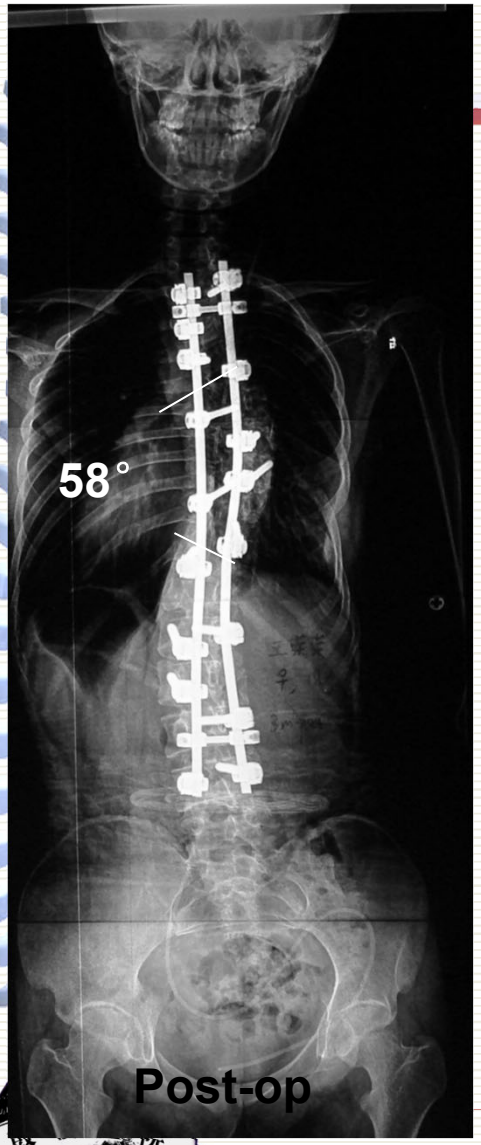


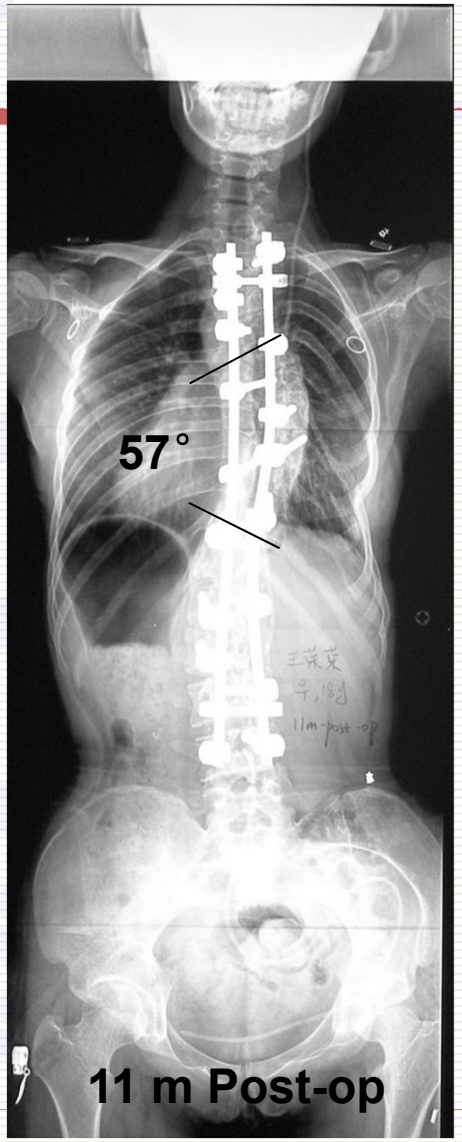
Bending film flexibility 23.2%

21 days post-traction flexibility 28.6%

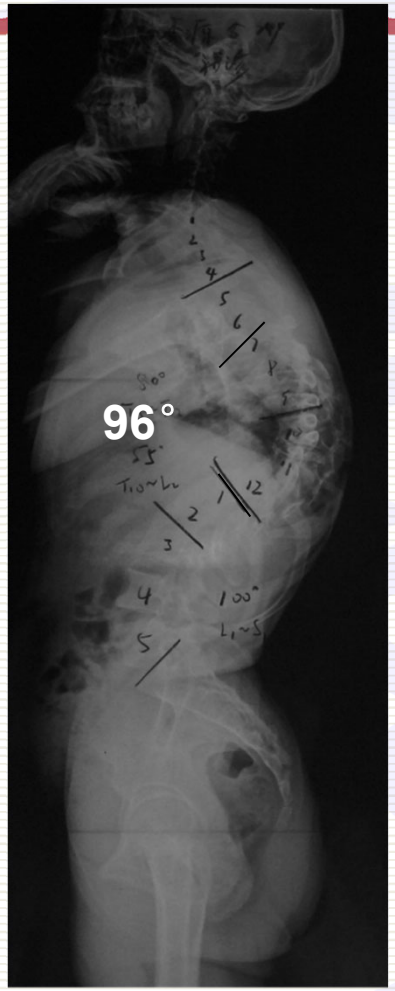


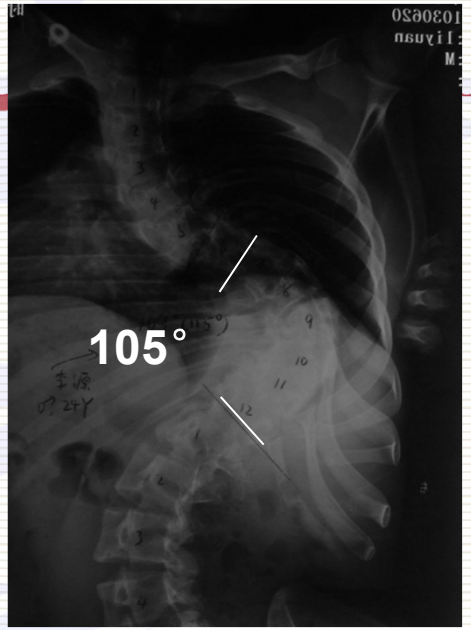
Correction rate 48.2%





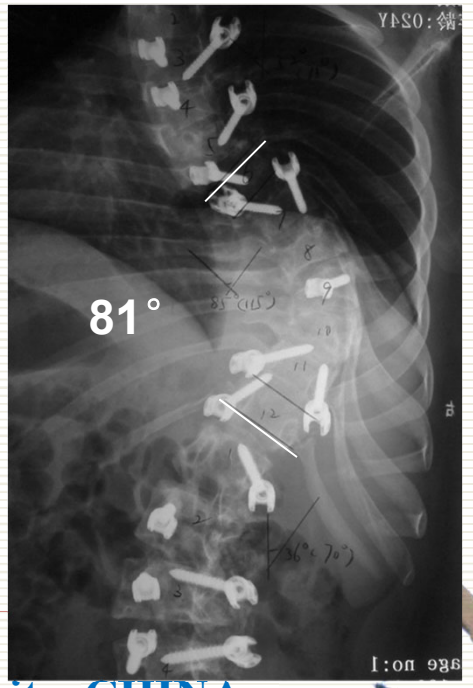
#8311, M, 24 yrs , neuromuscular scoliosis, posterior release



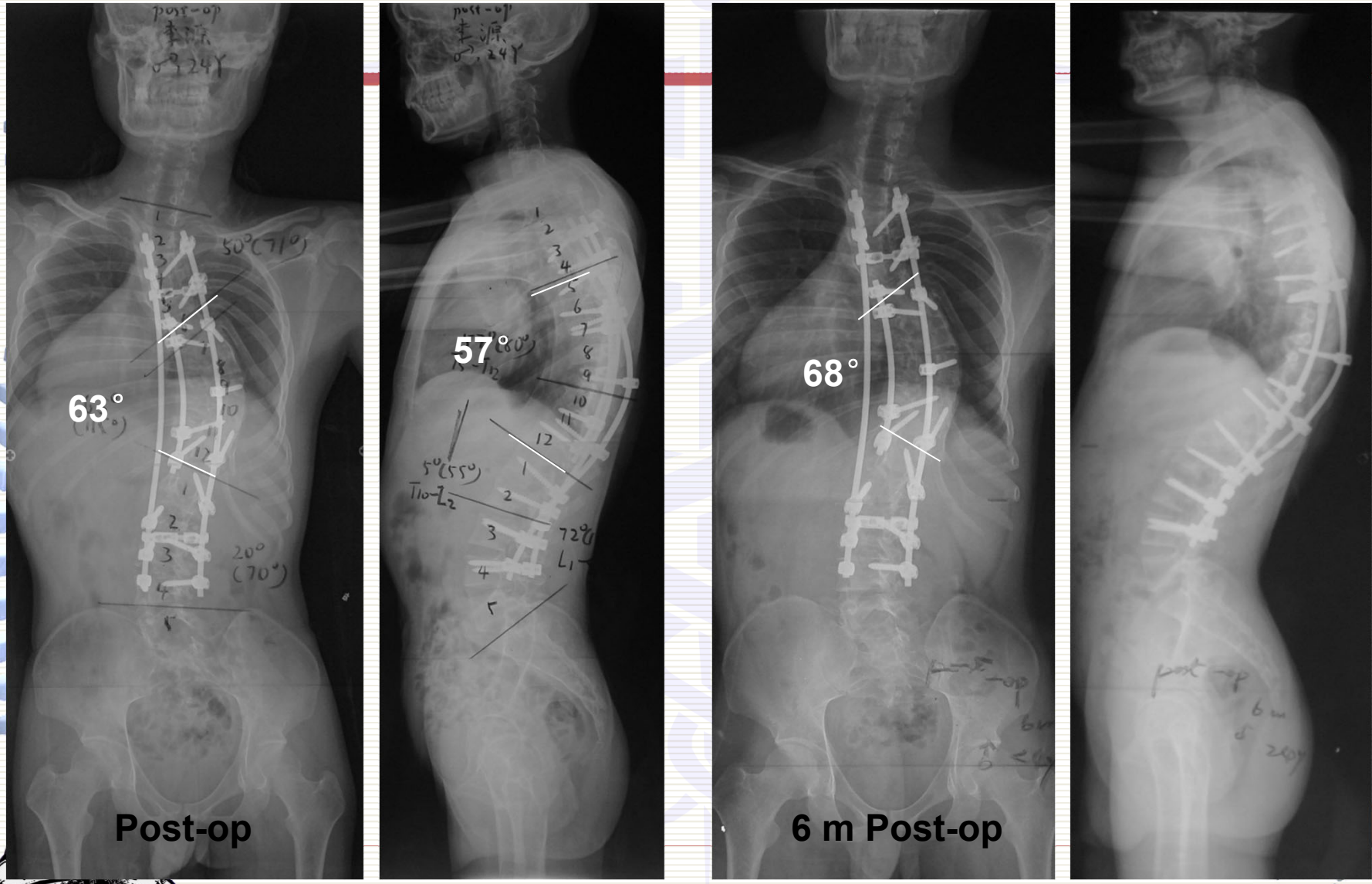


Bending film Flexibility 10.3%

21 days post-traction flexibility 30.8%



Correction rate 46.2%



Primary results

Parameters pre-op	A-P group (n=15)	P-P group (n=10)	*P* value
Age (y)	16.0±3.6	20.3±3.9	*P*=0.01
Gender	M: 7	M:5	*P*>0.999
	F: 8	F: 5	
Curve type	D: 6	D: 0	*P*=0.051
	S: 9	S: 10	
Cobb angle	113.5° ±11.7°	115.5° ±8.9°	*P*=0.646
Kyphosis	72.5° ±14.6°	95.4° ±20.4°	*P*=0.003
Bending	88.8° ±13.3°	99.0° ±9.4°	*P*=0.047
Flexibility	21.9%±7.4%	14.2%±6.2%	*P*=0.013
SVA (mm)	18.2±17.4	23.9±18.1	*P*=0.433
C7PL-CSVL (mm)	19.1±15.4	13.6±13.3	*P*=0.365

D: double curve; S: single curve

Comparison of radiographic parameters after surgery between anterior and posterior release

Parameters post-op	A-P group (n=19)	P-P group (n=19)	*P* value
Cobb angle Post-traction	77.0° ±14.6°	74.6° ±10.7°	*P*=0.652
Flexibility post-traction	32.2%±9.8%	35.3%±8.9%	*P*=0.436
Benefit from release and traction	10.4%±8.5%	21.1%±9.3%	*P*=0.007
Coronal cobb angle	58.8° ±21.4°	61.4° ±7.1°	*P*=0.726
Correction rate of coronal	48.9%±15.9%	46.7%±6.6%	*P*=0.694
kyphosis	39.1° ±7.2°	48.1° ±8.2°	*P*=0.008
Correction rate of kyphosis	44.5%±13.4%	48.9%±6.3%	*P*=0.341
SVA (mm)	19.3±10.4	23.4±15.4	*P*=0.428
C7PL-CSVL (mm)	20.8±9.8	17.3±15.3	*P*=0.487

Conclusions

Staged posterior surgery was a safe, efficacious method for severe rigid scoliosis.

Patients could obtained more benefit from posterior release combined halo-femoral traction.

Rigid curve and severe kyphosis might responsible for the lower correction rate of coronal cobb angle.

Thank you!

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