

Postoperative complications due to a retained surgical sponge

Sarda A K, Pandey D, Neogi S, Dhir U

ABSTRACT

Retained surgical sponge or gossypiboma is a relatively common occurrence; however, surgeons may not report these events for fear of litigation and adverse publicity. We report postoperative complications in three cases due to retained surgical sponges. The first case, a 26-year-old woman, presented with gastric outlet obstruction due to the sponge obstructing the pyloric canal three weeks following cholecystectomy, which was completely relieved following endoscopic removal of the sponge. The second case, a 32-year-old woman, presented with repeated attacks of intestinal obstruction following cholecystectomy and tubal ligation and was treated with surgical removal of the sponge. The third patient, a 40-year-old woman, presented with features of colonic obstruction following hysterectomy. Colonoscopy revealed a partial migration of the sponge through the colonic wall and on laparotomy, she was found to have multiple internal fistulae between the small and large intestines, all occurring around the inflammation caused by the retained sponge.

Keywords: gossypiboma, gastric outlet obstruction, intestinal obstruction, retained surgical sponge

Singapore Med J 2007;48(6):e160-e164

INTRODUCTION

Gossypiboma is a pseudotumour within the body that is composed of non-absorbable surgical material with a cotton matrix. Although the real incidence is unknown, it has been reported to be one in 100 to 3,000 for all surgical interventions, and one in 1,000 to 1,500 for intraabdominal surgeries.^(1,2) These figures are probably an underestimate as a large number of such cases go unreported in view of the medicolegal nature of the problem.⁽²⁾ This condition poses a serious problem because of the unwarranted morbidity. Gossypibomas are a diagnostic dilemma as the symptoms are non-specific and variable, although finding a mass and abdominal pain are common.⁽²⁾ There can

be a long interval between surgery and clinical expression of this complication, particularly if the gossypibomas remains sterile.^(1,2) Gossypiboma in the abdominal cavity may lead to adhesion, abscess formation, intestinal perforation and other severe complications. The differential diagnosis of gossypiboma includes faecaloma, haematoma, abscess formation and tumour.

Gossypibomas most commonly occur following abdominal and gynaecological surgery, and generally require re-operation as soon as they are diagnosed as complications and morbidity is high.^(1,2) Some may be treated by endoscopic removal. We report three cases of gossypibomas treated over a span of ten years in a single surgical unit. The total number of admissions over the period of the study was 8,980, the number of cholecystectomies performed was 1,680, and the number of laparotomies performed was 1,920. Of this total number, we had two cases of retained sponge following cholecystectomy and laparotomy, respectively, and the third case was referred from an outside institution after hysterectomy.

CASE REPORTS

Case 1

This case presented as gastric outlet obstruction caused by complete migration of a surgical sponge. A 26-year-old woman presented with complaints of epigastric pain and recurrent episodes of vomiting for one week. She had undergone open cholecystectomy eight weeks prior to this visit. Other than mild tenderness in the epigastrium, her physical examination was normal. She was reassured and was put on antacid therapy. The following week, she presented again with persistence of symptoms and aggravation of vomiting the following week. On physical examination, she was dehydrated, was having tachycardia and a tender epigastrium. Abdominal radiograph and ultrasonography (US) were normal and the gallbladder fossa was empty. Upper gastrointestinal endoscopy revealed a protruding mass in the gastric antrum and duodenum. An intact surgical sponge was removed endoscopically. Two-thirds of the sponge was in the antro-pyloric region of the stomach and one-third was in the duodenum. The distal third of the sponge, which was present in the duodenum, was stained

Department of Surgery,
Maulana Azad Medical College and Lok Nayak Hospital, Bahadur Shah Zafar Marg, New Delhi 110002, India

Sarda AK, MS
Professor

Pandey D, MS
Registrar

Neogi S, MS
Registrar

Dhir U, MBBS
Resident

Correspondence to:
Dr Sushanto Neogi
C3A/33A Janakpuri,
New Delhi 110058,
India
Tel: (91) 11 2552 9124
Fax: (91) 11 2667 2594
Email: sushantoneogi@gmail.com

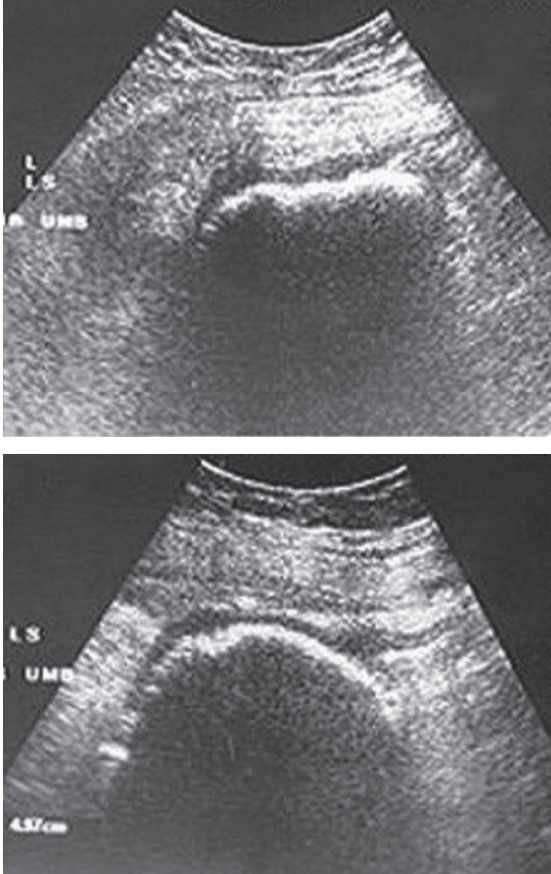


Fig. 1 Case 2. US images of the abdomen show a 7.5 cm × 5.5 cm hyperechoic rim with distal shadowing seen in the subumbilical region with signs of adjacent inflammation, suggestive of a foreign body.



Fig. 2 Case 3. Barium enema shows the intraluminal extent of the mass seen as a well-defined irregular filling defect in the distal sigmoid colon. The anterosuperior margin of the bowel cannot be seen, suggesting that the mass is either attached to that margin or has extensions beyond that margin. No fistulous tract was demonstrated.

with bile. After the sponge was taken out, erosions could be seen in the antrum. The patient was observed for the evidence of possible peritonitis, but had an uneventful stay. The patient has remained asymptomatic during the two and half years follow-up period.

Case 2

A 32-year-old woman presented with recurrent episodes of subacute intestinal obstruction of two months duration due to an intraperitoneal gossypiboma. She had undergone open cholecystectomy with tubal ligation four months ago. On examination, she was moderately anaemic, and during three admissions over the previous two months, she had exhibited features of abdominal distension with visible bowel loops and exaggerated bowel sounds, but with no evidence of any abdominal lump. Blood examination was repeatedly unremarkable except for a haemoglobin level of 8 gm/dL. Radiographs of the abdomen revealed multiple air-fluid levels with no radiological evidence of a

radiodense shadow. US was repeatedly unremarkable. A diagnosis of postoperative adhesions causing obstruction was entertained and she responded to conservative measures on two admissions. However, during her third admission, she did not respond to conservative measures. Repeat US of the abdomen revealed a 7.5 cm × 5.5 cm hyperechoic rim with distal shadowing seen in the subumbilical region with signs of adjacent inflammation (Fig. 1). The patient underwent surgery, which revealed a surgical sponge with inflammatory adhesions in the surrounding mesentery and ileal bowel loops just below the level of the sacral promontory. The sponge was separated from the adherent bowel and removed. Postoperative recovery was uneventful. The patient has remained asymptomatic during the three-year follow-up period.

Case 3

A 40-year-old woman presented with a one-year history of complaints of constipation and mucoid

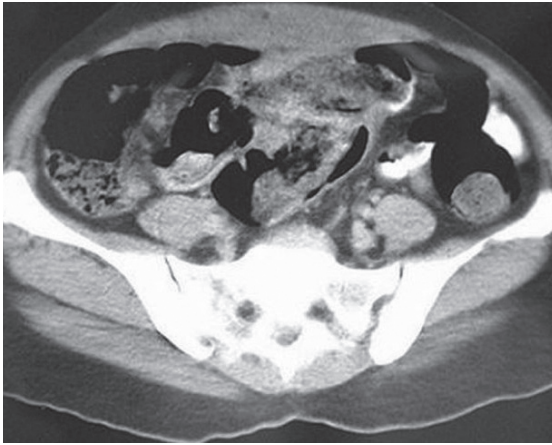


Fig. 3 Case 3. Axial CT image shows an irregular mottled soft tissue mass in the central lower abdomen with evidence of adjacent inflammatory thickening of the rectus muscle. It is difficult to tell whether the mass is intra- or extraluminal.

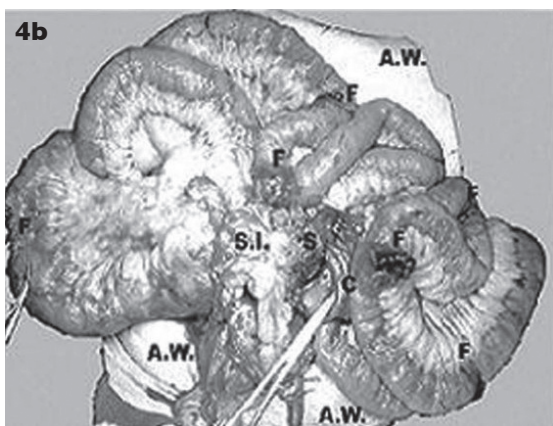


Fig. 4 Case 3. (a) Photograph of the surgical sponge taken after removal. [SI: portion of sponge projecting into the small intestine; C: portion of the sponge projecting into the sigmoid colon; CC: portion of the sponge in the central cavity with small bowel loops surrounding it and with fistulous communications to the cavity]. (b) Intraoperative photograph shows the relation of the sponge to different structures [AW: abdominal wall; S: sponge inside the cavity; SI: small intestine where portion of the sponge was projecting; C: colon where portion of sponge was projecting; F: fistulous openings in segments of small bowel opening into the central cavity].

discharge per rectum that started a few days after a hysterectomy for fibroid uterus. During this period, she had repeated urge to defaecate but passed only some mucoid discharge. The patient was advised laxatives, which helped for some time, but the symptoms recurred. There was no associated abdominal pain, fever, vomiting or any urinary complaint. The patient underwent a colonoscopy, which revealed a sponge protruding from the wall of the sigmoid colon. General physical examination was unremarkable. Systemic examination revealed a 10 cm × 8 cm non-tender, firm, well-defined intraperitoneal mass occupying the umbilical and hypogastric regions with minimal side-to-side mobility. The margins of the mass were well defined on all sides except for the inferior border where it was found to be entering the pelvis. Blood investigations, and radiographs of the chest and abdomen were essentially normal. Colonoscopy revealed an impacted sponge at approximately 35 cm from the anal verge, with inability to retrieve it. US findings were consistent with an intra-abdominal foreign body. Barium enema revealed an irregular filling defect in the region of the sigmoid colon, suggestive of an impacted gauze, but no communication to any abscess cavity or other bowel loops were revealed (Fig. 2). Enhanced computed tomography (CT) showed a heterogeneous structure with mottled air lucencies in the lumen of sigmoid colon, consistent with a foreign body (gauze piece). This structure could not be separately defined from the bowel wall at places. There were no features of extraluminal collections. However, thickening of the anterior abdominal wall muscles, suggestive of inflammation, was seen in this region (Fig. 3).

The patient subsequently underwent exploratory laparotomy, which revealed dense adhesions of a mass in midline with the parietal peritoneum. On separating the bowel loops from the mass, an abscess cavity measuring 6 cm × 4 cm × 6 cm, with multiple small bowel fistulae opening into the cavity, was noted. A surgical sponge was seen in the cavity with one end entering the sigmoid colon and the other end entering the terminal ileum, 30 cm proximal to the ileocaecal junction. The small bowel was found to communicate with the cavity at five places, and the large bowel was communicating at two places. Multiple internal herniations were seen around the bowel loops along with multiple internal bowel-to-bowel fistulae not communicating with the cavity (Fig. 4). A left ovarian cyst was noted and excised. The sponge was removed and resection anastomosis of the terminal ileum, repair of the internal fistulae, resection of the sigmoid colon and terminal colostomy were effected. Postoperative course

was largely uneventful, with the patient undergoing colostomy closure after six weeks. The patient has remained asymptomatic in the six months following the last surgery.

DISCUSSION

A retained surgical sponge or swab is also known as a gossypiboma, derived from *gossypium* (Latin; cotton) and *boma* (Swahili; place of concealment). A literature search revealed few data to describe population or even hospital level information regarding the prevalence of retained surgical materials. One study from a medical malpractice insurance company reported 40 cases in a seven-year period or about 1% of all claims.⁽³⁾ Since this estimate is based on malpractice insurance claims, it is likely to be a gross underestimate of the actual incidence. An unstructured review cited a prevalence ranging from 1:100 to 1:5,000 and an associated mortality ranging from 11 to 355, citing non-English medical references.⁽⁴⁾ A frequency of one in 1,000 to one in 10,000 operations is claimed but also state this to be highly variable in view of the medicolegal importance of these cases.⁽¹⁾ A retrospective review of medical malpractice claims data from a statewide insurer in Massachusetts stated 67 cases as a result of retained sponges or surgical materials.⁽³⁾ The study reported that 55% of the retained sponges were found after abdominal surgery and 16% after vaginal delivery.⁽³⁾ In cases with retained sponges, sponge count had been falsely correct in 76% of the non-vaginal surgeries; in 10% no sponge count had been performed at all. Interestingly, in three of 29 cases in which intraoperative radiographs were used to detect radiopaque sponges, the radiograph was falsely negative.⁽³⁾

The non-absorbable material of the retained surgical foreign bodies induces two types of reactions. One is an aseptic fibrinous response that creates adhesions and encapsulation, resulting in a foreign body granuloma.⁽²⁾ Patients with this response are at risk for pseudotumours and subsequent symptoms related to obstruction or presence of a space-occupying lesion. The other response is exudative in nature and leads to abscess formation, with or without secondary bacterial invasion. A sinus tract or fistula may develop in an attempt to extrude the foreign body either externally or into a hollow viscus. Patients become symptomatic when the foreign body erodes into the bowel or vessels or by causing fistulae, abscesses, obstruction, bleeding or chronic pain.⁽²⁾ Transmural migration of sponges is rare.^(2,5) The stomach is an even more unusual site⁽⁶⁾ for such migration because of its relatively small surface area, higher location in the abdomen and thick wall.^(6,7)

Surgical teams have routinely used sponge, sharp, and instrument counts as protection against this problem for decades.⁽⁸⁾ Four separate counts have been recommended: the first when the instruments are set up or sponges unpackaged, a second before surgery begins, a third as closure begins, and the final count performed during subcuticular or skin closure. The purpose of such protocols is that discrepancies at any stage are pursued with repeat counts and if the discrepancy persists, steps are taken to locate any unaccounted for items.⁽⁸⁾ While the practice of sponge counts is a time-honoured, simple, preventive measure, it is heavily dependent on human performance practices and is thus subject to human error.⁽⁸⁾ Incorrect counts and incorrect “correct” counts should trigger an adjunctive procedure, such as a portable intraoperative radiograph to detect the presence of the “miscounted” object.⁽⁹⁾ Other practices that are currently acceptable is to have a circulating staff who keeps a written count of the instruments and gauze before starting surgery and repeats the same at the end of the procedure. The used gauze are hung on to stands and then counted so that none gets inadvertently discarded. Bar-coding or impregnating sponges with detectable sensors would be new ways to improve an old practice. Otherwise use of radiopaque markers and even routine postoperative radiographs may decrease the incidence of retained sponges.⁽⁹⁾

It was found that patients with retained foreign bodies were more likely to have had emergency surgery, an unexpected change in surgical procedure, or a higher mean body-mass index, and were less likely to have had sponge counts performed at the time of the operation.⁽¹⁰⁾ Another claims study revealed that in 10% of cases where retained sponges were found, no sponge counts had been performed.⁽¹⁰⁾ Other reasons for retained sponges include procedures performed after hours, lengthy procedures, change in nursing staff during procedure, more than one surgical team working and lastly, the unaccountable human error.⁽¹⁰⁾

Retained sponges may be seen on US as cystic masses with echogenic, wavy stripes in the centre, casting acoustic shadows.^(11,12) When a mass with hyperechoic wavy structures and posterior acoustic shadowing is seen on US, the history of previous surgery must be questioned.⁽¹²⁾ Enhanced abdominal CT usually shows a soft-tissue mass with a dense, enhanced wall, containing an internal high-density area with air-bubbles in the mid-abdomen. A fistula between the abscess cavity containing the suspicious mass and gastrointestinal tract may also be identified on CT or by an upper gastrointestinal series.⁽¹²⁾

REFERENCES

1. Gencosmanoglu R, Inceoglu R. An unusual cause of small bowel obstruction: gossypiboma – case report. *BMC Surg* 2003; 3:6.
2. Bani-Hani KE, Gharaibeh KA, Yaghan RJ. Retained surgical sponges (gossypiboma). *Asian J Surg* 2005; 28:109-15.
3. Kaiser CW, Friedman S, Spurling KP, Slowick T, Kaiser HA. The retained surgical sponge. *Ann Surg.* 1996; 224:79-84. Comment in: *Ann Surg* 1997; 225:442.
4. Lauwers PR, Van Hee RH. Intraperitoneal gossypibomas: the need to count sponges. *World J Surg.* 2000; 24:521-7.
5. Risher WH, McKinnon WM. Foreign body in the gastrointestinal tract: intraluminal migration of laparotomy sponge. *South Med J* 1991; 84:1042-5.
6. Mentis BB, Yilmaz E, Sen M, et al. Transgastric migration of a surgical sponge. *J Clin Gastroenterol* 1997; 24:55-7.
7. Manikyam SR, Gupta V, Gupta R, Gupta NM. Retained surgical sponge presenting as a gastric outlet obstruction and duodeno-ileo-colic fistula: report of a case. *Surg Today* 2002; 32:426-8.
8. Gibbs VC, Auerbach AD. The retained surgical sponge. In: Shojania KG, Duncan BW, McDonald KM, Wachter RM, eds. *Making health care safer: a critical analysis of patient safety practices. Evidence report/technology assessment.* Rockville, MD: Agency for Healthcare Research and Quality; 2001:255-7. Publication no: 01-E058.
9. Reno D, Lobb J. Recommended practices for sponge, sharp, and instrument counts. AORN Recommended Practices Committee. In: 2000 Standards, recommended practices and guidelines: with official AORN statements. Denver, Colorado: Association of Operating Room Nurses; 2000:213-9.
10. Gawande AA, Studdert DM, Orav EJ, Brennan TA, Zinner MJ. Risk factors for retained instruments and sponges after surgery. *N Engl J Med* 2003; 348:229-35. Comment in: *N Engl J Med* 2003; 348:1724-5.
11. Sugano S, Suzuki T, Iinuma M, et al. Gossypiboma: diagnosis with ultrasonography. *J Clin Ultrasound* 1993; 21:289-92.
12. Kokubo T, Itai Y, Ohtomo K, et al. Retained surgical sponges: CT and US appearance. *Radiology* 1987; 165:415-8.