Spinal tumors in children: a rare disease

Tumors of the Central Nervous System (CNS) are one of the first causes of morbidity and mortality in children in developed countries. Among them, spinal tumors are estimated to account for less than 10% of the cases, and are therefore considered to be a rare disease. Besides that, they are heterogeneous in terms of clinical presentation and evolution. Their treatment is also complicated because it requires dealing both with the disease and the need to preserve the spinal stability. As a consequence, the result is often suboptimal. We analyzed a series of 134 pediatric patients admitted during 17 years in a single unit of pediatric neurosurgery with the aim to understand peculiarities and pitfalls in the management of pediatric spinal tumors.

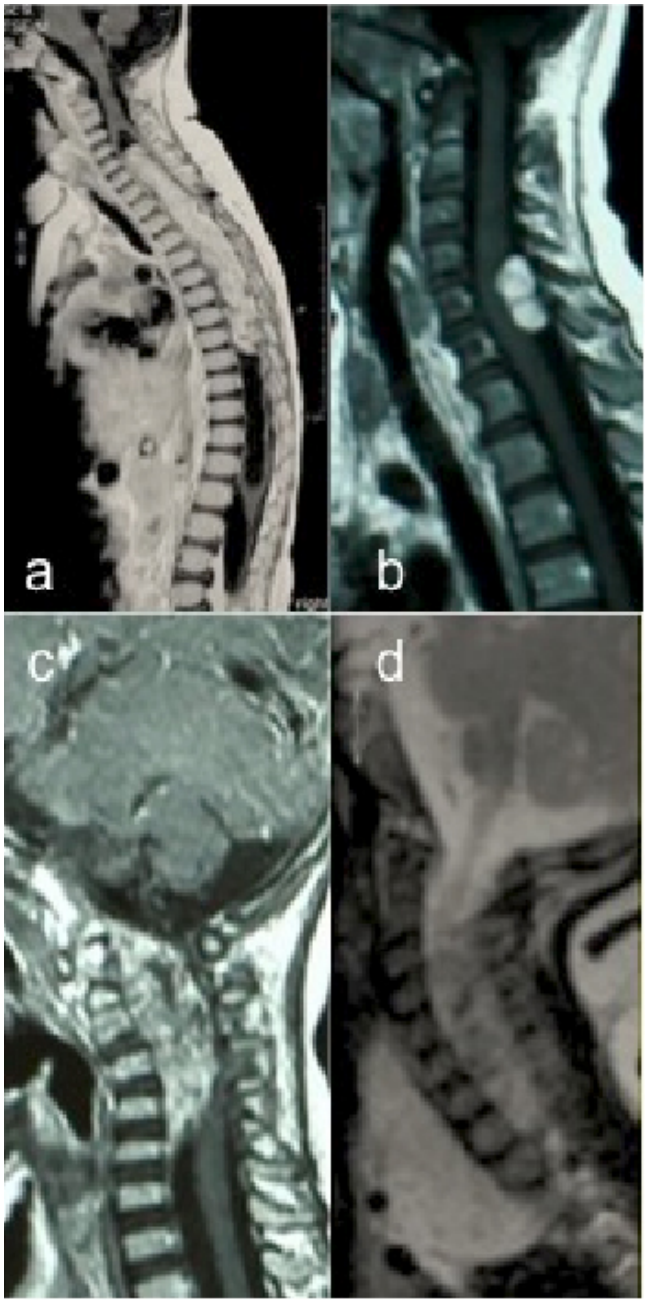

Fig. 1. Type of tumors divided according to their relationship with the spinal cord, the meninges, and the bone: (A) intramedullary tumor; (B) intradural extramedullary tumor; (C) extradural tumor; and (D) paravertebral tumor.

The analysis of our data showed that spinal tumors accounted for 7.7% of the patients admitted during the same time for CNS tumors, with a male to female ratio of 1.3:1. The diagnosis happened at a mean age of 8.5 years, but was more common in children younger than 36 months or aged 10

to 15 years (table 1). The most common clinical presentation was back pain (54 patients, 40.3%) followed by neurological deficit (30 patients, 22.5%)and palpable mass (17 patients, 12.7%). While patients with neurological deficit were directly investigated with MRI and received a prompt diagnosis, many of the others received at first different treatments, such as medical treatment or physiotherapy, and this resulted in a mean delay to reach the diagnosis of 5.6 months after the first clinical presentation. As a consequence the clinical examination at diagnosis worsened: pain was present in 65 patients (48.5%) and neurological deficit in 80 patients (59.7%).

Tumors were divided according to their anatomical relationships with the vertebral bones, the meninges and the CNS into four groups: intra medullary, when they developed inside the spinal cord; intra dural extra medullary, when they developed outside the spinal cord but inside the dura mater; extradural, when they developed inside the spinal canal but outside the dura mater; and para vertebral (Fig. 1).

All patients were treated with the aim to obtain a gross total surgical resection. Whenever possible the approach was through an osteoplastic laminotomy, a surgical technique that allows to put back the bone in the original position and to reduce the risk of postoperative spinal deformity. The result of the histological examination of the tumors resulted in 29 different types of tumor, with low grade gliomas being the most common.

At last follow up (mean 28 months, minimum 3 months, maximum 13 years), 5 patients (3.7%) required further surgery for spinal instability; 12 patients (8.9%) had a recurrence of the disease; 8 patients (5.9%) had neurologically worsened; 16 (11.9%) had died.

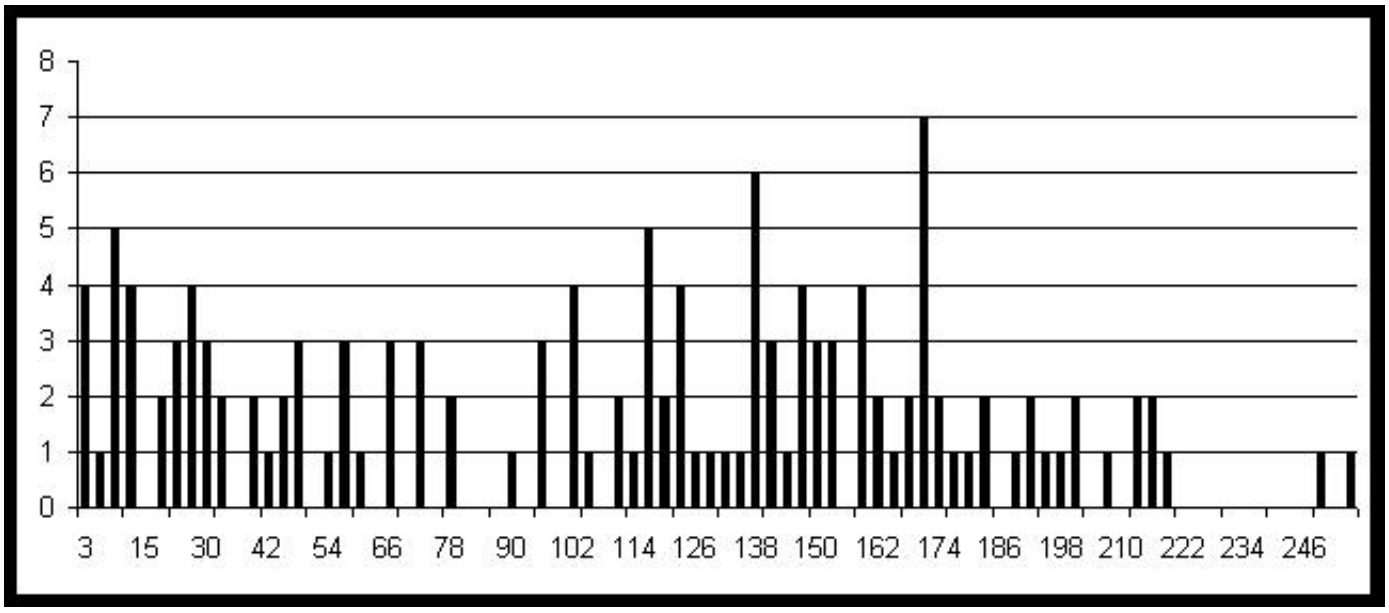

Fig. 2. Distribution of patients according to age in months at diagnosis. X, time in months; Y, number of patients.

We can conclude that even if this study suffers from the limits of a retrospective study, it evidences at least two points that may contribute to a better outcome in children with spinal tumors: back pain in children should not be underestimated and osteoplastic laminotomy followed by a custom-made orthosis appears to reduce the risk of spinal instability.

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Publication

Spinal tumors in children: long-term retrospective evaluation of a series of 134 cases treated in a single unit of pediatric neurosurgery.
Spacca B, Giordano F, Donati P, Genitori L
Spine J. 2015 Sep 1