

Osteoblastoma of the Spine : Spinal Stabilisation with a Plate and Two Screws

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ABSTRACT

This is a case report of an adolescent girl with an osteoblastoma of the lumbar spine. Following excision of the tumour, the spine was stabilised unilaterally with a dynamic compression plate, two pedicular screws, and posterolateral fusion on the affected side. The aim of this article is to highlight the use of this unconventional technique in stabilising the affected segment. So far, nowhere in the literature search has this technique been found to be used.

CASE REPORT

An eighteen-year-old girl presented to the Scoliosis Clinic, University of Malaya Medical Centre, with a history of an insidious onset of back pain of one year duration but getting worse over the last six months. The pain was localised to the lower back and aggravated by coughing and movement. The pain was relieved by analgesics, but lately it had begun disturbing her sleep. There was no abnormal sensation or weakness affecting the lower limbs. There was no history of trauma or features of infection such as fever, night sweat, etc. Both bladder and bowel functions were normal.

Physically, she was a slim girl of medium height and the spine examination showed mild scoliosis with convexity to the left and tenderness over the L4/L5 level. Spine movement was restricted to about 20 degrees of forward flexion, no extension, and lateral bendings reduced to less than 10 degrees bilaterally. Straight-leg raising test was limited to 30 degrees bilaterally because of pain due to hamstring tightness. Muscle power, reflexes, tone, and gait were normal. Plain radiography showed a mild scoliosis of Cobb's angle of 18 degrees with convexity to the left. There was a lesion in the fourth lumbar vertebra which involved the pedicle on the right

side with calcification specks superiorly. Computed tomography cut of the involved vertebra showed the tumour extending into the right side of the spinal canal and displacing the thecal sac (Fig. 1).

The patient was operated on and, following laminectomy, the tumour was found to involve the right lamina and extended into the pars and both the superior and inferior facets ipsilaterally. The whole growth was excised piecemeal and the spinal canal was inspected to make sure that the thecal sac was free of any compressive elements.

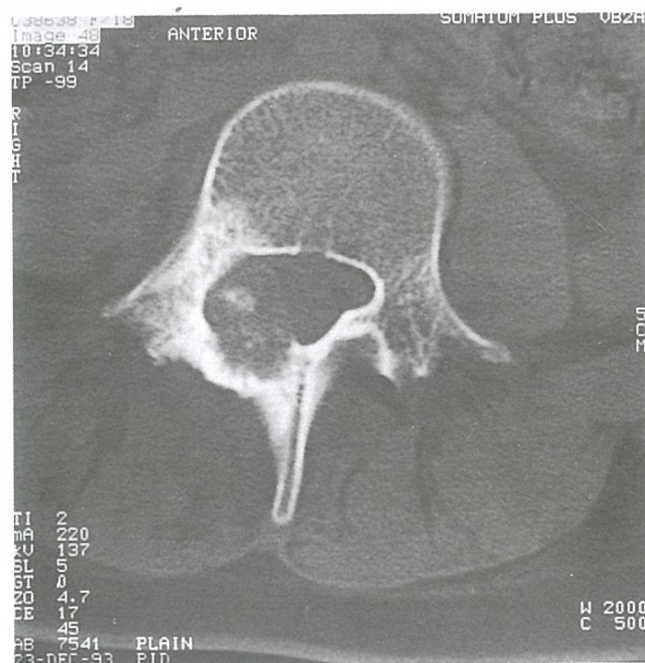


Fig. 1 The CT scan cut showed sclerosis with some erosion over the right pedicle and lamina of the fourth vertebra. There was a calcified soft tissue mass extending from the same area into the right of the spinal canal, abutting and displacing the thecal sac.

Under the guidance of an image intensifier, two 2.0 mm Kirschner wires were inserted into the right pedicles of the third and fifth vertebrae using the Roy-Camille method. A four-hole narrow dynamic compression plate was then contoured to the natural lordotic curve of the lumbar spine and the two end holes were then slipped onto the Kirschner wires and allowed to settle down. Satisfied with the plate position, the two Kirschner wires were removed and two 4.5 mm long fully threaded cancellous screws of size 6.5 mm were inserted into the tracks of those wires and tightened on top of the plate. The exposed dura was overlaid with fat graft and right posterolateral fusion was performed using cancellous bone taken from the right iliac crest. The skin incision was closed in layers. Histopathological examination of the bone tissue confirmed it to be osteoblastoma.

Postoperatively, she made an uneventful recovery and seven days post-surgery she was put in an underarm plaster cast for a period of two months.

Four months later she was completely pain-free. Forward flexion had increased to 85 degrees, both lateral bendings were now up to 20 degrees each, and the straight-leg raisings were easily done up to 80 degrees bilaterally without any hamstring spasm. Clinically the spine still showed residual scoliosis.

In the third year of the follow-up, she complained only of discomfort on the surgical scar at the lower back. Clinically, the spine was straight and she was able to bend 85 degrees forward, lateral bending of 25 degrees bilaterally, back extension of 10 degrees, and both legs could be raised easily to 90 degrees without any pain. Radiograph of her back still showed a residual scoliosis of 10 degrees, the implant in situ with bone bridging the plate (Fig. 2).

DISCUSSION

Osteoblastoma is defined as a benign or locally aggressive tumour with a histological structure similar to that of osteoid osteoma, but characterised by its large size (usually more than 1.5 cm) and typically by the absence of a surrounding zone of conspicuous reactive bone formation¹. Nemoto et al² found that, in 75 cases, spine osteoblastoma occurred most frequently in the cervical spine (39%), followed by the lumbar (17%), thoracic (17%), and sacrum (13%). They found the posterior elements to be the most often affected. Apart from pain, the typical presentation is scoliosis (the tumour is located in the concavity and at the apex of the curve) probably due to irritation of the paraspinal muscle³. Internal fixation of the spine following tumour excision is the preferred method of treatment now even though the patient can do well with just excision of tumour followed by fusion^{4,5}. There is often segmental instability after laminectomy and excision of the posterior elements. The role of internal fixation is to provide stability till fusion takes hold and it even

enhances early fusion. It prevents translation of the motion segments allowing compressive loads to be transmitted through the bodies and discs^{6,7,8,9}. In this particular case, a single plate and two pedicle screws were used on the involved side while the facet-joint complex on the opposite side was deemed stable enough and thus it was unnecessary for any implant on that side¹⁰. Furthermore, the morbidity risk associated with pedicular screw insertion is reduced.

The fact that after three years the implant has not failed is a testimony to its strength. It is felt that this unconventional technique is suitable for cost effectiveness and in cases with unilateral instability¹¹.

ACKNOWLEDGEMENT

I would like to extend my condolence to the family of the late Dr. N. Subramaniam on his demise and gratitude for allowing me to present this case report of his patient (whereby Dr. Subramanian was the principal surgeon operating and he had also reviewed the preliminary article before his untimely death).

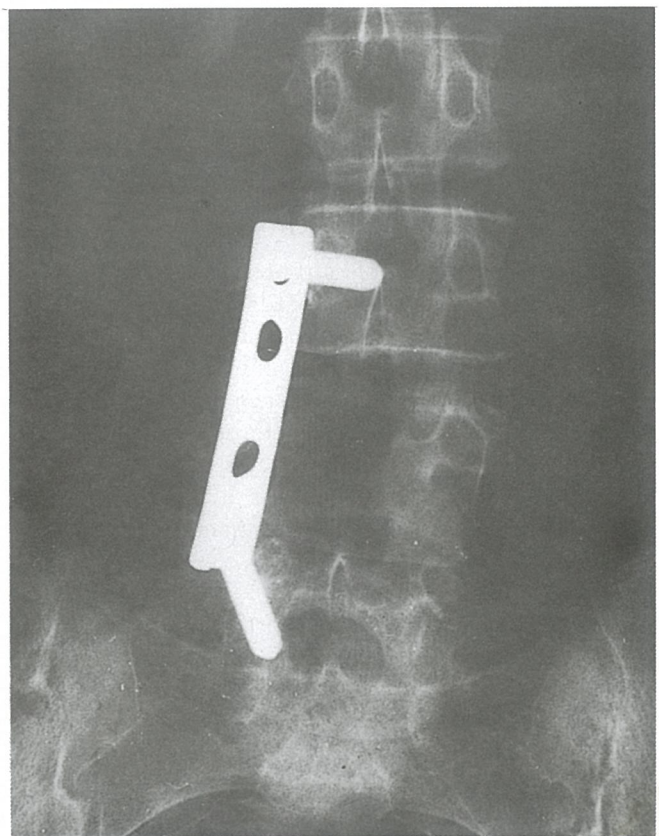


Fig. 2 Three years following surgery. This is the anteroposterior view of the plain X-ray showing the plate and screws in situ. A bone bridge, resulting from the posterolateral fusion, is to the right of the plate. Bone is slowly forming, filling the void left by the excision. The residual scoliosis is seen.

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