SCRIPTA MEDICA (BRNO) – 73 (3): 179–181, *September 2000*

PARALYTIC SCOLIOSIS – MANAGEMENT AT ADOLESCENT AGE. A CASE REPORT

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A b s t r a c t

The principles of pathophysiology, examination and therapy of paralytic scoliosis are described and the treatment of an adolescent girl who had a previous craniocerebral injury is demonstrated. Collapse of the spine, which made it impossible for her to sit and stand, was the main indication for surgical therapy. The Isola segmental instrumentation with fixation of the pelvis by the Galvestone technique was used to restore the stability of the spine and enable her to sit and stand again. Her respiratory functions also improved.

K e y w o r d s

paralytic scoliosis, operative therapy

INTRODUCTION

Paralytic scoliosis develops due to serious invasion of the upper motor neurone. Other aetiopathogenetic factors include cerebral palsy, spinocerebral degeneration, syringomyelia, tumors, spinal cord injuries and other conditions *(1,2,5).* The case described here was the result of a severe craniocerebral injury. This type of paralytic scoliosis falls into the group of structural neuromuscular neuropatic scolioses.

The clinical manifestation and strategy of therapy in paralytic scoliosis are, in many aspects, different from the course and therapy of classic idiopathic scoliosis. In paralytic scoliosis, clinical examination of the spine often reveals collapse of the spine, with pronounced differences between the severity of the curve when the patient is lying and that when they are sitting or standing. This great unstability of the spine interferes with a stable standing or sitting position and is often accompanied by pelvis decompensation. This condition may also affect respiratory functions.

Radiologic examination includes a full frontal film (in anteroposterior projection) and a lateral view involving the pelvis. To make an objective analysis of curve flexibility, X-ray examination of the spine when the body is passively bent or when the spine is subjected to traction is carried out *(1,2,3,5).*

The treatment of paralytic scoliosis is usually a combination of conservative and operative therapy. In conservative therapy, which is appropriate before growth

acceleration in adolescence, a Milwaukee orthosis is used for upper neurological lesions, or a bivalval orthosis is applied if the curve occurs in the lower thoracolumbal part of the spine. It is essential to note that conservative therapy in this case is not sufficient to correct the deformity and largely serves as a means of preventing later progression of the curve; above all it is used as a support of spine stability in the standing position.

If both progression and unstability of the curve are pronounced, operative therapy is recommended. The basic indications for this operative therapy include:

1. paralysis with an unstable curve
2. inclined, unstable pelvis
3. pronounced progression of the curve during conservative therapy.

The operative treatment of paralytic scoliosis includes a whole range of specific factors. The operative procedure itself and the postoperative treatment always require a great deal of effort. The basic aims of the operative therapy are:

1. to achieve the stability in the sitting position
2. to prevent the development of pressure sores, which may occur during conservative therapy with an orthosis
3. to keep the patient's hands free
4. to maintain respiratory functions

A very important moment of the operation is stable inner fixation which allows us to support the spine to such a degree that postoperative immobilisation in a plaster cast can be avoided.

In paralytic scoliosis, corrective surgery has several specific features. The essential requirements are:

1. rigid instrumentation
2 extensive spondylodesis (at least 2 segments above the border of the neurological lesion)
3. wide intertransversal fusion in the lumbar spine
4. fixation of the pelvis to the trunk

The inner fixation is acomplished with the use of Isola segmental instrumentation according to the Asher method. The pelvis is fixed by the Galveston technique. This combination of methods provides rigid fixation of the spine, very good correction of the deformity and also offers a possibility to avoid postoperative immobilisation of the patient in a plaster cast or an orthosis *(4)*.

CASE REPORT

A 12-year-old girl was involved in a car accident and was severely injured in 1993. She suffered a serious craniocerebral injury, which led to a coma and numerous haemorrhagic lesions in the brain.This was followed by the state of deep unconsciousness for 6 weeks and resulted in the development of central quadruparesis which was more expressed in the lower extremities. After her condition had stabilised, she was sent to the Social Care Institute at Kociánka, Brno. She underwent physical therapy and rehabilitation and learned to sit and to walk with the use of a walker. However, her progress was negatively affected by considerable instability of the spine and increasing severity

of the curve, along with instability of the pelvis. These problems were later accompanied by respiratory difficulties. A continuous increase in pelvis instability was taken as an indication for operative therapy. In 1998 her deformity was corrected and her spine was fixed using Isola instrumentation with sublaminar loops, transpendicular fixational screws and transversal connectors. Simultaneously, the pelvis was fixed using the Galvestone technique of sacrum and iliac bone stabilisation. After decortication, the instrumentation was supplemented by extensive posterior spondylodesis in the range of T6 – S2. The instrumentaion provided sufficient stability and postoperative external fixation was not necessary. One year after the operation, the patient could stand up and also walk supported by crutches; she could assume and maintain a sitting position. Our results show that surgical management of paralytic scoliosis improves patients'quality of life and permits full maintenance of their respiratory functions. It is, therefore, very important to recognise the indications for operative treatment in the early stages of the disorder.

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PARALYTICKÁ SKOLIOTICKÁ KŘIVKA – OŠETŘENÍ V OBDOBÍ DOSPÍVÁNÍ

S o u h r n

Příspěvek předkládá základní principy etiopatogeneze, vyšetření a terapie paralytické skoliotické křivky. Na podkladě kazuistiky ošetření dívky s paralytickou křivkou, vzniklou v období dospívání po kraniocerebrálním poranění, poukazujeme na nutnost časné operační terapie zajišťující stabilitu páteře. Indikací k operační terapii byl právě značný kolaps a nestabilita páteře, které pacientce znemožňovaly stabilní sed i vertikalizaci. K ošetření křivky byla užita Asherova technika segmentální instrumentace s fixací pánve dle Galvestonea. Takto byla dosažena kvalitní stabilita sedu i chůze o berlích a zlepšeny respirační funkce pacientky.

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