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**More than 20-year follow-up Harrington instrumentation in the treatment of severe idiopathic scoliosis**

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On the basis of our own experience, we would like to support the results reported in the article “Minimum 20-year follow-up results of Harrington rod fusion for idiopathic scoliosis” [ 2 ]. The number of patients that we evaluated and the duration of their follow-up are almost the same as those reported in the article. The only difference is that we evaluated only the patients with severe idiopathic scoliosis and that there was a difference in the application of Harrington rod. It is obvious from the report, especially from Figure 3, that the investigators did not contour the Harrington rod in the sagittal plane. We, on the other hand, always did it. One of our authors ( M.P.), i.e., the one who operated on all the patients, used French rod bender to contour Harrington rod in sagittal plane depending on the length of spondylodesis. He secured the round end of the rod in the lower laminar hook and then squeezed the hook, using special pincer. Thus, the round end of the rod was fixated in the hook, which prevented the rotation during distraction. The first author learned this procedure working with Dr Pierre Stagnara.

With respect to the application of the autologous bone transplant, postoperative immobilization, and rehabilitation, the procedure were followed was the same as the one described by the authors of the article. Between 1980 and 1983, 25 patients, 19 women and 6 men with severe idiopathic scoliosis (Cobb angle  $\geq 70^\circ$ ) were treated with posterior spinal arthrodesis and Harrington instrumentation at our Department. The mean age of patients at the time of intervention was 23 years, ranging from 13 to 31 years. The follow-up lasted 22 years and 5 months on average (range, 22-25 years) and none of the patients were lost. Two patients had a type I curve, 5 had a type II curve, 11 had a type III curve, 5 had a type IV curve, and 2 had a type V curve according to the classification of King et al. [1]. All patients were treated

by Stagnara operative technique and Stagnara postoperative protocol [3]. A junior orthopedic surgeon who did not assist at the operations evaluated all the patients.

The preoperative Cobb angle of the primary curve was 87° on average (range, 74°-125°).

Postoperatively, the curve was 51° on average (range, 35°-85°), i.e. the obtained correction of the curve was 40% (range, 15-58%). Only three patients had to undergo reoperation, one because of pseudarthrosis and two because the caudal hook dislodged. There were no neurological complications. At the most recent follow-up visit, an average loss of correction was 10° (range, 0-22 points). The average spine score was 84 points (range, 26-98 points).

The average level of pain on the analog scale was 2.6 points (range, 0-7.2 points). Actually 23 patients are full-time workers and two patients are employed part-time. None of our patients had a flat back syndrome. In our opinion, it is due to Harrington rod modeling and achieving the balance of the spine in sagittal plane (Figure 1).

Comparing our results with those reported in the article, we concluded that they were almost identical. It should be mentioned, however, that the primary scoliotic curve was reduced practically by the same percentage with respect to the preoperative angle in both groups of patients.

Both studies showed that the long-term effect of Harrington instrumentation can be successful even in severe and adult idiopathic scoliosis. In our opinion, it is possible to achieve grace to Stagnara operative technique (solid spondylodesis, sagittal configuration of the Harrington rod, and rib resection) and Stagnara postoperative treatment.

## **1. References**

2. King HA, Moe JH, Bradford DS, Winter RB ( 1983) The selection of fusion levels in thoracic idiopathic scoliosis. J Bone Joint Surg Am 65:1302-13.
3. Mariconda M, Galasso O, Barca P, Milano C (2005) Minimum 20-year follow-up results of Harrington rod fusion for idiopathic scoliosis. Eur Spine J 14:854-61.
4. Stagnara P ( 1985) Les deformations du rachis.Masson,Paris

### Figure legend

**Fig. 1** Standing sagittal view radiograph with contoured Harrington rod, 23-year-follow up.

