

The shoulder balance rebuilding in severe thoracic scoliosis with a lower shoulder on the concave side: experience from a single institution involving 84 PVCR patients over 13 years



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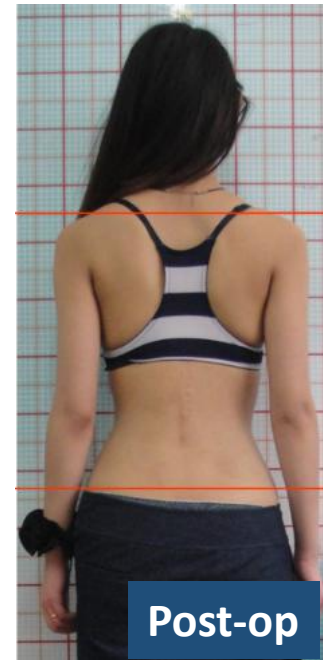


Background

- The shoulder imbalance is a common phenomenon in spinal deformities, especially in severe rigid scoliosis patients.
- *It is a important question for every one of patients, not just for surgery!*

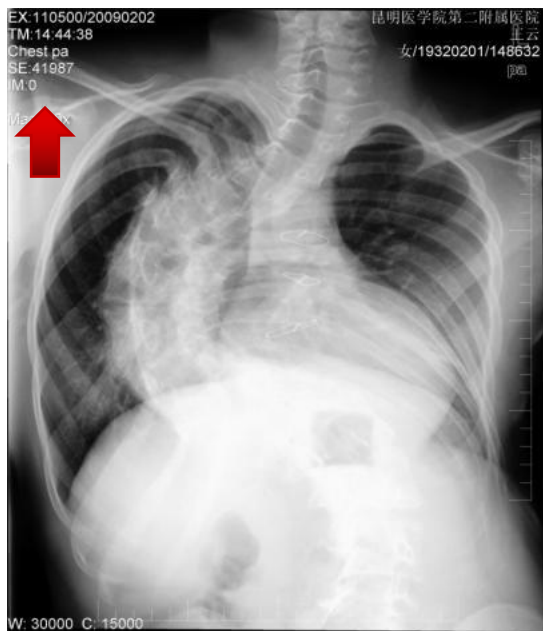


An beautiful shoulder is every girl's dream !



Background

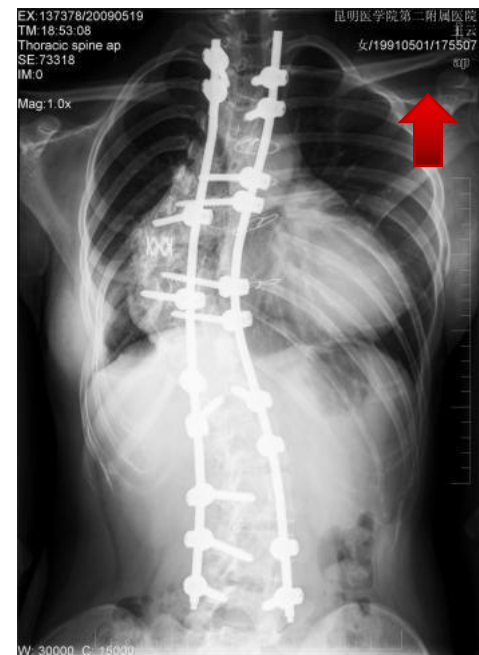
- Should imbalance was more common and more serious in severe scoliosis patients than it in AIS.
 - *The special correction mechanism*
 - *A well deformity correction and well trunk balance*
- could lead to ***a new shoulder imbalance*** in PVCR.



PVCR
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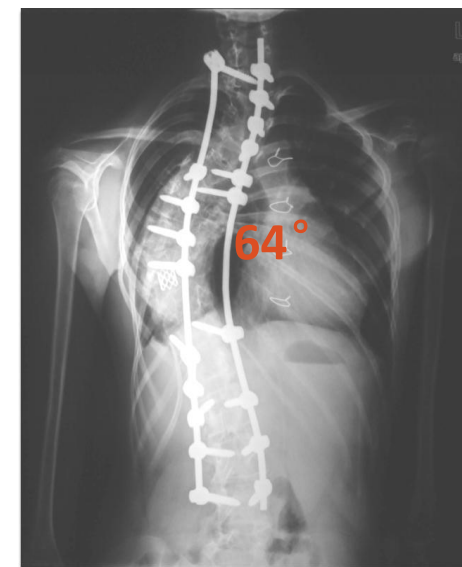


Objective

- *There was no study and guideline about how to rebuilding the should balance of the severe scoliosis patients in PVCR.*

Objective

To analyze the clinic and imaging data of the severe scoliosis patients received PVCR, then investigate the strategy of shoulder balance rebuilding in severe thoracic scoliosis received PVCR.

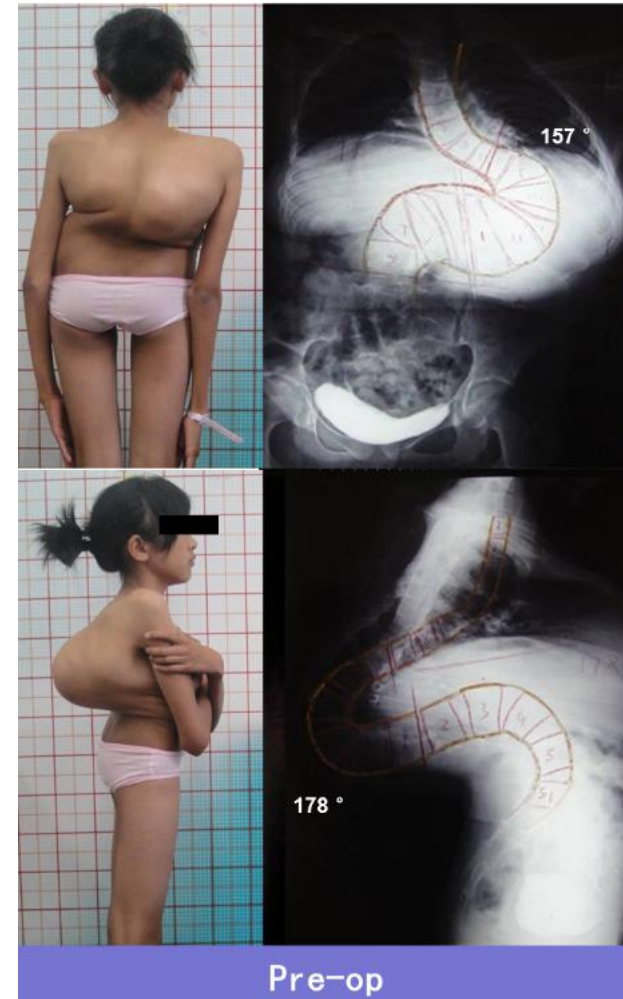


Methods

84 severe thoracic scoliosis treated with PVCR were retrospectively reviewed.

Excluded:

- *Patients with pelvic obliquity > 2 cm*
 - *leg length discrepancy,*
 - *muscle weakness of the lower limbs*
 - *a higher shoulder on the concave side*
- All patients performed routine posteroanterior standing radiographs before and after surgery.
 - The clinic data, shoulder height (SH), the Cobb angle and trunk shift were measured.



Methods

All patients followed the below steps to rebuild shoulder balance in PVCR:

1. Reconstruct trunk shift <2cm;

2. The correction of the major curve was the main force to rebuild the shoulder balance and would be result in elevating the shoulder on the concave side

--50% correction rate: 2.5cm

--60% correction rate: 3cm

--70% correction rate: 4cm)

It should be matched with the shoulder imbalance before surgery!



Methods

- All patients followed the below steps to rebuild shoulder balance in PVCR:

3. The correction of proximal fixation segment can further adjust the shoulder balance, but its efficiency is low (<1cm).

4. Sacrificed part of the trunk balance to reconstruct the shoulder balance was the last resort.

*5. Patients fixed to **T3** have a lower potential for remodeling the shoulder balance and the potential would be loss when fixed to **T2**.*



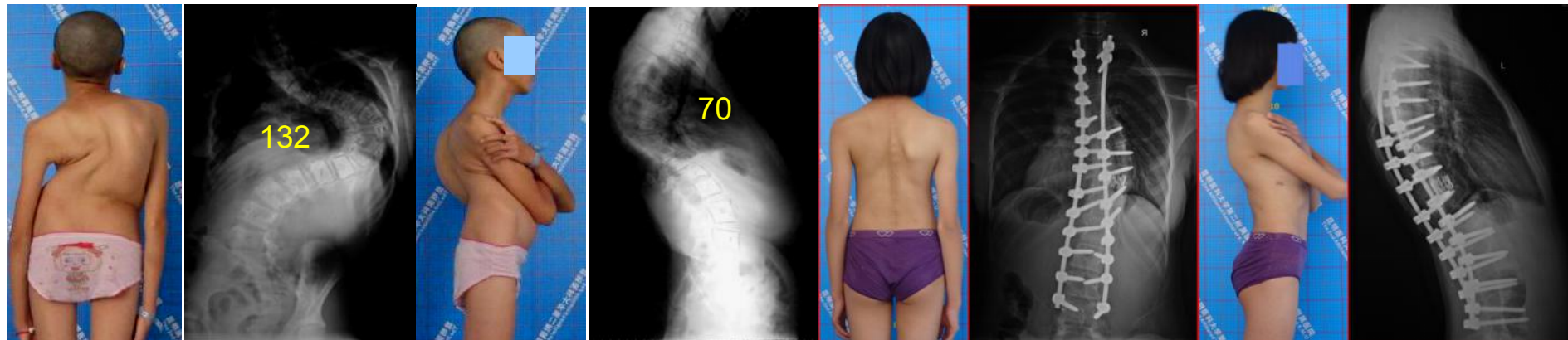
Results

- The study included 84 severe thoracic scoliosis patients, aged 12-25 years old.
- The mean preoperative major curve of $118\pm 17^\circ$ was corrected to $43\pm 13^\circ$ (correction rat: $65\pm 11\%$).
- The trunk shift was $2.47\pm 0.56\text{cm}$ before surgery and $1.56\pm 0.36\text{cm}$ after surgery.



Results

- *The average preoperative SH was 26.7 ± 6.9 mm, the average postoperative SH was 11.3 ± 4.1 mm (mean change: 31.6mm)($P < 0.05$).*
- *69(82%) patients showed shoulder imbalance before surgery and 19(23%) showed shoulder imbalance after surgery ($p < 0.05$).*



Conclusions

- Preoperative shoulder imbalance in patients with severe scoliosis is more common and more severe.
- PVCR has a special impact on the reconstruction of the patient's shoulder balance, *often resulting in new shoulder imbalances.*
- **The strategy in the study can guide to better reconstruct the shoulder balance during PVCR.**
 - *Trunk shift <2cm, but sometimes should sacrifice part of the trunk balance*
 - *The **correction rate of the major curve** should be matched with the shoulder imbalance before surgery.*
 - *The **correction rate of proximal fixation** segment*
 - *Fixation **below T3** is benefit to remodeling the shoulder balanc after surgery*



Disclosures

Authors:

Tao Li	No Relationship
Yingsong Wang	No Relationship
Jingming Xie	No Relationship
Ying Zhang	No Relationship
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Ni Bi	No Relationship

