

THE EARLY RESULTS OF ANTERIOR RELEASE AND INSTRUMENTATION IN THE TREATMENT OF IDIOPATHIC SCOLIOSIS PATIENTS*

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ABSTRACT :

Anterior release is generally indicated in the treatment of idiopathic scoliosis patients with rigid curves. One staged anterior instrumentation has started with Zielke, however, high rates of morbidity and pseudoarthrosis rates of this system has prevented its widespread use. In this study the results of 5 patients with one staged anterior instrumentation and 2 patients with anterior instrumentation followed by posterior instrumentation were evaluated. Mean follow-up was 18.1 months and mean age was 15.6 (11-22) years. One patient had Alici Spinal Instrumentation, one had Texas Scottish Rite Hospital System, one had Kaneda SR and remaining 4 patients had Cotrel-Dubousset-Hopf Instrumentation. Preoperative mean Cobb angle of major curves which was 85.3 (78-92) was brought to 40.7 (37-47) postoperatively and 52.3% of correction was obtained. A solid fusion was observed in all patients. One patient with implant failure was revised. In light of these findings it is suggested that although we are at the beginning of a learning curve, encouraging results can be obtained with anterior release and instrumentation in patients with rigid curves.

Key words: Anterior, Idiopathic scoliosis, spine.

INTRODUCTION

The excellent stability of multisegmental dorsal spinal instrumentation with the introduction of CDI makes posterior external immobilization unnecessary, (1, 2, 3, 4, 5). In the following years many more posterior instrumentations which include the basic principles of CDI concerning three dimensional correction of the spine has been developed.

Typical indications for choosing an anterior approach are primary tumors, solitary metastases, idiopathic, congenital and paralytic lumbar and thoracic scoliosis and other spinal deformities. Dwyer et al. developed the first anterior instrumentation in 1969 (14). This system was followed by the Zielke VDS method which offered wider and improved applicability (15, 16). Postoperative orthoses or posterior instrumentation are, however, unavoidable, and primary stability is impossible to achieve with VDS alone (17). Rod breakages and problems with the fixation of vertebra were observed by many authors and have also been described by Zielke (16). Love and Peters describe 36 cases of idiopathic scoliosis treated with a single anterior VDS instrumentation which showed an average decrease in thoracic kyphosis from 31 to 24 as well as an average decrease in lumbar lordosis of 8.3% (18).

In the last few years anterior systems such as TSRH, Kaneda and CDH have shown an improved stability compared with VDS.

PATIENTS and METHOD

Five patients with one staged anterior instrumentation and 2 patients with anterior instrumentation followed by posterior instrumentation were included in this study. Mean follow up was 18.1 months and mean age was 15.6 years (11-22).

Preoperatively, patients were evaluated in detail by clinical, radiological and laboratory examinations. Antero-posterior, lateral and bending radiograms of the patients were taken and Cobb angles, sagittal contour angles and their correction percentages were measured. One patient had Alici Spinal Instrumentation, one had Texas Scottish Rite Hospital System, one had Kaneda SR and remaining 4 patients had Cotrel-Dubousset-Hopf Instrumentation.

The patients were turned to their sides during the postoperative 1st day, were seated on the 2nd day. On the 3rd day they were encouraged to walk. No postoperative cast or brace were utilized. All the patients returned for a follow-up visit at the postoperative 1st, 3rd 6th, 12th and 18th months.

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RESULTS

The average blood loss among 5 patients with one staged anterior instrumentation was 1245cc. Operating time was 3.7 hours on average in these patients. In the remaining 2 patients with anterior instrumentation followed by a posterior instrumentation, the average blood loss was 1850 cc with an average of 6.1 hours of operating time. Four patients had type I and 3 had type IV curves.

In 3 patients with type IV curve the mean preoperative Cobb angle was 85.3°. In the bending radiograms this curve decreased to 60.6° with an correction rate of 24.5%. Postoperatively Cobb angle measured 38.6° with an correction of 51.9%. All of these patients were brought to physiological sagittal contours.

In 4 patients with type I curves the mean preoperative major curve Cobb angle was 89°. The flexible thoracic curve measured 49.2° averagely. In the bending radiograms these were corrected by 15.2% and 50.2% and decreased to 75.5° and 24.5° respectively. Postoperatively mean major lumbar cobb angle was corrected by 52.6% and decreased to 42.2°. The overall correction rate in the major curve in 7 patients was 40.7° with a correction rate of 52.3%.

Also physiological sagittal contours of the patients were restored. One patient with implant failure whom developed retrolisthesis was revised and posterior instrumentation was added. A solid fusion was observed in all patients.

DISCUSSION

With the introduction of anterior instrumentation, the importance of leaving more lumbar segments unfused has been realized. The incidence of severe lumbar back pain following Harrington instrumentation has been well documented (6). Zielke VDS instrumentation is characterized by an excellent degree of correction (7) but also has some disadvantages: implant failure, pseudoarthrosis and correction loss (8, 9).

There are five primary goals attained by anterior surgery for scoliosis today: 1- to release the anterior structures and allow more correction 2- to decompress the spinal cord 3- to increase the rate and strength of the fusion and prevention of pseudoarthrosis 4- to decrease the growth on the convexity and prevent future progression of the curve. 5- to perform an anterior thoracoplasty.

Anterior release can be indicated in severe infantile or juvenile idiopathic scoliosis for purposes of maximizing the correction rate and preventing the crankshaft phenomenon. A patient with growth potential will continue to grow anteriorly after posterior fusion and will progressively increase the rotation of the curve. After this the magnitude of the curve and thoracic prominence will increase. Lumbar and thoracolumbar curves are excellent candidates or anterior fusions with anterior instrumentation (10).

Alici and Pinar reported that correction rate was 93% with anterior instrumentation in 58 idiopathic scoliosis patients (11). Turi and collaborates point out a slight kyphotic effect with TSRH instrumentation (12). Hopf has presented the first experiences with a new anterior instrumentation developed by Hopf. Dubousset and Cotrel has reported high correction rates with this system when it is used between T4 and L5 (13). In this study each of these three system were used. Although our series is a limited one, the best results were obtained with CDH system.

We evaluated early results of 7 patients with severe idiopathic scoliosis patients. With anterior release and instrumentation a high correction rate was observed. Besides, the advantage of decreased fusion levels this procedure minimizes the blood loss and operating time. In light of these findings it is suggested that although we are at the beginning of a learning curve, encouraging results can be obtained with anterior release and instrumentation in patients with rigid curves.

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