

# Surgical Sponge Retained in Femoral Canal for 22 Years: A Case Report

Mohammad sajjad Mirhoseini<sup>1</sup>, Salman Azarsina<sup>1</sup>, Mohsen Tavakoli<sup>1</sup>, Omid Kohandel Gargari<sup>1,2,\*</sup>

<sup>1</sup> Assistant Professor, Department of Orthopedics, Shahid Madani Hospital, Alborz University of Medical Sciences, Karaj, Iran

<sup>2</sup> Assistant Professor, Alborz Artificial Intelligence Association, School of Medicine, Alborz University of Medical Sciences, Karaj, Iran

\*Corresponding author: Omid Kohandel Gargari, Alborz Artificial Intelligence Association, School of Medicine, Alborz University of Medical Sciences, Karaj, Iran. Tel: +98-9394104637, Email: kohandelgargar@gmail.com

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## Abstract

**Background:** Retained surgical items (RSIs) are not very common in the orthopedic surgery. Here, we are reporting a case of a sponge pad left in the femoral canal for 22 years. We could not find any other reported case of retained surgical sponge in the femoral canal and that is what makes this case report unique.

**Case Report:** The patient was a 42 year-old man who underwent surgery for the fixation of a fractured femur 22 years ago. On August 2020, this patient was seen complaining about pain at the surgical site. The assessments revealed a sponge pad retained in the femoral canal, which was removed by surgery. The union of fractured bone did not take place in the first surgery, so after 6 months a second surgery was performed and the dynamic compression plate (DCP) placed was successfully replaced with an intramedullary nail.

**Conclusion:** The surgeon could not detect the pad 22 years ago and the patient had no significant symptom all this time. The most important take-away lesson of this paper is that retention of surgical pads could also occur with correct gauze counting, so detection and prevention protocols for RSIs must be taken seriously.

**Keywords:** Retained Surgical Items; Retained Surgical Sponge; Gossypiboma

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## Background

The incidence of retained surgical items (RSIs) is 1.32 in 10,000 in the USA (1). Surgical sponges, because of their ubiquitous use in the operation rooms, are the most common RSIs. They also mimic the surrounding tissues when they are covered in blood and it makes them hard to distinguish. The most common locations for retained sponges are abdomen (56.0%), pelvis (18.0%), and thorax (11.0%) (2). In a study on 319 retained sponge cases, in only 3 of them the sponges were retained in leg or gluteal regions. Lower extremity is not a common location for retained sponges (3).

The retain time ranges from 1 day to 40 years and the complications are highly diverse, from infection to mass effects such as obstruction and also migration of the sponge (2).

There are some preventive strategies to reduce the risk of RSIs such as counting, better communication, and use of radiography to locate the retained item (4).

We could not find any reported case of retained sponge in the femoral canal in the PubMed database.

## Case Report

The patient was a 42 year-old man complaining of pain at the site of a previous surgery on his left thigh (Figure 1).



Figure 1. Long standing healed wound

The surgery had been performed 22 years ago (1999) due to a type IIIB (Gustilo and Anderson classification) open fracture of the femur. After pre-operative care including debridement and soft tissue care, the fracture fixation had been performed by a dynamic compression plate (DCP). Unfortunately, the primary radiographs were not available. The patient was visited on August 2020.

We asked for left femur radiographies (Figure 2) and after the examination of the X-ray images, the first diagnosis that came to mind was a retained sponge pad in the surgical site that might have even been left in the femoral canal. Other differential diagnoses included abscess formation or malignancies.

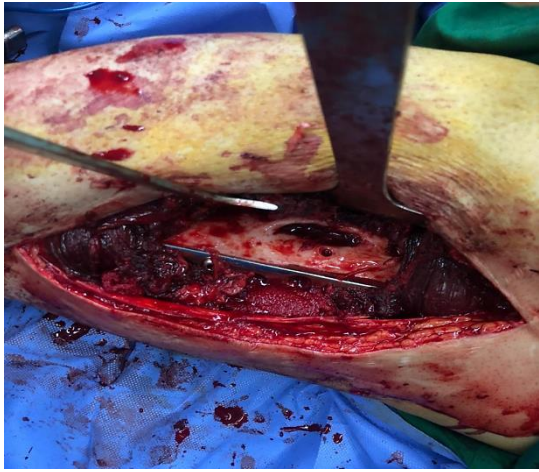


Figure 2. Retained surgical sponge, August 2020

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**Figure 3.** Retained sponge

The patient underwent surgery to remove the sponge by Dr. M.T.; surprisingly, the sponge was not in the soft tissue and it was trapped in the femoral canal (Figures 3 and 4).



**Figure 4.** Removed sponge

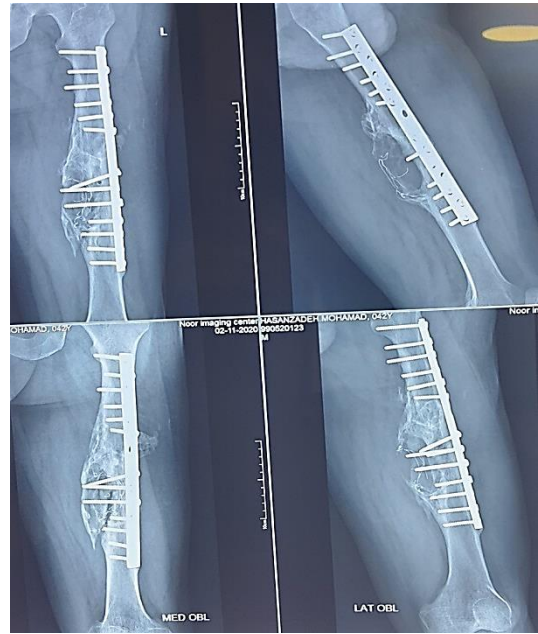
After medial osteotomy of the femur, the pad was removed and the bone was fixed by three screws (Figure 5). The bacterial culture of the pad resulted negative. The patient was then discharged with the recommendation of partial weight bearing.



**Figure 5.** The sponge removed and the bone fixed with three screws

Three months later (on November 2020), the patient returned complaining about pain at the surgical site. We asked for new radiographs and it was revealed

that the surgery was successful and the sponge was completely removed, however no union or callus formation was observed (Figure 6). The white blood cell (WBC), erythrocyte sedimentation rate (ESR), and C-reactive protein (CRP) levels were within the normal range. He was advised to walk by crutches with partial weight bearing and indomethacin was prescribed for him.



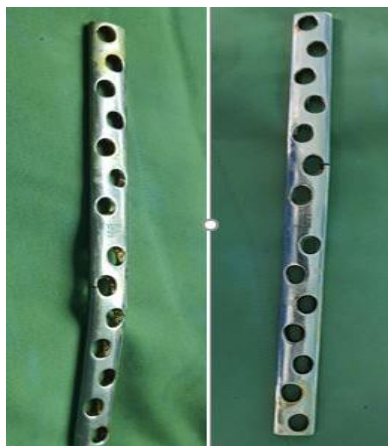
**Figure 6.** Non-union of the fracture; November 2020

Three months later (January 2021), the pain was worsened and the radiographs taken displayed that the plate was bent and broken and it was about to fail (Figure 7).



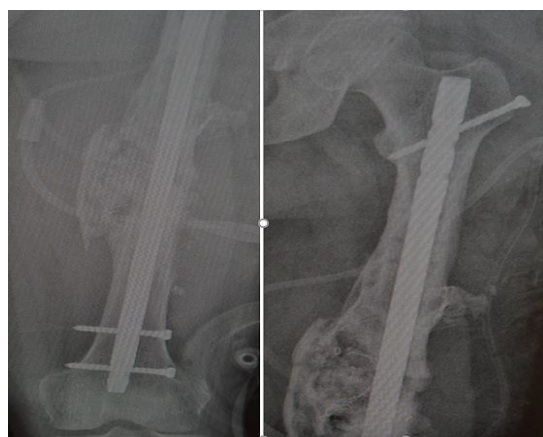
**Figure 7.** Bent dynamic compression plate (DCP) plate; January 2021

The patient underwent surgery for the second time. The bent and broken plate was removed (Figure 8) and the fibrous tissue that was formed because of the non-union was also removed.



**Figure 8.** Broken dynamic compression plate (DCP) plate removed

The proximal and distal ends were refreshed and the fixation by a retrograde nail was performed (Figure 9). The defect was filled with bone substitute and autogenous bone graft.



**Figure 9.** The bent and broken plate removed and replaced with an intramedullary nail

After two months, the patient had full weight bearing without any pain (Figures 10 and 11). The timeline of this patient is displayed in figure 1.



**Figure 10.** Knee full range of motion (ROM) two months after surgery



**Figure 11.** Union after two months

### Discussion

In a study by Hempel et al., the incidence of RSIs was reported to be 1.32 per 10,000 surgical operations in the US. This study also mentioned that the retained sponges are the most common type of RSIs (1). The retain time ranges from 1 day to 40 years (2). They are most commonly discovered within weeks to months (5).

In a study by Steelman et al., the most common locations for the retained sponges were abdomen (52.0%), vagina (23.9%), and chest (8.5%); and only 1.0% was in the leg and gluteal regions (3).

Personnel ignorance of the policies cannot be the only reason of RSIs and other underlying factors play important roles as well (6). The most common risk factors include emergency procedures, unexpected intraoperative events, duration of operation, patient's body mass index (BMI), lack of communication, and incorrect counts (1). However, counting was correct in 80.6% of the procedures with completed counting (6).

Feldman proposed some prevention strategies to prevent retention of surgical items (4):

1. **Counting:** Counting must follow the Association of Perioperative Registered Nurses (AORN) recommendations. However, it is important to remember that the retained sponge cases often occurs when the counting is correct.
2. **Teamwork:** a less stressful environment and giving sufficient time to nurses for correct counting could prevent the RSIs.
3. **Radiography:** X-ray is recommended when there is an unresolved incorrect counting. But radiography is not a reliable technique as only 67% of objects are detectable with X-ray and there is a 10% false negative in the case of retained sponges.
4. **Technologies:** alternative technologies including barcode scanning, radiofrequency detection, and radiofrequency identification could be used to prevent RSIs.

Both complex fractures and open fractures are susceptible to non-union and malunion (7); in this case, we believe that the presence of an external and a low grade infection is the cause of non-union.

Retained surgical pads could also be present in situations in which gauze counting is correct. Items could be retained before operation for example in emergency room. In this case, the most probable cause seems to be the pad pushed to the fracture site to stop bleeding and

missed to remove in pre-operation care. This study suggests that all stages from the moment of injury to the time of discharge be monitored and proper protocols be employed to prevent retained surgical pad.

#### Conclusion

The most important point of this study is the possibility of the pad retention in the presence of correct gauze counting. Symptoms of RSIs are so diverse, and imaging and other diagnosis modalities are not reliable enough to detect RSIs; as you can see in the presented case, the symptoms brought the patient to the hospital 22 years after surgery. Professionalism, high precision, and communication of all the people and systems included in the patients care, inside or outside the operation room, is the key to prevent RSIs.

#### Conflict of Interest

The authors declare no conflict of interest in this study.

#### Acknowledgments

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