



Congenital Double Scoliosis with 2 Bilaterally Alternant Supranumerary Hemivertebrae and 2 Supranumerary Vertebrae Treated by Growth Guiding Device

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Abstract

This paper presented a special case and shortly described the congenital malformations of a child operated at the age of 2 years and 7 months. Medical literature does not mention the cases of double or triple congenital scoliosis. 54 patients were treated, out of whom, 39 were operated during the period of 2000 and 2012. This series presented 4 patients with double congenital scoliosis and 2 with triple congenital scoliosis. All these axial deviations were due to hemivertebrae with longitudinal imbalance of the spine, if these hemivertebrae were present on a distance of at least 5 normal vertebrae.

Keywords: Congenital double scoliosis; Supernumerary hemivertebra; Posterior hemivertebral spongius enucleation; Supernumerary vertebra; Growth guiding

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Introduction

A patient presented an anal-rectal malformation with rectal-vaginal fistula and a bifid thumb at birth. Parents noticed a spinal deformity at the age of 3 months when bathing and, at the age of 6 months, they presented to our clinic. The X-ray exams revealed a spinal column with 4 supernumerary vertebrae, out of which, 2 hemivertebrae and 2 normal configured thoracic vertebrae, inducing a double curved spinal deformity with 20 and 15 Cobb degrees, respectively. An orthotic treatment was started and the anal-rectal malformation was operated at the age of 8 months. The patient was clinically reevaluated and imaging exams were performed at the age of 2 years and 7 months. An obvious shoulder and pelvic imbalance was noticed. The patient presented a height of 90 cm and a weight of 12.3 kg, the thoraco-lumbar spinal segment being of 26.5 cm (normally being of 24 cm) [1]. The frontal X-ray exam showed a T9-T14 with 45 Cobb degrees and L1-L5 with 36 Cobb degrees double scoliosis. Two supernumerary hemivertebrae were present, T11 left segmented and L2 right hemisegmented hemivertebrae (Figure 1).

The 2 hemivertebrae were alternant bilaterally disposed, 5 normal vertebrae being between them [2]. Two normally configured T13 and T14 supernumerary thoracic vertebrae were also noticed. The right hemithorax presented 15 ribs and the left one 14, respectively. CT, 3D-CT, and MRI exams showed a butterfly T11 vertebra and confirmed the supernumerary T11 segmented and L2 hemisegmented hemivertebrae. The 2 supernumerary hemivertebrae represented the apexes of the scoliotic curves (Figure 2). There were no occult malformations of the spine or medulla.

Preoperatively, 4 possibilities of surgical treatment were taken into account: 2 VEPTR devices, growing rods, hemivertebrae resection with minimal synthesis or supernumerary hemivertebrae resection with the implant of a growth guiding device. A posterior approach with posterior hemivertebral spongius enucleation of the supernumerary T11 and L2 hemivertebrae, blocking the growth in 3 segments, was performed: Right T10-T11 and left T9-T12; T13-T14, corresponding to the supernumerary vertebrae, and L1-L2 segment. The spinal exposure was done only at the hemivertebral spongius enucleation and screw insertion sites. This allowed us to correct the

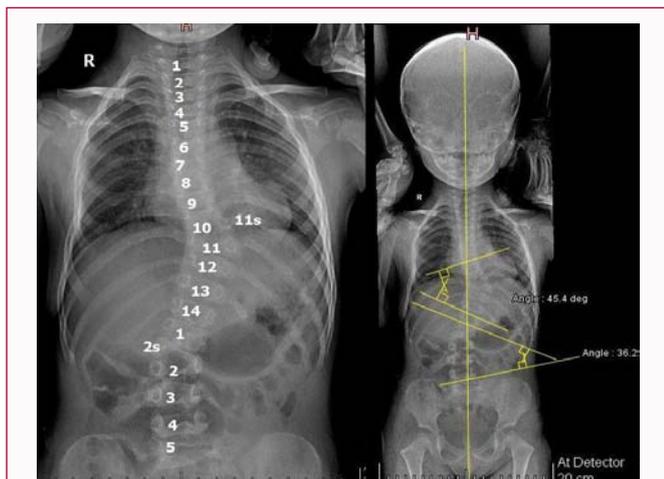


Figure 1: Thoracolumbar double congenital scoliosis with a thoracic segment with 14 normal vertebrae and 2 alternate bilaterally hemivertebrae disposed in the thoracic and lumbar segments, respectively. The scoliotic curves were of 45 Cobb degrees in the thoracic and 36 Cobb degrees in the lumbar area.

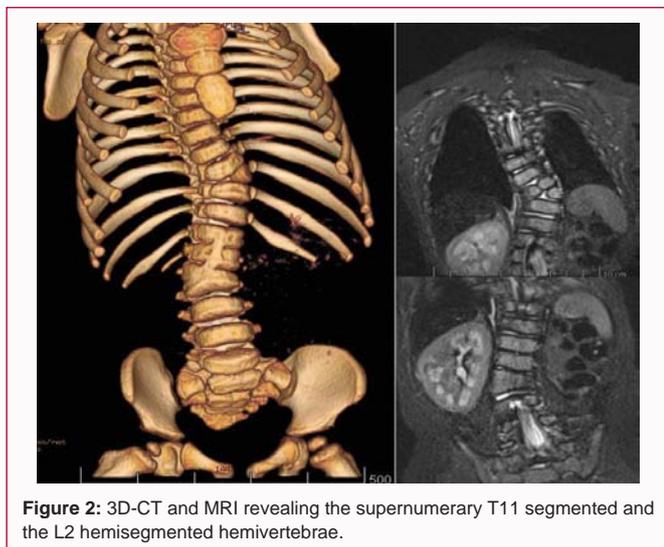


Figure 2: 3D-CT and MRI revealing the supernumerary T11 segmented and the L2 hemisegmented hemivertebrae.

scoliotic curves. The rods were placed subfascial, to avoid long segmental spinal arthrodesis. During the follow-up of 2.6 years, the presence of a lordotic deformity at T13-T14 and the rod cutting in

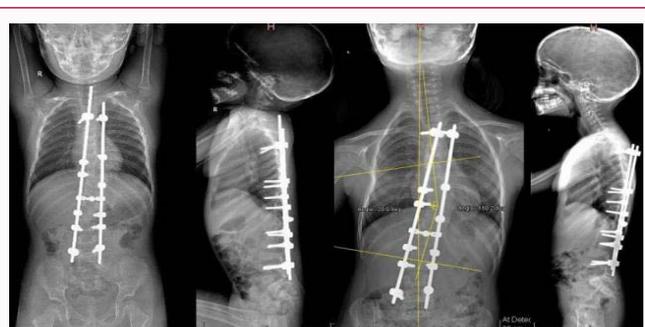


Figure 3: X-rays performed immediately postoperative and 2.6 years after the surgical procedure. The hemi-vertebral spongious enucleation of the supernumerary T11, L2 hemivertebrae, and the growth-guiding device allowing the spinal axis correction. The last follow-up certifies the spinal growth and a 20 degrees Cobb remaining deviation.

this area were looked up in order to unlock the vertebral growth there. No presence of such altering was noticed. Moreover, the Cobb and Fergusson angles are both 20 degrees (Figure 3). The vomero-coccigeo-pubic line and the positioning of the proximal screws highlight the tensions of the biomechanical spinal chains in order to preserve the pelvic, shoulder, and cephalic balances. Many cases of supernumerary vertebrae, which are located cervical, thoracic, or lumbar, are reported in the specialty literature. An 11-year-old child with longiline neck and thorax presented 2 supernumerary vertebrae located cervical and thoracic, associated with polythelia [2]. In our casuistry, out of the 54 patients with congenital scoliosis, we recorded only a case; a 4-year-old girl who presented 3 hemivertebrae located on the same side [3]: A T10 thoracic hemivertebra and 2 L2 and L3 consecutive hemivertebrae.

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