

HEMIVERTEBRA EXCISION VIA ONLY POSTERIOR APPROACH IN CHILDREN WITH HEMIVERTEBRA CONGENITAL SCOLIOSIS

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CONGENITAL SCOLIOSIS

- Spinal Deformity with the Presence of Vertebral-Anomalies
- 5% in scoliosis
- Prediction about what will happen with growth is very difficult

Challenges for surgeons

- Early onset and spine still grows strongly
- Physical therapy and orthoses- inefficace
- Making decision early

SURGICAL TREATMENT OPTIONS

Prevent Future Deformity

In Situ Fusion

Correct Present Deformity

Gradual Correction

- *Hemiepiphyodesis*
- *Growing Nonfusion Rod*

Acute Correction

- *Instrumentation & Fusion*
- *Hemivertebra Excision*
- *Osteotomy*

Hemivertebra Excision

- Popular procedure

- Immediate
 - Excellent
- } Correction

Bradford, JBJS Am, 1990

- Remove the etiology
- Prevent worsening

Combined A+P

- ✓ Vascular complications
- ✓ Visceral complications
- ✓ Less correction in coronal plane

Combined A + P

- Anterior Approach
- Posterior Approach

Leatherman, JBJS Am, 1996

Single Approach

- Posterior Excision
- Eggshell procedure

Posterior only

- ✓ Implant (pedicle screw) related complications
- ✓ More correction in coronal plane

2003, Ruf M et al.; 2001-2008 Jalanko T, Rintala R et al.;
Zhonghua Yi, Xue Za Zhi et al.; Mladenov K, Kunkel P, Stuecker
R.; Peng X, Chen L, Zou X., Wang SR, Zhang JG, Qiu GX et al.
2003 - 2007, Wang Y, Lu N, et al...

PURPOSE

To evaluate the radiological and clinical outcomes of patients having posterior resection of hemivertebra and pedicle screw to correct and stabilize the deformity

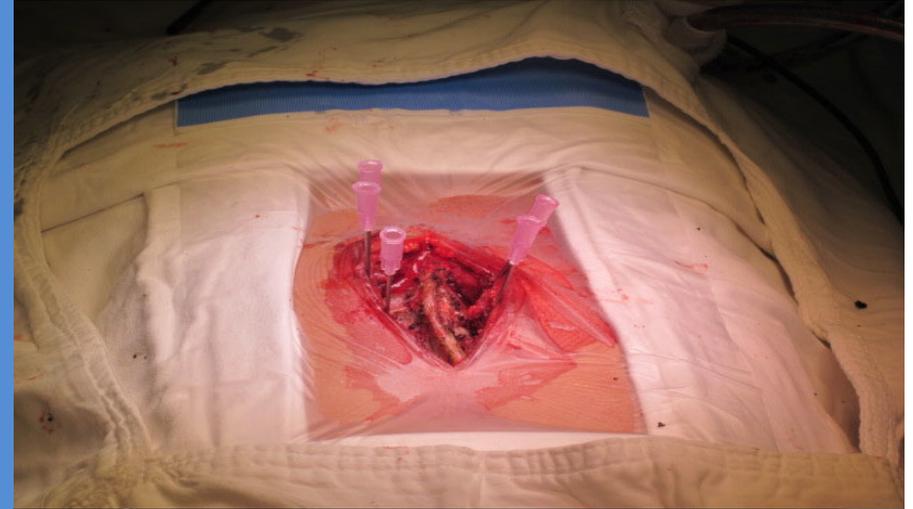
PATIENTS AND METHOD

- ◆ Retrospective and prospective study
- ◆ Choose the pts
 - Hemivertebra scoliosis 3-10 yrs
 - Cobb angle $\geq 40^{\circ}$
- ◆ 6/2009 – 6/2013 25 hemivertebra excision and transpedicular fixation via only posterior approach in children with hemivertebra congenital scoliosis were reviewed

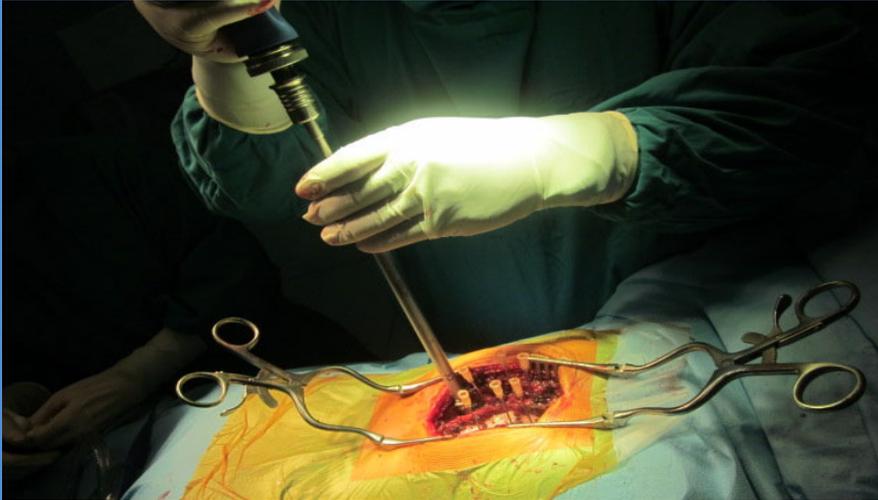
HEMIVERTEBRA EXCISION



- Prone position.
- Incision at local deformity
- Confirm hemivertebra under Carm.

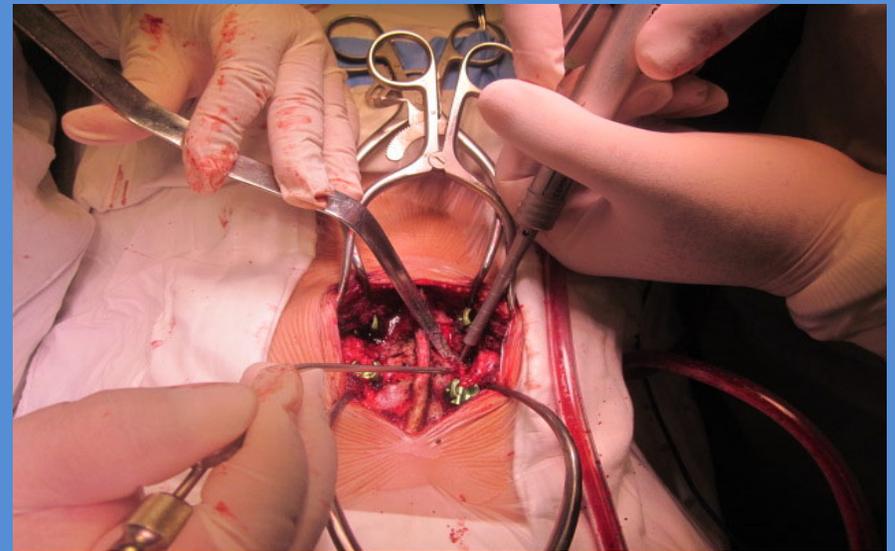


HEMIVERTEBRA EXCISION

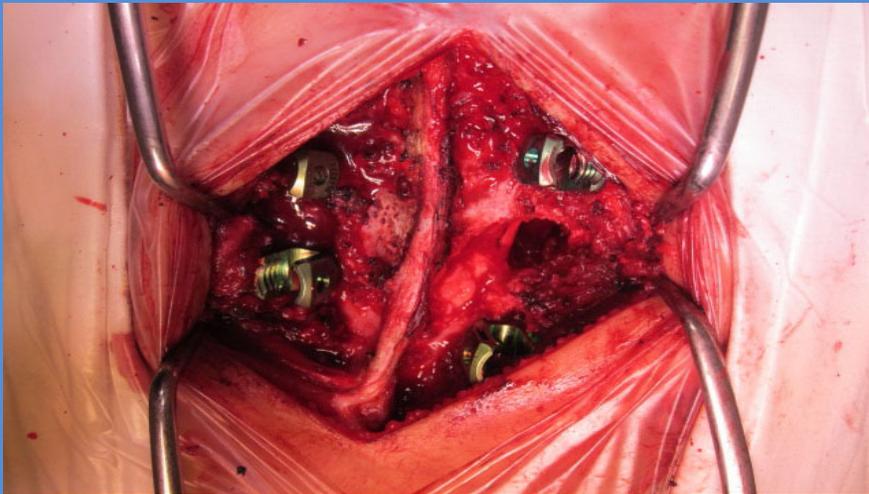


- Putting pedicle screws for 2 vertebrae who advance hemivertebra
- Laminectomy of hemivertebra

- Hemivertebra excision and 2 disc through pedicle of hemivertebra by drill and curette

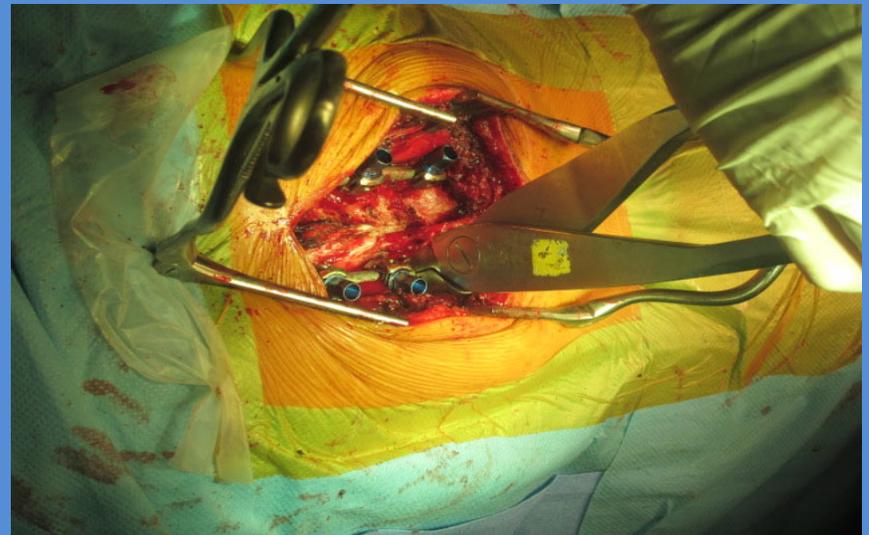


HEMIVERTEBRA EXCISION



- ❖ Excision of articularis and transverse process hemivertebra
- ❖ Anterior gap is filled with bone chip

- ❖ Short segment instrumentation and compression on the convex side
- ❖ Wake up test or monitoring spinal cord during reducing
- ❖ Posterior fusion
- ❖ Postoperative orthosis is done for 6 months.



RESULTS

- ❖ Operative time: Mean operative time 168 min (80-270 min)
- ❖ The total blood loss: Mean blood loss 209 ml (50 - 400 ml)
- ❖ Blood Transfusion : 11 cases (44%) Blood Transfusion 125 ml
- ❖ Follow up: Mean 24 months (6 -57 months)
- ❖ Cobb angle scoliosis pre op: Mean 44.89° (40°- 67°).
- ❖ Cobb angle scoliosis post op: Mean 12,21° (0° - 30°).
- ❖ Reduce : 72.80% (33.33% - 100%).
- ❖ Cobb angle scoliosis at last exam: 13.40° (1° - 30°).
- ❖ Cobb kyphosis preop: 15.78° (0° - 50°).
- ❖ Cobb kyphosis postop: 6.11° .
- ❖ Reduce: 54.7%.
- ❖ 1 pedicle screw – backward (refuse to wear brace PO)
- ❖ 1 pneumonia
- ❖ None of neurological problems or infections associated with surgery.
- ❖ Not detected pseudoarthrosis or implant failure.

DISCUSSION

- In our series, 25 hemivertebra excision and monosegmental fusion of local deformity was achieved through pedicle by single posterior approach.
 - Early fusion in progressive curves
 - The single posterior hemivertebra resection are significantly lower complication rate and shorter postoperative recovery period
- After hemivertebra excision and monosegmental fusion with pedicle screws by posterior approach showed:
 - Reduce Cobb scoliosis 72.80% and kyphosis 54.7% Good curve correction in the coronal and sagittal plane
 - Cobb angle scoliosis and kyphosis PO and latest exam- No significant difference – stable and solid fusion
 - All patients in our study showed solid fusion at the latest follow-up, thus only minimal curve change can be expected with longer follow-up.

16 months PO

Nguyen Ly Quoc K, 8yrs, male FU 16 months

Op. Time 120 mins, blood loss 150 cc

Cobb scoliosis: preop 40° post op 5°

Last F.U. 5°

Cobb kyphosis: preop 5° post op 0°

Last F.U. 0°

Yielding : 87.5%

Pre op



CONCLUSION

- ◆ Hemivertebra resection via posterior approach and mono segment transpedicular instrumentation is safe and effective in young children.
- ◆ Good curve correction in the coronal and in the sagittal plane can be achieved with hemivertebra resection through an SPA
- ◆ Blood transfusion is little
- ◆ Benefits of the single posterior hemivertebra resection are significantly lower complication rate and shorter postoperative recovery period.



Thank You