SSI AND GALVESTON PROCEDURES FOR CORRECTION AND STABILIZATION OF NEUROMUSCULAR SCOLIOSIS

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Between 1986 and 1993, spine fusions were performed by SSI-Galveston method in 5 patients with severe pelvic obliquity and by SSI method in the remaining 6 of 11 patients all of whom had neuromuscular scoliosis. 8 (73%) of the patients were female and 3 (27%) were male. The average age at operation was 15,2 years (11-21). Mean follow-up period was 49 months (5-98). Diagnoses included poliomyelitis in 9 cases and Kugelberg-Welander's disease in 2 patients. 7 patients had only posterior fusion while 4 of the patients had also anterior fusion, one with Webb Morley, one with Zielke and two with Alıcı types of instrumentation. Average preoperative scoliosis was 71° (57°-115°). This was corrected to 45° (30°-76°) postoperatively and found to be 51° (31°-82°) at final follow-up. 7 of 8 patients who were not able to walk preoperatively began walking with the help of crutches after the operation. Sublaminal wires in the most proximal level in one patient and in the second distal level of another patient were broken bilaterally. The proximal parts of the rods of the patient whose proximal wires were broken migrated into the subcutaneous tissue. A revision operation was performed ant the rods were shortened but a loss of correction in the thoracic curve happened in that patient.

Key Words : *Neuromuscular scoliosis, SSI, Galveston procedure.*

INTRODUCTION

In patients with neuromuscular scoliosis, vertebral curves most often involve the dorsolumbar and lumbar areas and pelvic obliquity accompanies these malformations frequently[1]. The treatment of neuromuscular scoliosis -a condition which prevents the patient from walking or even sitting- is surgical and involves the fusion of the lumbosacral region. Moreover these patients have other musculoskeletal disorders like CDH, muscle atrophies, hypoplasia of the iliac wings and lumbalgia as well as respiratory problems[2].

The criteria for choosing a surgical procedure are:

1. It should provide lumbosacral fusion.
2. It should provide stable, rigid fixation.
3. There should be no need for extemal fixation postoperatively.

Another important point to remember is that these patients have diminished sources of autogenous bone graft or the present stocks can not be utilized because of the technique used which leads to the high rate of pseudoarthrosis seen in these patients[3, 6].

The pseudoarthrosis rate can be reduced by using posterior and anterior fusion together[5]. In the initial study of Allen and Ferguson with the Galveston procedure, it was assumed that traction and posterior instrumentation was enough but in the late follow-up correction loss and the high pseudoarthrosis rate did not prove this belief[4]. Concomitant use of anterior and posterior fusion brought better results.

MATERIALS AND METHODS

Mid-term follow-up results of 11 patients who underwent spinal surgery for correction and stabilization of neuromuscular scoliosis were evaluated. 8 (73%) of the patients were female and 3 (27%) were male. The average age at operation was 15,2 years (11-21). Mean follow-up period was 49 months (5-98). Diagnoses were poliomyelitis in 9 cases and Kugelberg-Welander's disease in 2 patients. 7 patients had only posterior fusion while 4 of the patients had also anterior fusion, one with Webb Morley, one with Zielke and two with Alıcı types of instrumentation.

RESULTS

Average preoperative scoliosis which had a value of 71° (57°-115°) was corrected to 45° (30°-76°) postoperatively and found to be 51° (31°-82°) at final follow-up. 7 of 8 patients who were not able to walk preoperatively began walking with the help of crutches after the operation. Sublaminal wires in the most proximal level in one patient and in the second distal level of another patient were broken bilaterally. The proximal parts of the rods of the patient whose proximal wires were broken migrated into the subcutaneous tissue. A revision operation was performed and the rods were shortened but a loss of correction in the thoracic curve happened in that patient.

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DISCUSSION

The treatment of neuromuscular scoliosis continues to be a problem despite evolving in instrumentation techniques. The most important point in the treatment of this disorder is the fusion of the lumbosacral region. The inadequacy of posterior fusion alone with its associated high pseudoarthrosis rate has been reported by many authors. The fact that two of the three patients who developed pseudoarthrosis had been treated with only posterior fusion in our series is parellel to this argument.

The hypoplasia of the iliac alae prevent the stable insertion of the rods in the Galveston technique. Furthermore, no autogenous graft can be harvested. The use of allograft in these patients is another cause of failure.

We consider our confidence in the internal fixation and planning our treatment scheme without external fixation (i.e. TLSO) in our early cases as a mistake and now use a brace in the postoperative period.

As a result we believe that treatment schemes including both anterior and posterior fusions in the management of neuromuscular scoliosis provides better outcomes than only posterior procedures.

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