THE ROLE OF COTREL - DUBOUSSET INSTRUMENTATION IN THE SURGICAL TREATMENT OF IDIOPATHIC SCOLIOSIS

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At the Istanbul University, Istanbul Faculty of Medicine, the Department of Orthopaedics and Traumatology, 25 cases of idiopathic scoliosis were treated with the CD method from 18 th Nowember 1988 to 31 st October 1989. Our cases were 16 female and 9 male patients. Their average age was 15.6 years old (range, 12-22). The anlga of scoliosis ranged from 40 degrees to 88 degrees (average, 62 degrees). There was a decrease or loss of thoracic ky-phosis, in 15 of 25 cases. The distribution of the decreased kyphosis angles in these cases were as follows : 20-10 degrees : 4 cases 10-0 degrees : 9 cases 0 degrees : 2 cases

Postoperatively, there was an average 67.4 % improvement (range, 39% - 93%) of the curve in the frontal plane.

Thoracic kyphosis angle in 15 cases, which was less than 20 degrees with the average 6.6 degrees, was measured postoperativly with the average 23 degrees (range, 8-36 degrees). These cases were followed up for a minimum of 4 months and maximum 1 year. The average loss of correction was 2.7 degrees.

Today, it is known that scoliosis is a three-dimensional deformity. Therefore the aim in the treatment is to correct this three-dimensional deformity. The C-D method is used for obtaining a three-dimensional correction (4) and nowadays this method is applied widely in all the western countries (1, 2, 5, 6,7, 8,9, 11, 13, 15, 16, 18).

In this report, we will present the results we obtained in the idiopathic scoliosis cases, who were treated with the C-D method.

MATERIALS

25 idiopathic scoliosis cases, which were treated at İstanbul University, Istanbul Faculty of Medicine, the Department of Orthopaedics and Traumatology from 18th November 1988 to 31 st October 1989 with the C-D method, were our material.

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FINDINGS AND RESULTS

Our cases were 16 female and 9 male patients. Their average age was 15.6 years (range, 12-22).

13 of the curves were thoracic, 10 of them were thoracolumbar and 2 of them were thoracolumbar double-major. The distribution of the curves according to the King Classification is as follows :

King Type I : 2 cases
King Type II : 8 cases
King Type III : 14 cases
King Type IV : lease

The thoracic curves were to the right except in two cases. In the thoracolumbar curves, thoracic ones were to the right and the lumbar ones to the left.

According to the Cobb method, the curves on the frontal plane ranged from 40 degrees to 88 degrees (average 62 degrees).

In 15 of 25 cases, there was a decrease or loss of thoracic kyphosis. Thoracic kyphosis angle between 10° and 20° was evaluated as hypokyphosis, between 0° and 10° as lordosis. An angle of 0 degree or less was evaluated as severe lordosis.

Distiribution of the decreased thoracic kyphosis angle in 15 cases was as follows :

20-10 degrees : 4 cases
10- 0 degrees : 9 cases 0
degree > : 2 cases

Instrumentation was applied to the thoracic curve only in the thoracic curves and King Type II thoracolumbar curves according to the Moe Concept and to both curves in double major curves.

None of the cases were treated with the plaster cast preoperatively.

Postoperative, in one case the lamina of the lower intermediate vertebra was broken. We used plaster corset in this case. We used corset in another case, too, because there was a hook dislodgement from the concave side to the distal neutral vertebra. External fixation was not used in any other case postoperativcly. Postoperative, cases stood up at the 3rd or 4th day.

There was no neurological symptom in any case. In 4 thoracal and rigit curves, costa resection was made to get the derotation. The average intraoperative blood loss was 2.7 units.

The average postoperative correction was 67.4 % (range, 39% - 93%). The decreased kyphosis angle in 15 cases (range, 16 degrees to - 20 degrees; average, 6.6 degrees) changed to average 23 degrees (range, 8 degrees - 36 degrees) postoperatively. The average correction loss was 3 degrees (range, 0-6.4 degrees) in the last follow-up.

The patients were given permission to go to the school at the end of the 3rd week.

DISCUSSION

The goals in the surgical treatment of scoliosis, which King explained very well, is to correct the deformity in three planes, to reconstructive the balance in the spine, to achieve the stability and to fusion the segments as less as possible (11). The superiorities of the applied surgical methods will be due to their degrees to reach these aims. There is no doubt that the neurologic risks on applying, easiness on applying and being economic, and the necessity of a postoperative external fixation will play an important role in the choice, but they will not be the main fact.

In this situation, we had to examine these methods according to their main aims. It is obvious that all the methods for correction of the curve on the frontal plane have similar results. In general, according to the type, the rigidity and the other properties of the curves on this plane are corrected average 50-75% (1,6,8). In our cases, the average correction proportion on this plane was 67.4 %. lnspite of this, it is known that the methods, which have axial distraction effect, brings a better correction on the frontal plane (1,14). Therefore the Luque method is used by combining it with Harrington distraction rods, because this method is not axial, although it is effective on the transverse plane. This method is called Harri Luque. For preventing the obtained correction on this plane, the C-D method is superior to the other methods. In the literatures, it is emphasized that only a loss of some degree is observed in the last follow-up (1,5,8,12,15,18).

But it is obvious that serious problems are present in the correction of the deformity on the sagittal plane. In idiopathic scoliosis, it is known in general, that there is a decrease of several degrees in the thoracic kyphosis. In the same way, decreasing in lumbar lordosis happens in many cases, too (6,8). Thus, in 15 of 25 cases, a thoracal kyphosis angle of average 6.6 degrees was measured. This deformity method. In many cases the deformity is getting worse, so it is now **known** that this method causes a flat-back deformity as a complication (1,2,3,18,19,20). Therefore Moe modified this method so that the hole of the below hook and the rod part which comes to the hole, into a square shaped. Doing we tried to give the rod a contour in the sagittal plane. Moe's this modification is nowadays used very often by the surgeons using the Harrington method (1,14,15,18). It is accepted that Luque, Harri Luque and Drummond methods arc more effective from Harrington method by giving a contour to the rod in the sagittal plane (6,8,10,18). Today, most of the authors have accepted that the C-D instrumentation is the most effective method for correcting the deformity in the sagittal plani (1,2,4,5,6,8,9,11,12,15,17,18). The thoracic kyphosis angle of the deformity in the sagittal plane was average. 6.6 degrees in our 15 cases. Postoperativcly, this angle was average 23 degrees which is a satisfatory result.

Experimental stability studies, which calculates the resistance of the several types of pressure, and clinical observations show that the C-D method is the most truslable one (1,5,7,12,13,16). Therefore there is no need for an external fixation postoperatively in these cases. The correction loss, which was reported in the clinical observations with the C-D method and in the late follow-up of the cases, is very little (average, 2%) (1,2,5,13).

In the scoliosis surgery, one of aims is to include as less as possible vertebra to the fusion, when the three dimensional correction of deformity, is being done. In other words one of our aim is to save more mobil segments (11). Looking from this point, GURR and McAFEE compared the C-D system, Harrington system and Luque system treating several spinal diseases, in. their research. According to this research in C-D system compared to Harrington or

Luque systems, the average number of motion segments spared patients was 1.3 in the spondylolisthesis group, 2 in the tumor group, and 2.1 in the trauma group (9). The same researches showed that the C-D system for the surgical treatment of different problems of lumbar spine makes possible more mobile segments preventation than the other systems (average, 1.6 motion segments) (9).

Of course, it is very important to correct the vertebral rotation, which plays the most important role in the etiology of scoliosis. Clinical studies and experimental researches on several methods show that the C-D method is clearly superior to the others (1,2,15,17).

As a result, it is possible to get a truly three dimensional correction and rigit fixation without needing any external fixation in the surgical treatment of scoliosis with the C-D method.

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