CLINICAL AND RADIOLOGIC OUTCOMES OF POSTERIOR ONLY HEMIVERTEBRA RESECTION AND SHORT SEGMENT FUSION WITH PEDICLE SCREW FIXATION IN CHILDREN YOUNGER THAN 5 YEARS: MINIMUM 10 YEARS FOLLOW-UP

Yunus Emre AKMAN, MD
İşık KARALOK, MD
Emel KAYA, MD
Cem SEVER, MD
Yesim EROL, BSc
Tunay SANLI, MA
Sinan KAHRAMAN, MD
Meric ENERCAN, MD
Azmi HAMZAOGLU, MD

Istanbul Spine Center
Florence Nightingale Hospital
Istanbul-TURKEY
<table>
<thead>
<tr>
<th>Author</th>
<th>Relationships Disclosed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yunus Emre AKMAN</td>
<td>No Relationship</td>
</tr>
<tr>
<td>Isik KARALOK</td>
<td>No Relationship</td>
</tr>
<tr>
<td>Emel KAYA</td>
<td>No Relationship</td>
</tr>
<tr>
<td>Cem SEVER</td>
<td>No Relationship</td>
</tr>
<tr>
<td>Yesim EROL</td>
<td>No Relationship</td>
</tr>
<tr>
<td>Tunay SANLI</td>
<td>No Relationship</td>
</tr>
<tr>
<td>Sinan KAHRAMAN</td>
<td>No Relationship</td>
</tr>
<tr>
<td>Meric ENERCAN</td>
<td>No Relationship</td>
</tr>
<tr>
<td>Azmi HAMZAOGLU</td>
<td>Medtronic(b)</td>
</tr>
</tbody>
</table>

Relationships Disclosed:

(a) Grants/Research Support  
(b) Consultant  
(c) Stock/Shareholder  
(d) Speakers’ Bureau  
(e) Other Financial Support
Previous studies evaluated midterm outcomes of posterior hemivertebra resection and short-segment fusion technique in patients under age 5 years, however there are few studies with long term outcomes.
INTRODUCTION

This study evaluates long term outcomes of 13 patients under 5 years with congenital scoliosis due to hemivertebra who underwent posterior hemivertebra resection and short-segment fusion, with minimum 10 years of follow-up.
MATERIAL & METHODS

- 13 (8F/5M) patients under age of 5 years during surgery and had minimum 10 years follow-up were included.

- Mean age was 3.5 (1-5) years at the time of surgery.

- All patients underwent posterior hemivertebrectomy and short-segment fusion with pedicle screw fixation.
MATERIAL & METHODS

- Main and compensatory curves and sagittal parameters were measured on pre-op, post-op, follow-up x-rays.

- Follow-up x-rays were reviewed for occurrence of new curve development.

- SRS22 score was evaluated at latest follow-up

- Mean follow-up period was 11.5 (10-17) years.
RESULTS

- 8 patients had pure scoliosis and 5 patients had kyphoscoliosis.

- Total 17 hemivertabrae (HV) were resected.

- Mean main curve of 32.2° was corrected to mean 3.8° at early post-op and mean 9.6° at final follow-up (70.2%).

- Mean compensatory curve of 13.8° was corrected to mean 2.1° at early post-op and mean 6.2° at final follow-up.

**Location of Hemivertebra**

- Thoracic: 10 HV
- Th/L: 2 HV
- Lumbar: 5 HV
RESULTS

- Mean local kyphosis improved from $31.2^\circ$ to mean $5.3^\circ$ at final follow-up (83.1%).

- Sagittal alignment was restored and maintained (Mean SVA: +21mm at final follow-up).

- Mean SRS22 score was 4.5 at follow-up.

- There was no pseudoarthrosis.
RESULTS

- A new C-shaped, long, flexible curve with the apex at the level of the resected hemivertebra (4 lumbar, 1 thoraco-lumbar) developed in 5 patients (38%).

- Mean age at new curve diagnosis was 11.2 (6-14) years.

- Mean new C-shaped curve was 21° (16-30).

- No additional surgery was performed.

- Only 1 patient was treated with brace.
MS, 2y11m, F

Preop

3 month f/up

3 years f/up

7 years f/up

12 years f/up

14 years f/up
EC, 2y3m, M

Preop L2

37°

L2

3°

12°

7 years f/up

30°

10 years f/up

12°
Posterior hemivertebra resection and short-segment fusion technique under 5 years provided satisfactory correction on both planes.

However, a new C-shaped, long, flexible curve with its apex at the level of the resected hemivertebra was observed at long term follow-up in 38% of patients.
CONCLUSION

This study suggests that patients with congenital scoliosis who undergo posterior hemivertebra resection and short-segment fusion under 5 years should be followed up closely till the end of adolescence growth spurt.
THANK YOU