

Residue Bone Wax Simulating Spinal Tumour: A Case Report

Spinal Tümör Görünümünde Kalıntı (Rezidü) Bone Wax: Olgu Sunumu

ABSTRACT

Bone wax is primarily used in case of bleeding of the diploic vessels of the bones in surgical procedures. It is useful in neurosurgical procedures because of its inert, nonreactive characteristics. Bone wax is safe material and its use rarely leads to complications but there may be complications of over use. It can cause direct pressure of neural tissue as a mass, simulating tumour with the symptoms and on MRI. In the present case the authors evaluated the signs and symptoms, diagnosis, surgical treatment, and outcome in a patient with an unusual sequestered mass simulating a spinal tumour or another space-occupying lesion on preoperative MR imaging. A 64-year-old woman was admitted to the Neurosurgery Clinic with a 10 year history of low back pain, 1-year history of gait disorder, leg weakness, paraparesis, and 1-month history of urinary incontinence and weight loss. T1-weighted sagittal MRI showed the L3 hemilaminectomy, discectomy defect, heterogeneous hyperintense extradural mass and spinal stenosis extending from L2. A hypointense mass relative to the spinal structures was detected in T2-weighted axial MR images. The provisional diagnosis of a cauda equina syndrome and intra- or extradural spinal tumour was made. The patient underwent an L2 total laminectomy. In our case the fragment was seen in the epidural space, under the lamina of L2. The histopathology showed granulation tissue, inflammatory cells, macrophages and multinuclear giant cells. Postoperatively the patient's neurological findings recovered quickly and she began to walk more comfortably.

KEYWORDS: Bone wax, Lumbar disc surgery, Tumour

ÖZ

Bone wax cerrahi operasyonlarda kemik kanamasının hemostazında kullanılır. Nöroşirurjik girişimlerde genellikle reaksiyon vermez ve kolay uygulanabilir. Ancak nadiren aşırı miktarlarda kullanılmasına bağlı komplikasyona neden olduğundan çoğunlukla güvenle kullanılan bir materyaldir. Nöral dokuya direkt bası yapabilir. Bu bası olgumuzdaki gibi MRG'de tümör izlenimi ve kliniği oluşturabilir. 64 yaşında bayan hasta 10 yıldır süren kronik bel ağrısı, 1 yıldır yürümede zorlanma, bacaklarda güçsüzlük ve 1 aydır idrar kaçırma şikayetleri ile kliniğimize yatırıldı. Hikayesinde 23 yıl önce lomber operasyon geçirdiği öğrenildi. Nörolojik muayenesinde paraparezi ve bilateral Babinski ekstansör olarak saptandı. T1 ağırlıklı manyetik rezonans görüntülerde L3 hemilaminektomi, disektomi defekti, hiperintens kitle ve L2 seviyesinde spinal kanalda darlık görüldü. T2 ağırlıklı görüntülerde spinal korda basan kitlenin hipointens olduğu görüldü. Muayene ve tetkiklerle intra ya da ekstradural tümöral kitle düşünüldü. Posterior yaklaşımla L2 total laminektomi yapıldı. L2 laminasının altında bone wax materyali görüldü ve çıkartıldı. Histopatolojisinde granülasyon dokusu, inflamasyon hücreleri; lenfositler, makrofajlar ve multinükleer dev hücreler görüldü. Operasyon sonrası hastanın nörolojik bulgularında hızlı düzelme oldu ve yürümesi rahatladı.

ANAHTAR SÖZCÜKLER: Bone wax, Lomber disk cerrahisi, Tümör

H. Selim KARABEKİR
Serhat KORKMAZ

Afyon Kocatepe University,
Department of Neurosurgery,
Afyonkarahisar, Turkey

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Correspondence address:
H. Selim KARABEKİR
E-mail: hskarabekir@hotmail.com

INTRODUCTION

Bone wax is routinely used in orthopedics, thoracic surgery, neurosurgery, and craniofacial surgery to reduce bleeding from bony structures. It has no inherent haemostatic quality but its effect is to tamponade the marrow spaces. Although Bone wax is a non-absorbable material and therefore might cause a chronic inflammation, only a few case reports have described symptomatic complications after the use of bone wax. It may lead to complications such as granuloma, allergic reaction, infection or epistaxis (3,5). It may also lead to of clinical symptoms caused by compression and can even simulate a tumour as in our case. In the present case, the MRI findings, compression, and weight loss indicated a possible tumour. Residue bone wax like a mass simulating a spinal tumour in appearance with compression symptomatology was encountered during the course of surgery. The pathological findings confirmed the intraoperative observation of chronic granulation tissue around fragments of bone wax. No tumour was seen within the specimen. An atypically located mass in the spinal region should be considered in the differential diagnosis in patients with MR imaging data indicating spinal space-occupying disorders such as primary or metastatic tumours.

CASE REPORT

A64-year-old woman was admitted to the Kocatepe University School of Medicine Neurosurgery Clinic with a 10-year history of low back pain, 1-year history of gait disorder, leg weakness, paraparesis and 1-month history of urinary incontinence and weight loss. The patient's history revealed lumbar surgery performed 23 year earlier. The lower extremity motor exam showed paraparesis, normal bilateral deep tendon reflexes and hypoesthesia under the L2-L3 dermatomes. Sacral sensation, position and vibration senses were weak. The leg strain test, anal sphincter tonus and function was normal. The Babinski reflex was extensor. Clonus was absent. T1-weighted sagittal magnetic resonance imaging showed the L3 hemilaminectomy, discectomy defect, hyperintense extradural mass and spinal stenosis extending from L2 to L3 (Figure 1). On T2-weighted axial images, this mass was hypointense compared to the spinal cord (Figure 2). The provisional diagnosis of cauda equina syndrome and extradural spinal tumour was made. The patient underwent an L2 total laminectomy. There was no tumoral tissue. We found

bone wax material under the L2 lamina (Figure 3). Histopathological examination revealed that the infiltration of inflammatory cells was composed of lymphocytes, macrophages, and foreign body type multinucleated giant cells. These features were evaluated as consistent with granulation tissue.



Figure 1: Sagittal T1-weighted lumbar MRI showing a heterogeneous hyperintense extradural mass at the L2 level (arrow).



Figure 2: Axial T2-weighted lumbar MRI showing a hypointense mass relative to the spinal structures (arrow).



Figure 3: Bone wax material under the L2 lamina (arrow).

Postoperatively the patient did well and had a rapid and complete recovery..

DISCUSSION

Bone wax is a soft, sterile, nonabsorbable mixture of beeswax, paraffin and isopropyl palmitate. Only a few clinical studies have examined the complications of bone wax which induces a mild inflammatory response as a foreign body (1,4-6). Although it is an inert and nonreactive agent, the widespread use of bone wax may lead to complications such as granuloma, allergic reaction, infection, or epistaxis(1). The other complication associated with bone wax is the development of clinical symptoms caused by compression.

There are few clinical and experimental studies that have explored the complications associated with the use of bone wax in neurosurgical procedures. The postoperative compressive effect of bone wax is rarely described in the literature. Cirak et al. discussed a case of iatrogenic quadriplegia that occurred after a cervical operation because of extreme use of bone wax to prevent bleeding during the operation (2). Ates et al. described a foreign body granuloma and the compressive effects of bone wax in the medulla oblongata after a posterior fossa operation (1). Patel et al. advised that any bone wax fragment found in soft tissue should be removed. Aseptic surgical techniques are important in preventing other possible complications such as infection and delayed healing, which may be compounded by bone wax usage (3).

In the present case, residue bone wax was encountered a mass simulating spinal tumour with relevant clinical symptomatology. T1-weighted MRI images showed L3 hemilaminectomy, a discectomy defect, a hyperintense extradural mass and spinal stenosis extending from L2. This mass was hypointense compared to the spinal cord in the T2-weighted images. The provisional diagnosis of cauda equina syndrome and extradural spinal tumour was made

Bone wax (beeswax) is an unresorbable haemostatic bone sealant which induces chronic inflammation in the spinal region postoperatively and can cause several reported side effects. Surgeons should recognize that bone wax is a foreign body and that there is always a possibility of foreign body granulomas following its use (3).

Although bone wax can be safely used routinely used during spinal surgery, its use may lead to significant complications that might even simulate a tumour. This case report suggests that bone wax may be confused with a tumour because of the clinical manifestations and MRI findings of the case. MRI failed to detect bone wax-related granuloma in our case. Careful and meticulous application of bone wax is needed if its use during an operation is a necessity and only as small amounts as possible should be used in a limited area.

REFERENCES

1. Ateş O, Caylı SR, Gürses I: Bone wax can cause foreign body granuloma in the medulla oblongata. *Br J Neurosurg* 18:538-540, 2004
2. Cirak B, Unal O: Iatrogenic quadriplegia and bone wax. *J Neurosurg (Spine 2)* 92:248, 2000
3. Patel RB, Kwartler JA, Hodosh RM: Bone wax as a cause of foreign body granuloma in the cerebellopontine angle. *J Neurosurg* 92:362, 2000
4. Sudmann B, Bang G, Sudmann E: Histologically verified bone wax (beeswax) granuloma after median sternotomy in 17 of 18 autopsy cases. *Pathology* 38:138-141, 2006
5. Verborgt O, Verellen K, Van Thielen F, Deroover M, Verbist L, Borms T: A retroperitoneal tumor as a late complication of the use of bone wax. *Acta Orthop Belg* 66: 389-391, 2000
6. Wolvius EB van der Wal KG: Bone wax as a cause of a foreign body granuloma in a cranial defect: A case report. *Int J Oral Maxillofac Surg* 32: 656-658, 2003