Pedicle fracture after successfully posterior spinal fusion for adult idiopathic scoliosis

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DOI: https://doi.org/10.22271/ortho.2022.v8.i3c.3190

Abstract
Study design: A Case report.
Objective: To report a case of atraumatic pedicle fracture for idiopathic scoliosis after posterior spinal fusion.
Summary of background data: Pedicle fracture after posterior spinal fusion for idiopathic scoliosis is rare, with only few cases reported in the literature.
Conclusions: Pedicle fracture in idiopathic scoliosis after posterior spinal fusion is a rare long-term complication. In this case report, we report successful treatment of a fracture.

Keywords: Pedicle fracture, idiopathic scoliosis and posterior spinal fusion

Introduction
Scoliosis is a deformity of the spine and trunk which considered as a 3-dimensional deformity. 80% of all scoliosis is idiopathic while 20% of scoliosis cases can be neuromuscular, syndromic, or congenital disorders. The prevalence rate of adult idiopathic scoliosis ranges from 0.47-5.2%. The severity and prevalence of scoliosis is higher in girls than in boys. In mild curves 10° to 20°, the female to male ratio is 1.4:1. Also, the ratio is 7.2:1 in severe curves >40°. In 1970s, instrumented posterior fusion using pedicle screws has been the mainstay of the surgical correction of idiopathic scoliosis since it was popularized by Roy-Camille [1]. However, posterior fusion is often demonstrated by further progression of deformity, pain and failure of instrumentation. Pedicles have a higher mechanical strength than pars interarticularis. Therefore, pedicle fractures in the spine are uncommon [2]. Pedicle fracture is a rare long-term complication of spine fusion for idiopathic scoliosis [3]. In altered spine biomechanics, pedicle fractures have been described [4]. Gunzbyrg reported on three patients with pedicle fractures two of them were unilateral on the contralateral side to spondylolisthesis in 1991 [5].

Materials and Methods
Case report.

Case Presentation
A 23-year-old female who has underwent posterior spinal fixation and fusion from T4 to L5 for adolescent idiopathic scoliosis when she was 17 years old. Initially she presented to the spine clinic with her parents after noticing gait imbalance and back deformity. On clinical evaluation, she had flexible thoracolumbar curve on bending forward and to the sides with right hump. X-ray whole spine showed thoracolumbar Kyphoscoliosis with no hemivertebra or bras, right thoracic curve 61 degree and left lumbar curve 45 degree with pelvic tilt 60 degree and rizzer 5 (fig. 1-2). On regular follow up post-surgery over 5 years, patient was not complaining of pain, and she was doing her daily activities within normal limits.

At the age of 22, she presented to the clinic complaining of insidious axial low back pain with no associated symptoms or constitutional symptoms with no history of trauma. Physical examination revealed lower back tenderness with normal lower limb neurological exam.
Plain radiographs showed neither screw or rods have loosened or broken (fig. 3-4). Conservative management in form of oral analgesic, NSAID, local cortisone injection and physical therapy were implicated but with no improvement. Further evaluation with CT scan showed adequate osseous fusion of the instrumented segment and fractured L5 right pedicle (fig. 5-6) for which she was prepared for and underwent removal of all screws and rods and thoracolumbar orthosis was applied (fig. 7-8). At 6, 12 weeks and 6, 12 months clinic follow up post the surgery, she was able to resume her daily life activities with no complain.

**Discussion**

Fracture pedicle is a rare long-term complication of posterior spinal fusion for idiopathic scoliosis with few reported cases. Sudden back pain without any history of trauma was the main presenting complain like our study. Therefore, following posterior spinal fusion evaluation of back pain can be difficult and in order to facilitate the diagnosis of pedicle fracture Computed Tomographic scan was obtained in all cases. Knight and Chan reported a case of bilateral pedicle fractures below a solid T3-L3 fusion using a single Harrington distraction rod for idiopathic scoliosis which was treated by an anterior L2-L3 interbody fusion. Nevertheless, patient had persistent back pain [6]. While Clifford and David reported bilateral stress fracture of L4 pedicles post posterior spinal fusion from T3 to L4 using Cotrel-Dubousset segmental instrumentation and autologous iliac crest bone graft without pedicle screws which was successfully treated by bracing and restriction of activities [7]. In this case, the patient underwent posterior spinal fusion from T4 to L5 using transpedicular screw complicated with pedicle fracture of L5 which was treated by removal of all implants and bracing which showed good respond to the conservative management. In one year follow up, patient was not complaining of pain with completely healed fracture.

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