

Sacral Window For the Surgery of L5 Neurofibroma: A Technical Note

L5 Nörofibrom Cerrahisi için Sakral Pencere: Bir Teknik Not

ABSTRACT

OBJECTIVE: To describe a way to increase the exposure for L5-S1 neurofibroma extending to presacral area.

Summary of Background Data: Since the neurofibromas of L5-S1 level generally extend to the extraforaminal and presacral area, their resection is difficult compared to other lumbar levels.

METHODS: A 46-year-old female presented with severe pain in her left leg. There was a mild motor power loss in her left ankle and toe at plantar and dorsiflexion, and a mild hypoesthesia in the posterior of the left foot and its base. Lumbar computed tomography and magnetic resonance imaging showed a mass in the left intervertebral foramen extending to the extraforaminal presacral area at the level of L5-S1. The tumor was removed through a surgical bone window in the base of the sacrum and resection of L5 transverse process on the left side.

RESULT: The tumor was removed totally. Following surgery, the patient's pain had totally disappeared and there was no alteration in her neurological status.

CONCLUSION: L5-S1 neurofibroma was totally resected through a surgical window in the base of the sacrum.

KEY WORDS: Neurofibroma, Sacrum, Surgical approach

ÖZ

AMAÇ: L5 ve presakral alan arasında yerleşmiş nörofibromlara yaklaşım için bir yol tanımlamak.

YÖNTEM ve GEREÇ: 46 yaşında bayan sol bacağına şiddetli ağrı ile kliniğe kabul edildi. Sol ayak bileğinde ve sol ayak başparmağında dorsifleksiyonda (4/5) kuvvet kaybı tesbit edildi. Sol ayak arka yüzünde ve ayak tabanında orta derecede duyu kaybı tesbit edildi. Bel omurgası ile sakrumun bilgisayarlı tomografisi manyetik rezonans görüntülemesinde: sol L5-S1 mesafesinde sol intervertebral foramenden ekstraforaminal presakral alana uzanan kitle lezyonu görüldü. Sakrum kaidesinde pencere şeklinde ostetomi ile birlikte sol L5 transverse proses ve L5-S1 eklem rezeksiyonu yapılarak tümör eksizyonu yapıldı.

BULGULAR: Ameliyat sonrası dönemde; hastanın ağrısı tamamen geçti ve nörolojik düzeyde herhangi bir değişiklik olmadı.

SONUÇ: Sakrum bazalinde cerrahi bir pencere açılması ile L5 yerleşimli nörofibromalara geniş bir yaklaşım ile total tümör rezeksiyonu yapılabilir.

ANAHTAR SÖZCÜKLER: Nörofibrom, Presakral alan, Sacral pencere, Cerrahi yaklaşım

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INTRODUCTION

Various approaches can be used in treatment of neurofibromas which originate from L5-S1 and extend to the presacral area, according to the size and localization of tumor (2, 4). We successfully used a previously described approach for far lateral disc herniation in our case for the treatment of extraforaminally extended neurofibroma at L5-S1.

CASE REPORT

A 46-year-old female patient presented with severe pain in her left leg. She had been suffering from an intermittent and progressive leg pain for 2 years not responsive to medical therapy. Left achilles reflex could not be obtained in the neurological examination. There was mild motor power loss in her left ankle and toe at plantar and dorsi-flexion, and mild hypoesthesia in the posterior of her left foot and its base. Serological tests were normal. A mass was detected on lumbar computed tomography and magnetic resonance imaging, which was intradural and located at the level of L5-S1, extending from the left intervertebral foramen to the extraforaminal presacral area and that showed contrast enhancement (Figure 1A).

SURGICAL TECHNIQUE

The para-articular notch is used for orientation of the roof of the intervertebral canal and the iliac crest for lateral orientation (3). Muller’s bony triangle was then drilled and the intra-extraforaminal part of the tumor was exposed. The tumor was compressing the L5 root. Segmental nutritional branches from lumbar arteries were feeding the tumor in this region. By drilling the bony triangle, the presacral extending part of the tumor was exposed. Additionally, the transverse process of L5 was removed in order to facilitate a wide point of view in the presacral approach.

Total resection of the mass was performed with this technique (Figure 1B-C). Following surgery, the patient’s pain had totally disappeared and there was no alteration in her neurological status.

DISCUSSION

Since the crista iliaca covers the lateral part of the extraforaminal space at the L5-S1 level, surgical exposure of this level is difficult in contrast to other lumbar levels (3). Muller and Reulen described the tangential approach for the far lateral disc herniation at this level, which was less harmful for the related

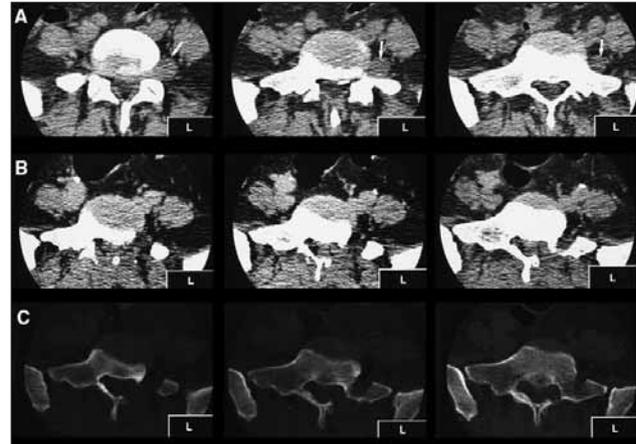


Figure 1: A; Tumor tissue (white arrow), extending to the extraforaminal and presacral area at the L5-S1 level. B; the tumor tissue was removed totally. C; Removed bone parts (lamina, unilateral facet joint and Muller’s bony triangle) at this level.

anatomical structures (3). Drilling a bony triangle called the “operative window” is crucial for this approach. This triangle is formed by the wing of the iliac bone laterally, the isthmus of L5 vertebra’s lamina and L5-S1 apophysial joint medially, distal edge of the pedicle and transverse process superiorly, and the costal process of sacrum inferiorly (Figure 2). The computed tomography sections revealed similarity of tumor localization to the far lateral disc herniation (Figure 1A). Also, these images explained the L5 root compression signs. Hence, we planned to combine the standard posterior approach for tumor excision in the spinal canal with Muller’s tangential approach. A central line incision was made in our case in the consequence of simplicity in reaching the intraspinal

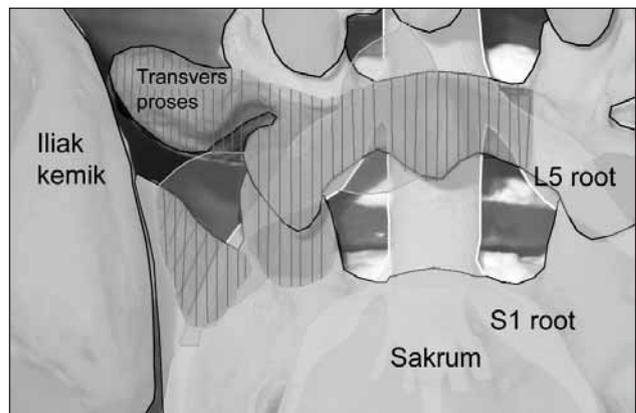


Figure 2: Removed bone parts (gray area) on the model. Black-lined area: Muller’s bony triangle.

and extraforaminal areas. Facet joint was removed due to the size of the tumor and its location. Sacral bone drilling was initiated from the para-articular notch as described and advised for anatomical orientation.

Instability may occur in cases where total laminectomy is performed with unilateral removal of the facet joint, and in these cases, instrumentation may be necessary (1). The sacrum, an anatomical structure on which a screw can be placed, must therefore be protected during drilling. There was no instability for our case in the 1-year follow-up.

In conclusion, the simple posterior approach is usually used of the surgical treatment of intra/ extra spinal neurofibromas. The postero-lateral approach or combined anterior and posterior approach can be used for dumbbell neurinomas (4) but these surgical techniques cannot remove far lateral presacral tumor tissue totally at the L5-S1 level as the surgical

exposure is difficult for the far lateral presacral area at this level. Drilling an "operative window", which was defined in Muller's tangential approach for L5-S1 far lateral disc hernia, makes an important contribution to the removal of tumor tissue in extraforaminal and presacral areas at this level.

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