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A Case Study on Gossypiboma: Identifying a Hidden Surgical Adversary

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Abstract

Gossypiboma is a rare but dangerous surgical complication that can be explained as a retained foreign body mass of cotton (sponge, abdominal mop or gauze) within the body following a surgical treatment. According to estimates, retained surgical items occur in 1 in 5500 to 1 in 18,000 surgical procedures, making them a rare complication. Owing to its serious medicolegal implications it remains underreported leading to a blurred clinical spectrum. This fact is also depicted in our case which presents an array of nonspecific symptoms painting a picture of possible malignancy.

Wilson documented the first retained foreign body following a laparotomy in 1884. The case study focuses on a young fertile woman who had subtotal hysterectomy with bilateral internal iliac ligation in a tertiary care hospital. Following the procedure, she experienced acute abdominal pain because of a retained abdominal mop. The abdominal mop moved transmurally and became lodged in the ileocolic junction. Following the removal of the intra-luminal abdominal mop and abdominal closure, she experienced uneventful post-operative time period.

This case emphasizes the need of following surgical standards and how even tiny mistakes can have serious consequences. This demonstrates the necessity of combining technology and medicine, leading to the adoption of innovations like electronic counting and sponges with Radio-Frequency Identification (RFID) tags to reduce human error.

Keyword: Surgery; Gossypiboma; Surgical procedures; Medicine; Radio-frequency identification

Introduction

The term "gossypiboma" describes a persistent foreign body in the abdominal cavity, often a surgical sponge after a laparotomy. Originating from the Latin word "Gossypium" (cotton) and the Swahili word "boma" (place of concealment), it is sometimes referred to as textiloma or cottonoid [1].

According to estimates, one out of every 1000 to 1500 intra-abdominal procedures will result in gossypiboma. However, due to underreporting, the true incidence can be higher than reported. The situation emphasizes the necessity for cutting-edge methods and technologies and draws attention to serious flaws in surgical safety procedures. The work has been reported in line with the Surgical Case Report (SCARE) criteria [2,3].

This case report concerns a middle-aged woman who had a hysterectomy and came to us as an outpatient with stomach pain, a lump more on the right side of her lower abdomen and CECT abdomen, which helped us make a diagnosis. A big sponge that had totally eroded the bowel and extended into the terminal ileal segment and a portion of the sigmoid colon surprised us.

Case Presentation

36-year-old woman with complaints of abdominal pain and vomiting on and off, with abdominal discomfort for which she was under symptomatic treatment. No history of fever or no associated long-standing systemic illness. She had a short history of subtotal abdominal hysterectomy with bilateral internal iliac ligation 3 months back following a failed breech delivery. Per abdomen finding revealed lump in the right iliac fossa which was ill defined, irregular and non-tender, immobile.

Her blood counts were in normal limits ruling out any signs of current infection. CA-125 and CEA tests

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were performed subsequently due to the suspicion of malignancy (ovarian and colorectal, respectively). The tumor marker levels were within normal limits. USG abdomen and pelvis showed right sided hydronephrosis, left adnexal cyst, remnant uterus of 50x38x36 mm **(Figure 1)**.

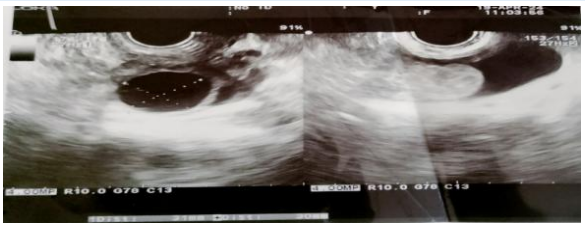

Figure 1: USG abdomen and pelvis showing right-sided hydronephrosis and left adnexal cyst.

Based on the CECT Whole Abdomen and Pelvis with IV contrast which suggested encapsulated thick-walled lesion with internal air foci in abdominal cavity measuring 4.6 x 5.7 x 7.3 cm, it was adherent anteriorly to rectus sheath and adjacent jejunal loops. A suspicion of gossypiboma in right iliac fossa region eroding into ileum colon junction **(Figure 2)**. Additional findings included bulky left ovary with simple ovarian cyst and streak of pelvic ascites.

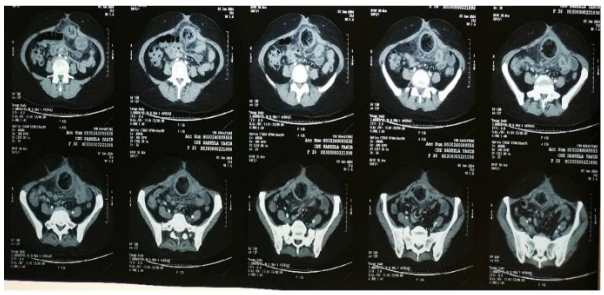

Figure 2: CECT whole abdomen and pelvis showing encapsulated lesion in the right iliac fossa indicative of gossypiboma.

On exploratory laparotomy dense interloop adhesions were present between last 2 feet of ileal loops, sigmoid colon and parietal wall. Enterotomy via sigmoid and resection of the clumped ileum done to retrieve a large surgical mop which has transmurally invaded bowel segment's major part from ileal loops and sigmoid **(Figure 3)** during 3-month course without any remnant in the abdominal cavity.

Figure 3: Per operative localization of the retained surgical mop within the abdominal cavity.

Primary repair of the enterotomy site in sigmoid and resection anastomosis of last 2 feet of ileum was done. **(Figure 4)** shows surgical mop with long finger like extensions (Staghorn type).

Figure 4: Surgical mop retrieved during the procedure, demonstrating its staghorn-like extensions.

The patient's vitals remained stable through-out the procedure and she was kept on NPO postoperatively with normal saline, antibiotics and pain management. She was orally allowed on post-op day 05 and discharged under satisfactory condition.

Discussion

Gossypiboma is more prevalent than the literature indicates. Emergency laparotomies, pelvic operations, obese patients, difficult laparotomies, worn-out doctors, prolonged operating hours, several sponges adhering together, inadequate tracking and mop/sponge counts are all considered high risk factors. Additional high-risk variables include a shift in the nursing or surgical staff, unskilled and inadequate support staff, an unforeseen change to the operational process and unaccountable human error [4,5].

Published estimates indicate that 0.3% to 1% of abdominal surgeries and 1.32 retained surgical items per 10,000 procedures occur [4]. Gossypibomas are most commonly detected in the abdomen (56%), pelvis (18%) and thorax (11%) [6,7]

The retained sponge may become encapsulated as a result of an exudative reaction in the early postoperative phase and a subsequent fibrinous response [8].

Acute abdominal gossypiboma symptoms include vomiting, bleeding and abdominal pain. Major complications include visceral perforation, obstruction, peritonitis, adhesion, abscess formation, fistula formation and septicemia. Chronic symptoms include pseudo-tumor characteristics such as inflammatory mass lesion, malignancy or bezoar [1,9-11]. There have also been reports of intraluminal migration in the literature [9].

As it mimics benign or malignant soft-tissue tumors of the abdomen and pelvis, gossypiboma can be

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challenging to identify [12].

Although plain radiography, ultrasound and Magnetic Resonance Imaging (MRI) have all been utilized for diagnosis, CT scan has been the most accurate technique for identifying retained objects. Typically, the ultrasonography feature is a distinct mass with a strong posterior shadow, a hypoechoic rim and a wavy internal echogenic focus [13].

When viewed on CT, gossypiboma may appear as a cystic lesion with an internal spongiform appearance, concentric layering, a hyperdense capsule, mottled shadows as bubbles or mottled mural calcifications [14].

MRI characteristics of gossypiboma in the abdomen and pelvis include the identification of a distinct mass with a low signal intensity peripheral wall on T1-weighted and T2-weighted imaging, whorled stripes visible in the center and peripheral wall enhancement following intravenous gadolinium administration on T1-weighted imaging [15].

A study found that 88% of gossypiboma cases had counts done during surgery, suggesting a high likelihood of false counts being accepted as true. Human error during count is also a significant role [13]. Additionally, there is a higher chance of miscount for patients having several surgeries performed by various teams or who have an intraoperative emergency while having surgery [13]

Our region's medical personnel have a rigorous work regimen, which may have contributed to the carelessness that our patient experienced [2]

To reduce the prevalence of gossypiboma, several national organizations have put in place a number of protocols, chief among them being sponge counting, intra and postoperative imaging and labeling sponges with barcodes or radio frequency identification [2].

Strict attention to the guidelines and procedures established by the American Council of Surgeons and the WHO is necessary to reduce the risk of gossypiboma. Guidelines state that the whole medical staff should try to find the missing sponge or gauze in the event of a miscount.

Since it has been demonstrated that human counting is prone to errors, a sponge barcoding technique may be used to enable electronic counting. This has demonstrated a decrease in error rates, removing human error that occurs during manual counting [2].

The practicality of using RFID-labeled sponges in routine surgeries has been demonstrated via trials in which the sponges were implanted in an animal and then removed, showing that the tags are detectable inside the body. The best way to solve this issue is to combine RFID technology with an electronic counting system. Despite being expensive to implement, it makes sense given the legal action that would result from a mistake that causes gossypiboma. It is a beneficial investment due to the legal expenses, patient compensation and attention to patient health [2].

Standardized count techniques and better patient care can reduce the incidence of gossypiboma, which is avoidable. It is important to promote careful staff training as well as accurate sponge and instrument counting. Preventing needless morbidity and mortality is possible with a high index of suspicion [9].

Differential diagnosis

- **Malignancy (ovarian or colorectal cancer):** The presence of an abdominal lump, along with nonspecific symptoms, often raises concern for malignancies like ovarian or colorectal cancer. Tumor markers such as CA-125 and CEA were tested to rule these out, but both were within normal limits.
- **Abscess or inflammatory mass:** The encapsulated lesion, visible on imaging with internal air pockets, could mimic an abscess or an inflammatory pseudotumor, often caused by infection or chronic inflammation.
- **Bezoar:** In some cases, the characteristics of gossypiboma might resemble a bezoar, particularly when there is intraluminal obstruction or a mass effect.
- **Foreign body granuloma:** The chronic inflammatory reaction to a retained object could lead to the formation of a granuloma, which may present similarly to gossypiboma.
- **Gynecological or renal conditions:** Associated findings, such as right-sided hydronephrosis and a left adnexal cyst, could lead to a suspicion of gynecological or renal pathologies contributing to the symptoms.
- **Intestinal obstruction or adhesions:** The lesion's erosion and its effect on adjacent bowel segments may mimic intestinal obstruction or adhesive bowel disease.

Conclusion and Results

Gossypiboma is a rare illness, however following strict surgery guidelines can prevent major complications such as infection, blockage and misdiagnosis of cancer. The case highlights the persistent issue of nonspecific symptoms leading to

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delayed identification and treatment. Thorough reporting of these cases will raise awareness of the terrible and deadly consequences of this completely preventable illness. The ability of medical professionals to clinically describe the illness will enable early diagnosis. The necessity of combining technology and medicine is also demonstrated by this case, which leads to further advancements like RFID and computerized counting. By encouraging a culture of ac-countability, ongoing learning and adherence to safety regulations techniques, the danger of gossypiboma can be considerably reduced, guaranteeing that it never occurs in surgical practice.

Ethical Approval and Consent to Participate

It is a case report exempted from ethical approval by the institutional Board of Review Rawalpindi Medical University, Rawalpindi. The patient consented to the use of her data for this publication.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Patient Consent

Written informed consent has been obtained from the patient in Urdu (the patient's native language). Upon request, we will send it to the respected journal.

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