

# Retained Surgical Items in Inguinal Canal: A Case Report and Literature Review

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## Abstract

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**BACKGROUND:** Retained surgical items (RSI) are rare medical challenges with serious complications and medicolegal implications. Knowledge and preventive measures for these rare events are currently not sufficient to limit their increasing incidence. Gauzes and sponges constitute most of RSI. Forceps, needles and pins may be found too. Diagnosis of these events is challenging and often missed due to nonspecific clinical findings.

**PRESENTATION OF CASE:** We present here a 49-year-old patient who presented to the clinic with a history of chronic scrotal sinus on the same side of a repeatedly repaired inguinal hernia 4 months before admission. He underwent exploration of the inguinal canal as elective surgery. Exploration of the inguinal canal revealed missed surgical gauze left during the previous hernia repair. The gauze was removed, and the inguinal canal was repaired. The postoperative period was uncomplicated.

**CONCLUSION:** Retained surgical items are completely preventable near-events. Although they are rare entities, clinicians must have a high index of suspicion for any postoperative, in patients presenting with pain, sinus or palpable masses.

## Introduction

Retained surgical items (RSI) are a medical challenge, not only because of the severe complications and morbidity they can cause but also because of their serious medicolegal implications. RSI is grossly underreported by surgeons, although they are reportable events. This is because of a surgeon's fear of legal issues or unwillingness to denounce an error [1]. The average costs to repair and remove RSI can range anywhere from 60000\$ per hospital stay to millions of dollars after settle malpractice claims [2] [3]. It's estimated that the incidence of retained foreign bodies is 0.3 to 1 per 1000 abdominal operation, and 1 in 8000 to 18000 of all inpatient operations, that's one or more cases per year in a big hospital [4]. The commonest RSI are surgical sponges and gauzes (termed "Gossypiboma"), but also needles, scissors, forceps and other objects were reported in the literature [1], [5]. Retained instruments that are kept under aseptic conditions with minimal reaction can be retained for years before they produce significant

symptoms and reactions that lead to their discovery [6], [7]. There're principally 2 main types of reaction that cause complications in those patients; an aseptic fibrins response that results in adhesions, pseudotumor effect, intestinal obstruction and granulomas. Another type is an exudative response giving rise to an abscess formation that will result in peritonitis, fistula formation abdominal mass and gut perforation [1], [6] [8]. It's evident that to decrease the incidence of RSI, the focus should be directed towards 3 major issues, locating missing items after the incorrect count, improving team compliance and attentiveness, and reducing the risk of false-correct surgical counts [4].

In this prospective, single Centre, case report study, we present an interesting case of a retained surgical item in the inguinal canal. The case was managed in Al Bashir teaching hospital in Amman, Jordan in 2010. The patient was followed up in the same hospital.

## Case Presentation

A 49-year old male patient presented to the ER with signs and symptoms of intestinal obstruction. The patient has a previous history of an open-heart surgery 4 years before admission, chronic renal failure on dialysis 2 years ago, and a right inguinal hernia that was repaired 13 years ago, recurred one year before the presentation and was repaired again. Six months after the last inguinal repair, an inguinal sinus discharge was noted on the right inguinal region.

Examination showed a stable patient with normal vital signs. Two sinuses in the right scrotum were noted, and a mesh-related sinus infection at the surgical site was suspected. Lab workout showed a normal WBC count ( $6.3 \times 10^3/\text{mm}^3$ ), elevated serum creatinine ( $718 \mu\text{mol/L}$ ), elevated BUN ( $14.6 \text{ mmol/L}$ ) and mild anaemia ( $11.2 \text{ g/DL}$ ). Other labs were within normal. CT scan with contrast wasn't performed due to elevated BUN and creatinine in this patient (Figure 1).

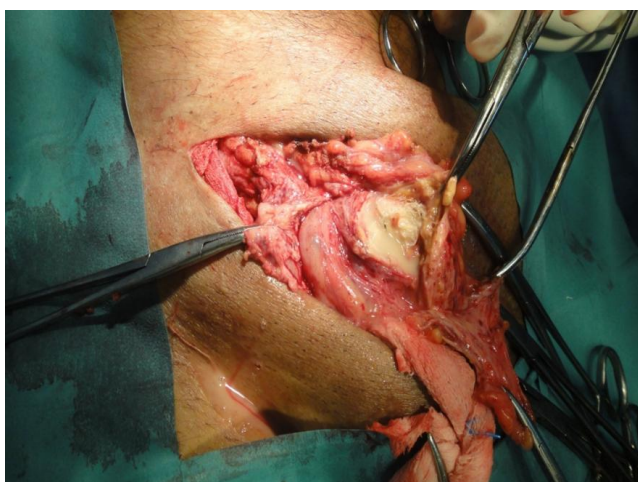


Figure 1: Open herniotomy reveals retained gauze with signs of inflammation and infection

Consent was obtained, and emergent exploration of the inguinal canal was done. Surgery confirmed the presence of a surgical gauze from a previous repair that was removed successfully (Figure 2). Postoperative period was smooth. The patient did well during follow up for one year.

## Discussion

Retained surgical items -although highly underreported- is a dangerous medical error that carries significant morbidity and mortality, and therefore must be tackled seriously. Surgical gauze (Gossypiboma) constitutes most of the retained items due to its small size and amorphous structure, as in

our first case. When soaked with blood, gauzes lose their original shape and colour and become unrecognisable in the surgical field and hard to find. [10]. Most Gossypiboma incidents happened in abdominal and pelvic surgeries [2], as in our case, where deepness of the region and folds of viscus can hide blood-soaked gauzes and make them harder to find. Other cavities include the vagina and the thorax among other places [11]. Other retained items include artery forceps, irrigation sets, rubber tubes and pieces of broken instruments [12].



Figure 2: Removal of gauze during open herniotomy

Age and sex of the patient were not significantly related to the risk of retaining surgical items. Factors that appear to increase the risk of RSI significantly includes longer surgery durations, emergency surgeries, intraoperative complications and unexpected events [4], [11]. A recent meta-analysis study was done by Susan et al., (2014) [13] showed that additional surgical events increase the risk of RSI including incorrect/not performed the surgical count, intraoperative blood loss  $> 500$  and more than one surgical team involved in the procedure. These events were found to increase the risk of miscommunication among different teams and error during safety checks of the patient. There were mixed opinions regarding the role of BMI of the patient [2], [11], [14], [15], [16]. However, the most recent meta-analysis studies concluded a significant direct relationship between the risk of RSI and BMI of patients. [3] In our case, we couldn't retrieve the history of the previous operations which were done in other hospitals. Moreover, our patient had normal BMI (below 30).

Presentation of retained surgical items can range from day of surgery to 28 years later, with a median date of detection at 21<sup>st</sup> day after surgery [11]. In our case, the patient presented after 1 year from the original operation. A study was done by Stawicki (2009) [6] revealed that the most common presenting complaints include abdominal pain (25.8%), abscess (21.2%), Nausea and vomiting (15.2%), wound

complication (15.2%) and masses (12.1%). In our case, the patient presented with persistent abdominal pain, intestinal obstruction, nausea and vomiting.

Diagnosis of RTI is difficult because of low clinical suspicion and since most surgical gauzes are radiolucent on imaging [10]. Previous literature emphasised the importance of using a CT scan with IV contrast for diagnosis of retained surgical items [7] [17]. This modality should be done routinely for patients with intestinal obstruction and surgeons must put RSI on their differential list in a patient with a history of previous operations. In our case, the patient didn't undergo CT scan with IV contrast due to his elevated BUN and creatinine. G Nasir (2008) [18] suggested the use of gauzes and packs that's marked by radiopaque lines to detect missing instruments. A similar study was done by Fabian (2004) [19] experimented the use of electronic tagging of surgical sponges to prevent their retention. The results showed 100% accuracy with no false positives at all. This implies the efficacy of alternative options to solve the problem of invisibility of surgical gauzes on radio imaging.

In conclusion, retained surgical items continue to be a significant challenge for surgeons due to the serious complications if they are discovered late. Those preventable mistakes place a big burden on the health system financially and logistically. However, with good teamwork and an accurate modern counting system, these can easily be prevented. Surgeons must have a high index of suspicion and retained surgical items should be in the differential diagnosis of any postoperative patient who presents with pain, infection, or palpable masses.

## References

1. Ugochukwu AI, Edeh AJ. Retained intra-abdominal artery forceps—An unusual cause of intestinal strangulation. *North American journal of medical sciences*. 2011; 3(7):339. <https://doi.org/10.4297/najms.2011.3339> PMID:22540110 PMID:PMC3336885
2. Elsharydah A, Warmack KO, Minhajuddin A, Moffatt-Bruce SD. Retained surgical items after abdominal and pelvic surgery: Incidence, trend and predictors-observational study. *Annals of medicine and surgery*. 2016; 12:60-4. <https://doi.org/10.1016/j.amsu.2016.11.006> PMID:27895909 PMID:PMC5121141
3. Hempel S, Maggard-Gibbons M, Nguyen DK, Dawes AJ, Miake-Lye I, Beroes JM, Booth MJ, Miles JN, Shanman R, Shekelle PG. Wrong-site surgery, retained surgical items, and surgical fires: a systematic review of surgical never events. *JAMA surgery*. 2015; 150(8):796-805. <https://doi.org/10.1001/jamasurg.2015.0301> PMID:26061125
4. Stawicki SP, Moffatt-Bruce SD, Ahmed HM, Anderson III HL, Balija TM, Bernescu I, Chan L, Chowayou L, Cipolla J, Coyle SM, Gracias VH. Retained surgical items: a problem yet to be solved. *Journal of the American College of Surgeons*. 2013; 216(1):15-22. <https://doi.org/10.1016/j.jamcollsurg.2012.08.026> PMID:23041050
5. Oluwole O, Akinnagbe AM, Nwana EJ, Ogolekuw I, Yilkudi M. Gossypiboma: a cause of iatrogenic fecal entero-cutaneous fistula. *Journal of Medicine in the Tropics*. 2015; 17(1):34. <https://doi.org/10.4103/2276-7096.148694>
6. Stawicki SP, Evans DC, Cipolla J, Seamon MJ, Lukaszczyk JJ, Prosciak MP, Torigian DA, Doraiswamy VA, Yazzie NP, Gunter Jr OL, Steinberg SM. Retained surgical foreign bodies: a comprehensive review of risks and preventive strategies. *Scandinavian Journal of Surgery*. 2009; 98(1):8-17. <https://doi.org/10.1177/145749690909800103> PMID:19447736
7. Suwatanapongched T, Boonkasem S, Sathianpitayakul E, Leelachaikul P. Intrathoracic gossypiboma: radiographic and CT findings. *The British journal of radiology*. 2005; 78(933):851-3. <https://doi.org/10.1259/bjr/61657645> PMID:16110111
8. Asuquo ME, Ogbu N, Udosen J, Ekpo R, Agbor C, Ozinko M, Emelike K. Acute abdomen from gossypiboma: A case series and review of literature. *Nigerian Journal of Surgical Research*. 2006; 8(3-4). <https://doi.org/10.4314/njsr.v8i3-4.54901>
9. Agha RA, Fowler AJ, Rammohan S, Barai I, Orgill DP and the PROCESS Group. The PROCESS Statement: Preferred Reporting of Case Series in Surgery. *International Journal of Surgery* 2016; 36(Pt A):319-323.
10. Chana-Rodríguez F, Ma-anes RP, Rojo-Manaute J, Moran-Blanco LM, Vaquero-Martín J. Suppl 1: M7: Retained Sponge: A Rare Complication in Acetabular Osteosynthesis. *The open orthopaedics journal*. 2015; 9:321. <https://doi.org/10.2174/1874325001509010321> PMID:26312116 PMID:PMC4541466
11. Gawande AA, Studdert DM, Orav EJ, Brennan TA, Zinner MJ. Risk factors for retained instruments and sponges after surgery. *New England Journal of Medicine*. 2003; 348(3):229-35. <https://doi.org/10.1056/NEJMsa021721> PMID:12529464
12. Yorke J, Agbeko E, Amoah G, Abantanga FA. Case Report: Intestinal Obstruction Secondary to an Intra-Abdominal Foreign Body. *Journal of Medical and Biomedical Sciences*. 2013; 2(4):1-5. <https://doi.org/10.4314/jmbs.v2i4.1>
13. Moffatt-Bruce SD, Cook CH, Steinberg SM, Stawicki SP. Risk factors for retained surgical items: a meta-analysis and proposed risk stratification system. *Journal of surgical research*. 2014; 190(2):429-36. <https://doi.org/10.1016/j.jss.2014.05.044> PMID:24953990
14. Stawicki SP, Cook CH, Anderson III HL, Chowayou L, Cipolla J, Ahmed HM, Coyle SM, Gracias VH, Evans DC, Marchigiani R, Adams RC. Natural history of retained surgical items supports the need for team training, early recognition, and prompt retrieval. *The American Journal of Surgery*. 2014; 208(1):65-72. <https://doi.org/10.1016/j.amisurg.2013.09.029> PMID:24524864
15. Freitas PS, Silveira RC, Clark AM, Galvão CM. Surgical count process for prevention of retained surgical items: an integrative review. *Journal of clinical nursing*. 2016; 25(13-14):1835-47. <https://doi.org/10.1111/jocn.13216> PMID:27104785
16. Firstenberg MS, Stawicki SP. *Vignettes in Patient Safety-Volume 2*, 2018.
17. O'Connor AR, Coakley FV, Meng MV, Eberhardt S. Imaging of retained surgical sponges in the abdomen and pelvis. *American journal of roentgenology*. 2003; 180(2):481-9. <https://doi.org/10.2214/ajr.180.2.1800481> PMID:12540456
18. Nasir G. Missed instrument and surgical sponge (gauze and pack). *Int J Surg*. 2008; 20(1):14-20.
19. Fabian CE. Electronic tagging of surgical sponges to prevent their accidental retention. *Surgery*. 2005; 137(3):298-301. <https://doi.org/10.1016/j.surg.2004.10.003> PMID:15746781