

Management of Neglected Severe Adolescent Scoliosis (>100°) : Two-Year Outcomes After Posterior Vertebral Column Resection

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Introduction

The optimal surgical strategy for neglected severe kyphoscoliosis remains controversial. Surgical correction of rigid curves exceeding 100° is technically demanding and associated with a high risk of complications. This study aimed to present the minimum two-year radiological and clinical outcomes of 21 patients with neglected adolescent scoliosis and rigid coronal curves >100° treated with posterior vertebral column resection (PVCR).

Materials and Methods

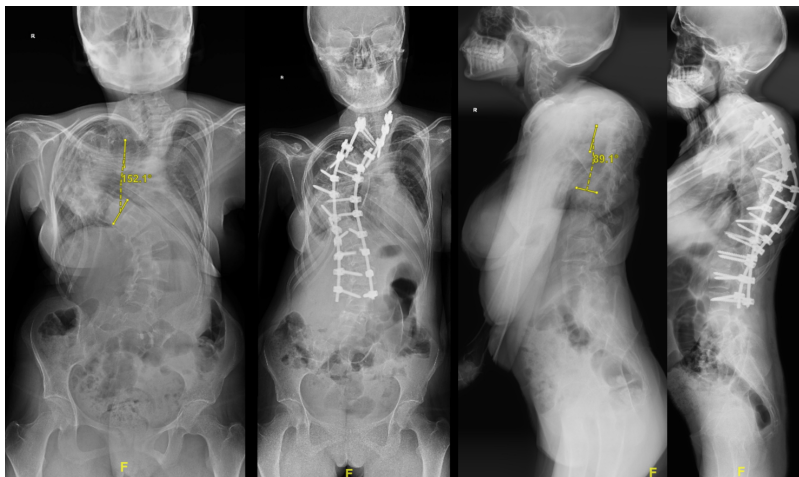
Twenty-one patients with neglected adolescent scoliosis and coronal curves $\geq 100^\circ$ were included. Preoperative evaluation consisted of standing full-spine radiographs and side-bending films. Curve flexibility was <30% in all cases. Three patients underwent preoperative halo-gravity traction for two months with close neurological monitoring, and three patients received intraoperative traction. All patients underwent Schwab type 5 or type 6 osteotomy. Intraoperative neuromonitoring and cell-saver were used in all cases. Pedicle screw placement was performed under O-arm navigation guidance in two patients. Radiological correction was assessed using standing scoliosis radiographs at postoperative year 1 and at final follow-up. Neurological examinations were performed pre- and postoperatively, and Lower Extremity Motor Scores (LEMS) were recorded. Patient satisfaction was evaluated using the SRS-22 questionnaire.

Results

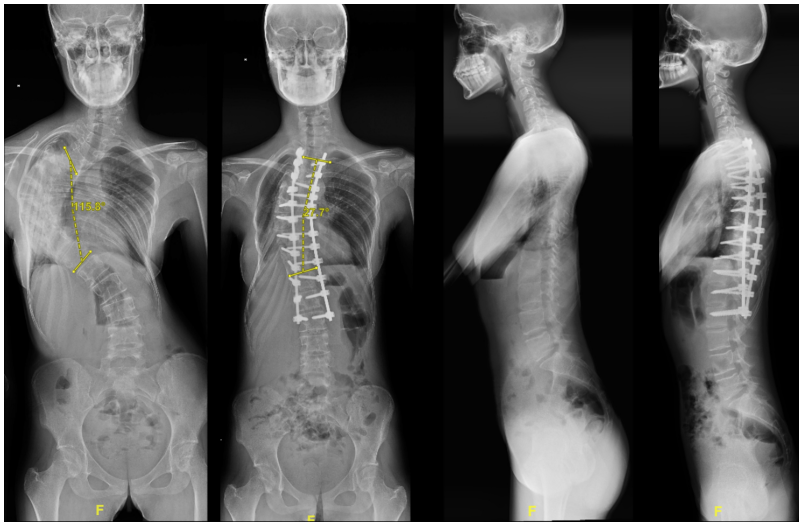
Of the 21 patients, 8 were male and 13 were female. The mean age was 23.1 years (range, 14–31), and the mean follow-up duration was 27 months (range, 12–36). The mean preoperative coronal Cobb angle was 120° (range, 104–145) and 125° (range, 110–140) depending on curve pattern. At postoperative year 1 and year 2, the mean coronal angle improved to 42° and 39°, respectively ($p < 0.001$). The mean correction rate was 64.8%. Among 12 patients with hyperkyphosis, mean thoracic kyphosis improved from 91° preoperatively to 43° postoperatively. Four patients experienced early postoperative decreases in LEMS; however, all had normal neurological examinations at the second postoperative year. The mean SRS-22 score improved from 2.1 preoperatively to 4.6 at two years.

Conclusion

PVCR is an effective technique for the correction of severe rigid spinal deformities exceeding 100°, providing substantial coronal and sagittal plane improvement. However, it is associated with a considerable risk of complications. Optimal anesthesia management and continuous neuromonitoring are essential. Preoperative and intraoperative halo traction may enhance correction rates. O-arm navigation can reduce implant-related errors in challenging cases. With modern technology and an experienced multidisciplinary team, complication rates in PVCR surgery can be significantly reduced.



Preoperative and postoperative full-spine AP and lateral radiographs of a 24-year-old female patient who underwent two months of halo-gravity traction followed by T8 PVCR



Preoperative and postoperative full-spine AP and lateral radiographs of a 19-year-old female patient who underwent T8 PVCR