

Management of eos by Proximal Fixation with 4rib Construct

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Introduction

Current methods (growing rod and VEPTR) for management of early onset scoliosis associated with kyphosis have not been satisfactory. We introduce a new method of proximal rib fixation that has performed very well.

Methods

Records and radiographs of Eighteen patients with early onset scoliosis were treated with the non-fusion 4-rib construct surgical technique, from August 2007 to April 2009 with follow up for about 28 months (range: 24-44 months). Diagnosis of early onset deformity included nine scoliosis, six kyphoscoliosis, and three kyphosis. Of these, eight were congenital, five were syndromic, and five neuromuscular. fourteen with rib pelvic, two with rib spinal, two with rib pelvic augmented with spinal fixation_using dual rod placement. Surgical technique consisted of bilateral 4.5 mm rods, distal fixation with iliac or spinal screws, and bilateral proximal fixation with two down-going superior laminar hooks and two up-going inferior laminar hooks on 4 adjacent superior ribs.

Results

Mean age at surgery was 6.8 years (from 2-12.9 years). Eight children had had prior spinal surgical management (3 fusion in situ, 3 treated for spinal dysraphism, 1 VEPTR , 1 unilateral rib pelvic construct).

Mean preop major scoliosis was 82, mean pre op thoracic kyphosis was 93 degrees, for 14 thoracolumbar was 62.

Mean post op scoliosis 52 degrees , mean post op thoracic kyphosis 62, thoracolumbar kyphosis 26 Overall, there were eleven complications in our series. These included:

- One case with distal implant dislodgment.
- One case with proximal implant dislodgment.
- One case with recurrent infection.
- Four cases experienced skin breakage .
- A case with Thoracolumbar kyphosis experienced mesenteric artery syndrome.
- Two patients had recurrence of the deformity (thoracic and thoracolumbar kyphosis One patient had crouch gait None of the patients experienced neurological complications, even though we operated on severe cases without intra operative neuro-monitoring system.

Conclusions

We believe that the 4 rib construct technique has advantages in the early onset scoliosis specially when associate with kyphosis due to:

1. Easy application.
2. Strong anchor proximally.
3. Avoid kyphogenic effect during rod lengthening.
4. Adjustment of the rod to control the apex.
5. Long lever arm without fusion.
6. No need for post operative brace with the dual rod.