

A Case Report on Gossypiboma: A Glitch in Safe Surgical Practice

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Learning Point of the Article:

- Gossypiboma is a preventable surgical event that has adverse consequences on patient health
- It has legal implications on the hospital and may disrepute the surgeon
- Strict practice of the WHO Surgical safety checklist plays a vital role in prevention
- In cases presenting with early Surgical Site Infection: Retained gauze in the surgical field should be considered as a cause and rectified for faster recovery.

Abstract

Introduction: Inadvertent retention of surgical cotton gauze or cotton material in the surgical field is described as Gossypiboma. It is a rare event in orthopedic surgery, and hence the diagnosis is obscured in the setting of early surgical site infection (SSI) and is often initially mistaken with breach in the aseptic technique, improper autoclaved instruments, long duration of surgery, poor surgical environment, or decreased immunity of the patient.

Case Report: We present a case of SSI of the hip with impending sepsis in an elderly female with a missed diagnosis of retained cotton mop at the surgical site. Thorough evaluation of the post-operative radiographs helped arrive at the diagnosis. Debridement, removal of the mop, and antibiotic coverage, with watchful post-operative progress, were vital in healing of the wound.

Conclusion: Gossypiboma is a preventable surgical error. The aim of this study is to emphasize the importance of the surgical safety checklist, which largely contributes to safe patient care. Retained gauze piece must be considered in the evaluation of early SSI at the outset to prevent devastating consequences.

Keywords: Gossypiboma, surgical site infection, surgical safety checklist.

Introduction

Accidentally retained surgical swabs/gauze piece or mops in the surgical field are a rare event in the present world. The rarity may be attributed to the diligent implementation of the World Health Organization (WHO) surgical safety checklist and/or underreporting of such cases [1]. Gossypiboma and textiloma are the technical terms used to describe this surgical complication [2]. This type of operative complication is more

frequently seen in surgeries exposing large operative fields, such as abdominal and thoracic surgeries [3]. In Orthopedics, the most common sites are the hip and spine. Diagnosis of Gossypiboma is usually obscured in the majority of cases, as they remain asymptomatic for many years. In symptomatic cases, it is revealed as the occurrence of surgical site infection (SSI) secondary to a foreign body [4]. The diagnosis is mostly made by plain radiographs, computed tomography, and by ultrasound

Author's Photo Gallery



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Figure 1: Open surgical site wound on the lateral aspect of the right thigh with infected granulation tissue.

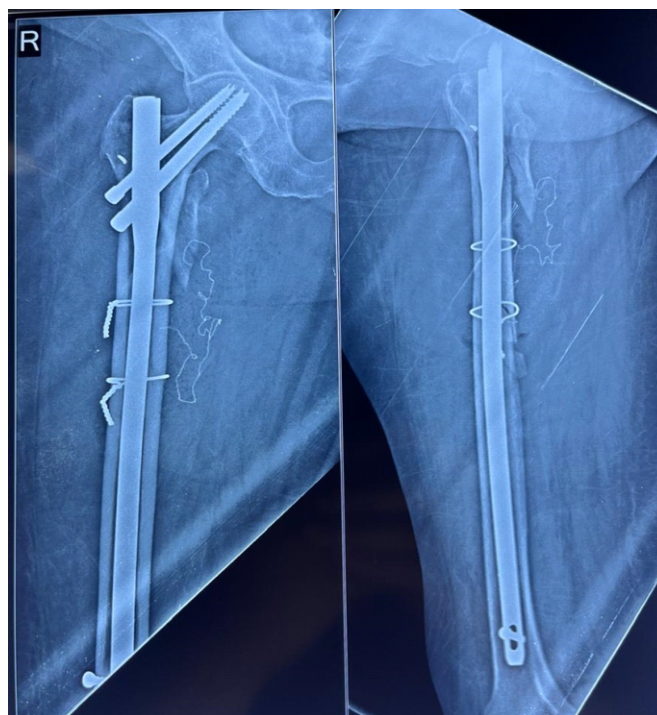


Figure 2: Post-operative plain radiograph showing tortuous X-ray detectable thread-like material medial to the proximal femur.

Case Report

[5]. Thorough debridement, mop removal, and antibiotic coverage are key to complete recovery.

Gossypiboma is largely preventable. In this report, the importance of the surgical safety checklist for prevention and vigilant evaluation of post-operative radiographs for early diagnosis are highlighted.

A 78-year-old female underwent surgery for an intertrochanteric fracture of the right femur for which internal fixation with a Proximal Femoral Nail was performed in a peripheral hospital. Review of operative notes stated that intra-operatively, there was an iatrogenic femur shaft oblique fracture treated with two stainless steel (SS) wire cerclages. Blood loss

Table 1: Inflammatory and nutrition parameters

Parameter	Pre-operative	Post-operative						
		Day1	Day3	Day7	Day14	1 month	3 months	6 months
Hb (g/dL)	9.8	7.6*	9.4*	10.2	10	10	9.8	9.7
TLC cells/Cumm	9800	8600	9100	9200	8000	8800	8500	7200
ESR mm/1 st h	110	98	46	22	20	20	20	18
CRP	76.5	35.7	12.1	6	5.2	4.9	2.3	<1
Total proteins g/dL	2.9	-	3	-	3.2	3.3	-	4.8
Drain (mL)	-	200	140	30 [#]	-	-	-	-

***One unit packed red cells was transfused, [#]Drain was removed. CRP: C-reactive protein, ESR: Erythrocyte sedimentation rate, TLC: Total leucocyte count, Hb: Hemoglobin**





Figure 3: Radiograph showing stimulan beads filled in the void after mop removal.

was approximately 1800 mL. On the 7th post-operative day, there was pus discharge from the middle surgical incision site. The proximal entry incision and the distal locking screw site incision were normal. The infected wound was debrided and left open. Intravenous (IV) antibiotic coverage was given. Patient presented to our institute 3 weeks later with the pouring pus open wound.



Figure 4: Well-healed surgical site at 1-year follow-up.

The diagnosis of deep SSI was made. Wound examination showed infected granulation tissue (Fig. 1). The SS wire cerclage could be felt through the wound. Pus was sent for microbial culture and sensitivity. Patient was anemic (Hemoglobin – 7.1 g/dL), poorly nourished (Total proteins – 4.1, Serum albumin – 1.9), and hypertensive on medication. Her White blood cell counts were high normal; Erythrocyte sedimentation rate was high; and C-reactive protein level was elevated.

Pus culture from her previous hospital reports showed growth of *Escherichia coli* sensitive to Amikacin and Tigecycline. Plain radiograph of the thigh showed a tortuous, crumpled X-ray detectable thread, which was suggestive of abdominal mop (Fig. 2). In the setting of immediate post-operative SSI and the X-ray finding, the diagnosis of retained mop/Gossypiboma was made. After optimization of her physiological parameters, the wound was debrided under anesthesia. The mop was removed. A thorough wound wash was given. The dead space and the surgical site were then filled with Stimulan (absorbable calcium sulfate antibiotic carrier) mixed with Vancomycin and Amikacin (Fig. 3). The wound was closed under a deep and a superficial suction drain.

Outcome

Intra-operative pus culture showed *E. coli* sensitive to Amikacin and Meropenem. Accordingly, IV antibiotics were started. A high-protein diet was started. The drain output on post-operative day 1 was 200 mL, which gradually decreased over a week. Drain was removed on post-operative day 7. Daily wound inspection was found to be dry and healthy. No evidence of re-infection was seen. Inflammatory markers done every 3rd day showed a decreasing trend (Table 1). Patient was afebrile. She was ambulated with partial toe-touch. IV antibiotics were continued for 2 weeks and then oral antibiotics were given for 4 weeks.

Follow-up

Sutures were removed on post-operative day 15. Regular follow-up at 4 weeks, 2, 3, 6, and 12 months did not show any clinical, biochemical, or radiological signs of infection (Fig. 4 and 5).

Discussion

Inadvertent retention of surgical cotton gauze or cotton material in the surgical field is described as Gossypiboma [1]. It is a rare event in orthopedic surgery and hence the diagnosis is obscured in the setting of early SSI and is often initially attributed to breach in the aseptic

Table 2: Review of previously reported cases of Gossypiboma in the thigh after orthopedic surgery

Study	Surgery performed before Gossypiboma	Clinical presentation	Diagnostic evaluation
Arora and Johal [11]	Revision plating of the right femur non-union, 2 years ago	Painless swelling in mid thigh	X-ray Diagnosis was made intraoperatively
Malot and Meena [12]	Malunited femur fracture operated with K nail, 13 years back	Painless mass confused for a Soft Tissue Sarcoma	X-ray, USG Diagnosis was made after dissection of the excisional biopsy specimen
Biswas R S(2012) [6]	Debridement and external fixation for an open fracture of femur shaft 46 years back	Painless mass (chronic infection, tumor)	X-ray, MRI Diagnosed intraoperatively as gauze enveloped by a pseudo capsule
Suh <i>et al.</i> (2009) [13]	ORIF performed for intertrochanteric fracture of the femur, 16 years back	Pathological fracture of the femur (tumor)	X-ray, USG, MRI Diagnosed intraoperatively as decomposed surgical gauze
Pina <i>et al.</i> [10]	Total hip arthroplasty, 15 years ago	Periprosthetic infection	X-ray, MRI Diagnosed intraoperatively as well circumscribed soft tissue mass with gauze fibres
Sadeghifar and Saeed [14]	Femur fracture: IM nail 35 years ago	Delayed infected fistula	X-ray Diagnosed preoperatively, debridement and gauze removal done
Our case	Open reduction of iatrogenic fracture of femur shaft during fixation of intertrochanteric	Surgical site infection	X-ray Diagnosed pre-operatively and mop removal was done

MRI: Magnetic resonance imaging, USG: Ultrasound, IM: Intramedullary, ORIF: Open reduction and internal fixation

assessed. The rarity of Gossypiboma in Orthopedic Surgery makes a low index of suspicion in cases of early SSI leading to persistent infection.

Gossypiboma can present in two ways: The aseptic fibrous type, which remains asymptomatic and is detected accidentally during the evaluation of an unrelated symptom, and the exudative type, which is characterized by abscess formation and early presentation [10]. Aseptic type, being a commoner type has been documented in literature [10, 11, 12, 13, 14]. A review is presented in the tabulated form, which shows the modes of presentation, diagnostic modalities, and management (Table 2). In our case, the presentation was clearly an exudative type with persistent pus discharge. The infection, however, was confined to the local site with no systemic complication.

Gossypiboma can have serious ethical and medicolegal implications. It is considered as a medical negligence and the whole team, which includes the surgeons, the anesthetist team, nurses, and support staff, should feel responsible for not adhering to

technique, improper autoclaved instruments, long duration of surgery, poor surgical environment, or decreased immunity of the patient.

Gossypiboma is an unwanted surgical complication that not only has deleterious effects on the health of the patient but also brings disrepute to the surgeon and the hospital [6]. Although the National Quality Forum of the United States of America and the patient safety guidelines issued by the Health Department of the United Kingdom have declared that the presence of a retained surgical sponge to be a “never event” and should be avoided at all cost, it is not completely eliminated [7, 8]. Several risk factors are associated with Gossypiboma, such as obesity, intraoperative surgical protocol modification, emergency surgery, severe blood loss, long duration of surgery, and non-counting of swabs during surgery [9]. In our case, factors, such as high-volume blood loss and long duration of surgery were present. After analysis of initial surgery notes, it was hypothesized that mops would have been placed to achieve hemostasis while the iatrogenic shaft fracture was being fixed and the post-operative radiographs were not thoroughly



Figure 5: Radiologically healed fracture with no signs of infection at 1 year follow-up.

standard operative guidelines [15]. Hence, all attempts must be made to avoid the consequences of this surgical complication. Proper pre-operative planning, intra-operative alertness, and post-operative inspection before closure of the wound can be immensely helpful in prevention. Strict compliance to the WHO Surgical safety checklist is a simple and effective way to avoid complications. Despite all measures, this event may still occur. Every hospital/Institute should develop patient safety guidelines in operation theatres to completely eliminate this preventable complication.

Conclusion

Gossypiboma is a preventable surgical event that has adverse

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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Clinical Message

Retained gauze after surgery is a preventable complication and may be asymptomatic for a very long period, but can become a complication post-operatively at any time. Hence, if diagnosed immediately after the surgery or at any other time, the gauze should be removed.

Conflict of Interest: Nil

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