



## Unusual cause of refractory infection in head and neck surgery; Retained surgical sponges

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### ARTICLE INFO

### ABSTRACT

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Refractory infections are not common in head and neck region. As gossypiboma (retained surgical sponges) is also rare in head and neck surgeries, it is generally ignored as a potential diagnosis. In this article we aimed to call attention to gossypiboma cases in refractory maxillary infections. We present three cases of retained surgical sponges after head and neck surgery occurred in between 2003 and 2011. We also discussed the possible causes and prevention strategies for them.

#### Keywords:

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### 1. Introduction

Blood supply of head and neck region is very rich and bleeding is common during surgeries. Short incision or if possible intraoral incisions are preferred in this region, illumination of surgical zones are limited and viewing angles are narrow. When intensive bleeding from deeper zones is overlapped, it becomes very

hard to detect the exact point of the bleeding. In this situation sponges (cotton textiles) are generally cluttered to the bleeding area and surgery continues in a different region. Although all surgeons are aware of the importance of removing these sponges. Sometimes they can be forgotten due to combination of multiple risk factors like size of the sponge, massive bleeding

that hides the sponge or decreased attention of the surgeon.

Depending on the settlement position, these foreign bodies can stay asymptomatic for years. But in head and neck region according to small gaps and thin soft tissue coverage, these masses become symptomatic shortly after the surgery. Leak of a bad smelling fluid with fistula formation and antibiotic resistant infection are the major signs. In most of the cases the foreign body is not palpable due to edema that hides the sponge. Although treatment after diagnosis is easy in this region, as retained gauze (gossypiboma) is an unexpected diagnosis, patients usually receive long term antibiotic treatments before radiologic examinations or explorative surgery.

In this article we tried to call attention to gossypibomas in refractory maxillofacial infections. We present three cases of retained surgical sponges after head and neck surgery occurred in between 2003 and 2011. We also reviewed the literature, discussed the possible causes and prevention strategies for them.

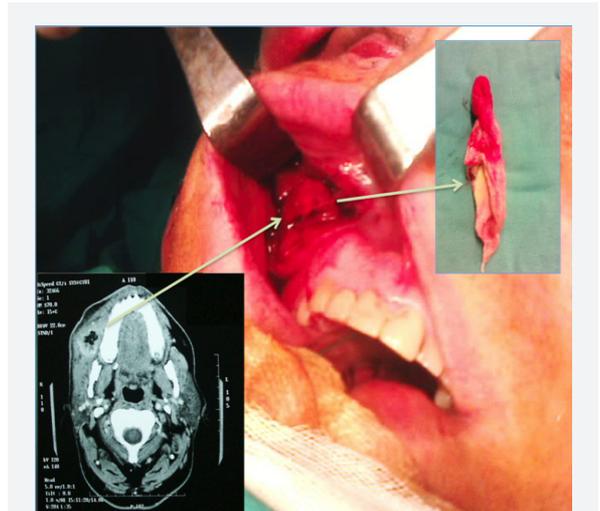
## 2. Case reports

### Case 1

A fiftyfive years old male was operated for right maxilla anterior wall, zygoma and orbital floor fractures in a different center. The reconstruction was done with rigid fixation using titanium implants. One month after surgery he complained about swelling and erythema on his right cheek. A fistula formation was present in right gingivobuccal mucosa. Antibiotic therapy with broad spectrum antibiotic was given for a week. Despite the therapy, clinical findings got worse and a diagnostic computerized tomography (CT) was planned. On CT scans, 3x3 cm abscess formation was found out over right maxillary sinus wall. In explorative surgery an unexpected mass; retained surgical sponge was found out as the cause of infection (Fig.1). Clinical findings recovered after the removal of the sponge.

### Case 2

A nineteen year old male patient underwent Le-Fort 1 osteotomy for maxillary retrusion. Two hours after the recovery a massive bleeding occurred from the gingivobuccal incisions and the patient underwent a second surgery. In the operation exact bleeding zone was not detectable. Therefore small pieces of sponges were cluttered over the bleeding. After hemostasis, the operation ended and he was discharged two days following the second surgery. Two months after the surgery he admitted with swelling on the right cheek and a fluid leakage from right gingivobuccal sulcus with a bad odor. From our previous experience exploration was done under local anesthesia and a small piece of sponge was found over the right buccal fat pad. (Fig. 2) His complaints resolved after the explorative surgery.



**Fig. 1.** 55 years old male with refractory maxillary infection. Computerized tomographyscans yields a 3\*3 cm abscess formation and a small piece of surgical sponge was found out to be the reason of refractory infection on exploration

### Case 3

A sixtyseven years old women underwent left unilateral neck dissection for squamous cell carcinoma on the left upper lip. On the fifteenth day of operation a firm mass was palpated over the left sternocleidomastoid (SCM) muscle with a fistula formation over the area (Fig. 3). Exploration yielded a surgical sponge settled lateral to SCM muscle under the lateral skin flap (Fig. 3). Fistula healed after the removal of the foreign body.



**Fig. 2.** 19 years old male patient with retained surgical sponge after LeFort-1 osteotomy advancement surgery

### 3. Discussion

The importance of retained surgical instruments was first published by Wilson in 1884. Since then over 160 articles and 300 cases were published related with retained surgical instruments (Wan et al., 2009). Estimated risk for retained surgical instrument is one in 5500 surgeries (Cima et al., 2008). Retained surgical sponge (gossypiboma); is the most common material (69%) forgotten in surgical areas (Gawande et al., 2003).



**Fig. 3.** 66 years old female patient with retained surgical sponge after left unilateral neck dissection done for the treatment of squamous cell carcinoma of the lower lip

Gossypiboma is more common in abdominal, pelvic and thoracic surgeries. The percentage of gossypibomas in head and neck region covers only 4% of all cases (Wan et al., 2009). Most of these cases are intracranial textilomas or muslinomas that forms secondary to vascular wrapping of muslin material in aneurysm surgery (Prabhu et al., 1994; Berger et al., 2003) Other reported rare gossypiboma cases of head and neck region are related to mandible contouring surgery (Song et al., 2009), submandibular gland excision (Amr, 2009), adenoidectomy (Ozer et al., 2007) and endoscopic sinus surgery (Tan and Sethi, 2011). Gossypibomas related to maxilla surgery and neck dissection are very rare and commonly is not assumed as a possible diagnosis.

Surgical sponges are fibrous, absorbable materials composed of sterile cotton or synthetic fabrics. As their size decreases and they are covered with blood, they resemble normal tissues and it becomes harder to distinguish them (Yıldırım et al., 2006; Dossett et al., 2008; Wan et al., 2009). In the literature average time of diagnosis for retained surgical sponges is six to nine months and only 37% of cases were diagnosed in the first year. But in craniofacial surgery diagnosis is possible in a few months because of small gaps and

reliably thinner soft tissue coverage over the sponges compared to abdomen and thorax. In all cases retained sponges were diagnosed within two months after the primary surgery.

Before the gossypiboma diagnosis first we must suspect about retained surgical sponge. Swelling and erythema are the most common symptoms. In all our three cases a fistula was formed from the incision site and a fluid leak with a bad odor was present. Palpable mass was only present in the third case, possibly because of the thin soft tissue coverage over the neck. Computerized tomography was only applied in the first case. In the other two cases clinical evaluations were sufficient to decide exploration of the surgical area. Retaining a surgical material inside the patient is a shame for the surgeon. When we also consider the legal issues prevention of this situation has a great importance. In 2003 Gawande et al. investigated many factors as a potential risk factors for retained surgical materials. These factors were; age, sex and body mass index of the patients, absence of sponge count, operation time, estimated blood loss during operation, emergency operations, unexpected changes in the operation, more than one surgical team in the operation, more than one major operation in a single session, change in nursing staff and absence of primary surgeon on skin closure. He found out that only emergency procedures and unexpected changes in the operation caused statistically significant changes. In this study it has been shown that, the risk of retained surgical sponges increases by nine times in emergency procedures. Also it has been mentioned that the risk even increases four times more when an unexpected condition like excessive bleeding occurs during the surgery.

When we examine our cases, we cannot comment on the first case because the operation was done in a different center. But the sponge piece cluttered over the right buccal mucosa was too small which may be the potential risk factor. Second case was an surgical emergency and sponges were cluttered on the hemorrhage area because exact bleeding source was not found. So possibly a small piece of sponge was left behind over the right buccal fat pad. On the third cases the primary surgeon was not present at closure and sponges were left behind.

Although no risk factors can explain retaining a surgical instrument in surgical area, some factors can ease the potential risks. These factors are thought to be; deep and dark surgical areas with limited incisions, emergency procedures, unexpected changes during surgery like intensive bleeding, operation duration (surgeon exhaustion), change in surgeon or nursing team, use of small sponge pieces for cluttering, using non-visible sponges on x-ray and ignoring sponge count especially in maxillofacial surgeries. Potential risk factors were summarized in Table 1.

**Table 1.** Potential risk factors for retained surgical sponges in craniofacial surgery

Dark and deep surgical zones
Emergency procedures
Unexpected conditions during surgery like massive bleeding
Time and duration of surgery (surgeon exhaustion)
Change in surgeon or nursing team
Using small pieces of sponges for cluttering
Using non-visible sponges on x-ray
Ignoring sponge count

Some measures can be taken to prevent this uneventful situation. In abdominal or thoracic surgeries sponge counts alone or with radiologic analysis is recommended in all cases (Rappaport and Haynes, 1990; Gawande et al., 2003; Lincourt et al., 2007). But sponge count or radiography is not routinely done in craniofacial surgery. Maybe rather than sponge count noting the cluttered sponges and its location can be noted by helping staff and these notes can be reminded to surgeon before skin closure. Second precaution should be using big sponge pieces for cluttering and suspending one edge of the sponge outside the incision.

Also using radiopaque sponges will increase detection rates when there is suspicion. Exhausted surgeons will be more likely to lose their attention and concentration during surgery. With less attention potential risk of retaining the cluttered sponge in surgical

area should increase. So if possible, exhausted surgeons should delay surgical procedures or let a secondary surgeon to enter the operation. For better visualization of the surgical area the incision must be big enough to see the whole area. Light can be increased by wearing a head light. Prevention of bleeding as much as possible will decrease the necessity of sponge clutters. Before skin closure primary surgeon must control the surgical area. Preventive measures are summarize in table 2.

**Table 2.** Measures for prevention of retained surgical sponges in craniofacial surgery

The number and place of sponges can be noted by helping staff
Using big and radiopaque sponges will increase detection rates
For a better visualization; incision must be big enough and light can be increased by a head light
Surgeon exhaustion should be prevented (Less mistakes)
Change in surgeon or nursing team
Excessive bleeding should be prevented (Less need to sponge clutters)
Primary surgeon must check the surgical area before closure

In conclusion, retained surgical sponge is an uneventful situation for all surgeons. When we consider no surgeon makes this mistake twice (Gawande et al., 2003), every surgeon should understand the potential risks of retained surgical sponges and must take basic precautions for the prevention of it.

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