

Retained Surgical Sponge After Hemilaminectomy: Report of Two Cases

Hemilaminektomi Sonrası Unutulmuş Cerrahi Spanç: İki Olgu Sunumu

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Abstract: Lumbar discectomy is the most used operative technique at neurosurgery clinics around the world. The complications of lumbar disc operation include infections, dural tear, bleeding, vascular and intestinal injuries. Infectious complications of lumbar disc surgery are superficial and profound tissue infections, meningitides and epidural abscess.

Although retained surgical sponges are well known intraoperative complications in other surgical branches, they have not been widely reported in neurosurgical literature. In this report we present two cases of retained surgical sponges in the operation sites and discuss them with the pertinent literature.

Key words: Foreign body, hemilaminectomy, intraoperative complications, retained surgical sponge

Özet: Tüm dünyada beyin cerrahi kliniklerinde lomber diskektomi en sık kullanılan cerrahi tekniktir. Lomber disk operasyonu komplikasyonları; infeksiyonları, dural yırtığı, hemorajiyi, vasküler ve intestinal hasarları içerir. Lomber disk cerrahisinin İnfeksiyöz komplikasyonları, yüzeysel ve derin doku infeksiyonları, menenjit ve epidural absedir. Cerrahi sırasında unutulmuş spanç diğer cerrahi branşlarda iyi bilinen intraoperatif komplikasyonlardan olmasına rağmen, nöroşirurji literatüründe nadiren bildirilmiştir. Bu sunuda operasyon sahasında spanç unutulmuş iki olgu, ilgili literatür eşliğinde tartışılmıştır.

Anahtar kelimeler: Hemilaminektomi, intraoperatif komplikasyonlar; unutulmuş cerrahi spanç, Yabancı cisim

INTRODUCTION

Retained surgical sponges after spinal operations have scarcely been reported (2,12,13,15). Ramirez and Thisted reported the number of

incidences of retained surgical sponge as 0.7 per 10,000 patients (12). In the two incidences in our report, a retained surgical sponge was encountered one month after a lumbar disc operation in the first case and a sponge was found two months after the

operation in the second. We discuss these cases with a review of the literature, emphasizing the clinical aspects and the radiological findings.

CASE REPORTS

Case 1

A 45-year-old man presented with complaints of low back and right leg pain, hypoesthesia and weakness. The patient had previously had right hemilaminectomy and discectomy operations for L4-5 herniated disc at another medical center. The patient began to suffer from severe low back pain which radiated down to right leg again on the postoperative fifteenth day. When he was admitted to our department with these complaints, the patient was afebrile and appeared to be in good health on physical examination. There was swelling, pain, and roughness on the incision scar. The area was tender but not erythematous. The straight leg-raising test was negative and he had right L5 hypoesthesia and weakness on dorsoflexion of his right foot. Muscle strength was 2/5 on neurological examination. The weakness

and hypoesthesia were not well evaluated before the operation due to poor cooperation of the patient.

Laboratory tests disclosed WBC as 11900/mm³, erythrocyte sedimentation rate as 30 mm/h, and C-reactive protein as 8 mg/L (normal is <0,5mg/L). Purulent material was found by the lumbar puncture performed through the incision scar. Abundant polymorphous nuclear leukocytes were seen in gram staining but no bacteria could be found. The pus was cultured for aerobic and anaerobic bacteria, but no bacterial growth on cultures was detected. The plain spine x-rays in the presented case showed right L4 hemilaminectomy defects. T1-weighted MRI revealed hypointensity on right L3-S1 paravertebral region (Figure 1a). T2-weighted MRI showed multiloculated hyperintense fluid collections as a sign of paravertebral abscess on right L3-S1 paravertebral region (Figure 1b-c). Contrast enhanced T1-weighted images showed a hyperintense contrast enhancing rim around the hypointense lesion (Figure 1d-e).



Figure 1 a: T1 weighted sagittal images; irregular, isointense mass is seen in the posterior paravertebral region

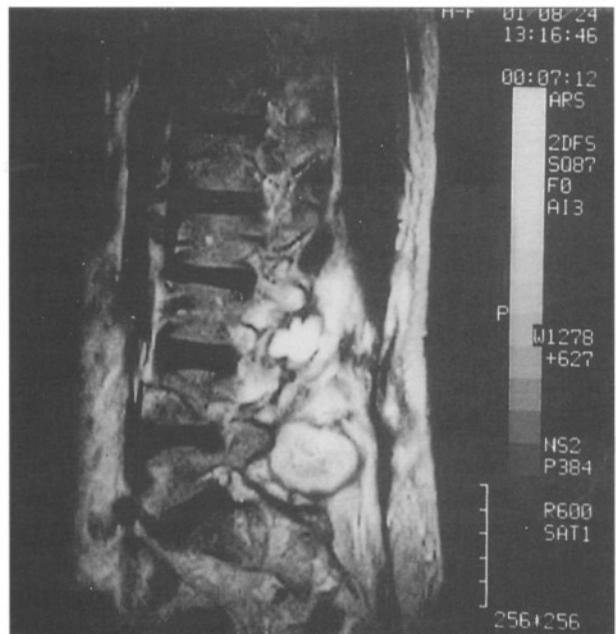


Figure 1 b: Sagittal cross-section of T2 weighted images: heterogenous hyperintense, multilobulated mass is seen in the right posterior paravertebral region

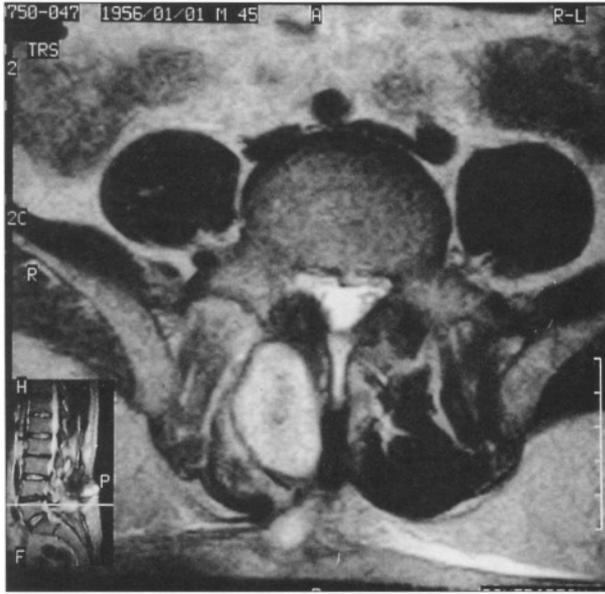


Figure 1-c: Axial cross-section of T2 weighted images; heterogenous, hyperintense, multilobulated mass is seen in the right posterior paravertebral region.

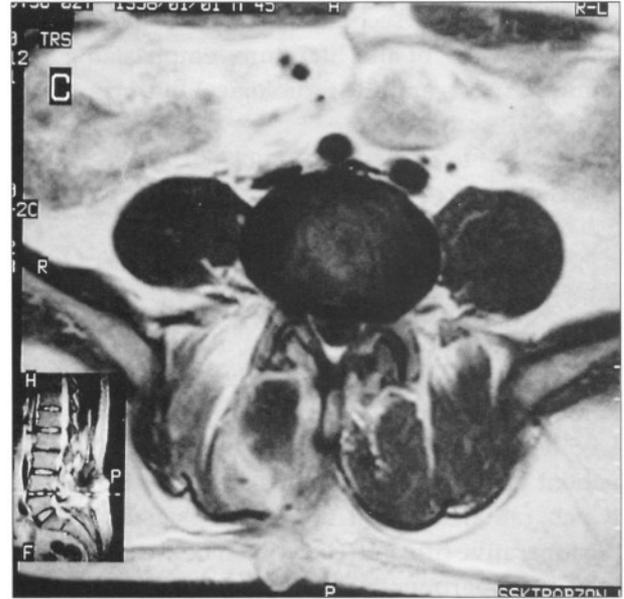


Figure 1-e: The mass lesion which was described on the axial T1 weighted images after gadolinium injection is seen. In addition, heterogenous enhancement of contrast agent can be seen in the soft tissue surrounding the mass.



Figure 1-d: Sagittal cross-section of the mass lesion on T1 weighted images after gadolinium injection is seen.

OPERATION

During the operation, necrotic tissues were removed and the abscess located between the muscles and the epidural space was drained. A bloody, purulent retained sponge was found within the paraspinal abscess cavity. The wound was washed with saline and the layers were closed as usual.

Postoperative Course

Antibiotherapy continued until the postoperative fifth day. The sponge was cultured for aerobic and anaerobic bacteria and no bacterial growth on cultures was found. The laboratory results showed that WBC was $7400/\text{mm}^3$, erythrocyte sedimentation rate and C-reactive protein were 3mm/h and $0,57 \text{ mgr/L}$, respectively, on the postoperative seventh day. He made a smooth recovery and the degree of his muscle weakness on dorsoflexion improved to 4/5. He was discharged free of pain on the seventh postoperative day.

Case 2

A 68-year-old man was admitted with complaints of low back and right leg pain, weakness, and hypoesthesia. The patient had had right hemilaminectomy and discectomy operations for L4-5 herniated disc at another medical center. The patient began to suffer from severe low back pain on the postoperative twenty-first day and could not walk because of the pain for three days. On admission to our department with these complaints, the patient was febrile (38°C). The incision scar was observed to be swollen, tender, erythematous and rough on physical examination. The straight leg-raising test was positive (approximately 40°) and he had right L5 hypoesthesia and weakness on dorsoflexion of his right foot with 3/5 muscle strength.

WBC count was 23500/mm³, erythrocyte sedimentation rate and C-reactive protein were found to be 54 mm/h and 13,2 mgr/L, respectively, on laboratory tests. Purulent material was found by the lumbar puncture performed through the incision scar. Abundant polymorphous nuclear leukocytes were seen in gram staining and gram-positive bacteria were detected. Staphylococcus aureus growth was observed on

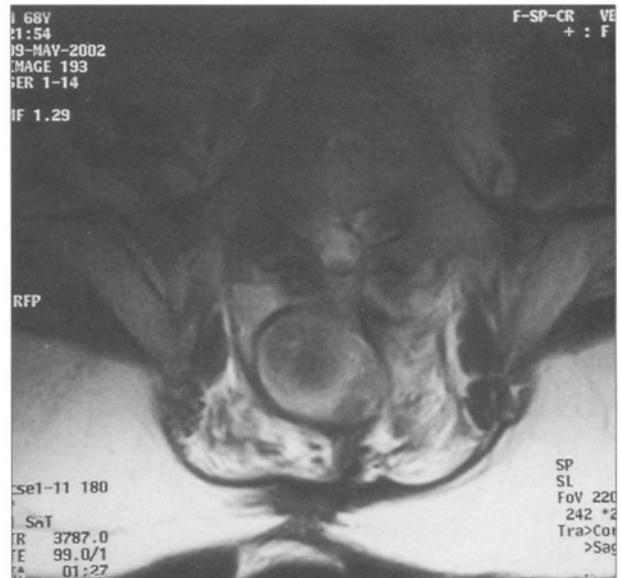


Figure 2b : Axial cross-section of T2-weighted images showing a well circumscribed hyperintense lesion with central hypointensity.

the culture of purulent material. T2-weighted MRI showed a well-circumscribed hyperintense lesion with central hypointensity (Figure 2a-b). After the injection of gadolinium on T1-weighted images, a hyperintense ring around the hypointense lesion was seen (Figure 2c-d).



Figure 2a : Sagittal cross-section of T₂ weighted images showing a well circumscribed hyperintense lesion with central hypointensity.



Figure 2c : Sagittal cross-section of gadolinium enhanced T₁ weighted images, a hyperintense ring around the hypointense lesion is seen



Figure 2d: Axial cross-section after the injection of gadolinium on T₁-weighted images, a hyperintense ring around the hypointense lesion is seen.

OPERATION

During the operation, necrotic tissues were removed and the abscess located between the muscles and the epidural space was drained. A bloody, purulent retained sponge was found in the abscess region. The wound was washed with saline and the layers were closed as usual.

Postoperative Course

Antibiotic therapy continued until the postoperative seventh day. The sponge was cultured for aerobic and anaerobic bacteria, and *Staphylococcus aureus* growth was observed on cultures. The laboratory results showed that WBC count was 5200/mm³, erythrocyte sedimentation rate and C-reactive protein were 12 mm/h and 0,38 mgr/L, respectively, on the postoperative seventh day. The postoperative period was uneventful and the patient was discharged on the seventh postoperative day with full strength.

DISCUSSION

A review of literature about "retained surgical sponge", covering the years between 1965 and

2002, revealed only nine reports pertaining to neurosurgical operations, either cranial (6,14) or spinal (1,2,5,9,12,13,15).

Cotton-based and similar materials are widely used in neurosurgery for subperiosteal muscle dissection and hemostatic control. Cottonoids are more commonly lost than sponges, which is well-known, though not readily reported (9). Being an incidence of medical malpractice, the cases of retained surgical sponges are rarely reported by authors. Ford described two patients with retained cottonoids after lumbar spinal operations (1) and Gifford reported a retained sponge after laminectomy (2). In the cases we report here, the sponges had probably been forgotten during subperiosteal dissection.

Retained surgical sponges may produce serious complications (3,13); abscesses, delayed wound healing, adhesion, erosions into the intestinal tract, and even pathological fractures (5). Stroll reported a granulomatous abscess due to a retained sponge that caused low back pain after 40 years from the time when laminectomy was performed (13).

The risk factors which predispose to infection after lumbar operations include inadequate sterilization of the operation region and surgical instruments, previous cutaneous infection on operation region, peroperative contamination, forgotten foreign bodies (needle, lancet, sponge, cotton pledged), instrumentation, inadequate immune response in patients, corticosteroid usage after operation and pseudomeningocele formation (4,10,11). It seems that the current volume of literature represents an underestimation of the actual incidences of surgically retained foreign body infections (9).

The infections occurring after lumbar disc operations can be classified into two groups as superficial and profound. Superficial infections are generally presented with the inflammation and tenderness on the operation region. Patients usually suffer from pain in the operation region but radicular pain is much rarer than this complaint. Increasing pain with movement and tenderness are symptoms indicating rather a profound infection. Rubor may also be inspected on the operation region (10).

Staphylococcus aureus, Enterococcus, and Peptostreptococcus are the most frequent pathogens in the spinal abscess that occur after spinal surgery (4,11). In our first case, cultures were sterile because the patient had received antibiotherapy since the time of the first admission. However, in the second case, staphylococcus aureus growth was observed on cultures. The patients suffering from spinal abscess have increased leukocyte count. Erythrocyte sedimentation rate and C-reactive protein levels are high and could also be used as follow-up markers.

The paraspinal abscess had no distinguishing features; most of them were hypointense on T₁-weighted images and hyperintense on T₂-weighted images. Rim enhancement around intraosseous and paraspinal soft tissue abscess is more common than in other spinal infections (8). T₁-weighted MR image analyses could not show clearly the characteristic structure of the surgical sponge, but in a reported case T₂-weighted MR imaging showed a folded fabric appearance within the cystic mass (7). The paraspinal abscess in our cases were hypointense on T₁ weighted images and hyperintense on T₂ weighted images but we could not observe the "folded fabric appearance" on T₂ weighted images as Matsuki et al reported.

Early diagnosis, abscess drainage with appropriate intravenous antibiotics and removal of necrotic tissue and retained sponge are important in the treatment of spinal abscess caused by retained surgical sponges. In our patients treated with antibiotics, the symptoms and signs improved soon after drainage of abscess and removal of the sponges.

In the cases of long-lasting wound infections which do not respond to antibiotherapy, the possibility of retained foreign materials such as surgical paddies and sponges should be considered.

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