

Short Report

The retained surgical sponge following laparotomy; forgotten at surgery, often forgotten at diagnosis. Our experience.

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Abstract

Retained surgical sponge following laparotomy is an oversight with potentially serious repercussions for the patient, the operating team and the hospital. The diagnosis requires a high index of suspicion as the variety of presentations can easily be confused with commoner postoperative complications.

We present 5 cases managed at Ahmadu Bello University Teaching Hospital, Kaduna from 2000-2005 with review of literature to highlight the diagnostic, therapeutic and preventive challenges in this part of the world. A patient presented with intestinal obstruction and severe malabsorption, another, severe intraabdominal sepsis and organ failure which led to death and three with enterocutaneous fistula. Confirmation of retained surgical sponge was made only at surgery in three patients and after expulsion of the sponge per rectum in two.

The possibility of retained surgical sponge should be considered as a remote cause of postoperative abdominal symptoms especially if such surgeries have been conducted in peripheral clinics or hospitals in our environment. Surgeons in this country also have a particular duty to ensure that the sponges used during laparotomies are removed and to supervise preventive measures to ensure that they are not retained, as the precarious financial position of our patients make further postoperative investigations and relaparotomy even more difficult.

Introduction

Postoperative retained surgical sponge [variously referred to as gossypiboma, textiloma or gauzioma] has been estimated to occur once in 100-3000 surgeries and once in 1000-1500 laparotomies even though many cases are not reported to avoid medico-legal consequences¹⁻⁴. This misadventure continues to plague surgical practice because preventive measures which should be routine are either not taken lightly in many theatres or dispensed with altogether⁵. Retained abdominal sponges not detected and removed immediately after surgery may present as a spectrum of manifestations^{1-3, 6-9}, some of which are life threatening. In acute cases abscesses and intestinal fistulae dominate while chronic forms are characterized by aseptic masses which may remain asymptomatic or present years later. The bowel often bears the brunt of attempt to expel the foreign body, resulting in intestinal complications like paralytic ileus, perforation, fistula and intestinal obstruction. Clinical suspicion of post-laparotomy retained sponge may be relegated to the background where awareness is low because the manifestations are more likely to be confused with commoner postoperative complications. We present the case of a lady who had delayed presentation of a retained surgical sponge

following abdominal surgery with severe nutritional consequences, and summaries of four other patients managed at Ahmadu Bello University Teaching Hospital, Kaduna, from 2000 to 2005.

Presentation Patient I

Was referred as a 42 year old housewife with postoperative intestinal obstruction from adhesions. She had total abdominal hysterectomy for uterine fibroids in a private clinic two years earlier. Post operatively, she had paralytic ileus, requiring nasogastric tube drainage for 7 days and spent a further two weeks recovering from the surgery. Eight months after surgery, she developed colicky abdominal pain, vomiting and abdominal distension which subsequently became recurrent. She went back to the clinic and visited other hospitals but was managed conservatively. Not satisfied, she decided to seek spiritual help. She suspected she was under "spiritual attack", from a rival who was taking advantage of her ill health to snatch her husband. She traveled from Kaduna to Lagos and spent 6 months consulting spiritualists. Over this period she lost weight considerably and lost friends, being regarded as an AIDS patient. She also endured several HIV

tests from clinics she visited, confirming HIV-seronegativity on all occasions. Examination at presentation revealed she was moderately pale and cachectic, weighing 45 kg at 1.65m of height. Here blood pressure was 90/60mmhg with a heart rate of 118 beats per minute. There was generalized pitting oedema. There were hypoproteinemic skin changes and features of right lobar pneumonia. Abdominal examination showed a sub-umbilical midline surgical scar, abdominal distension, increased bowel sounds and a vague mass in the left iliac fossa. Laboratory investigation revealed haematocrit of 22%, total leukocyte count of $9 \times 10^9 / L$ with normal creatinine, electrolytes and blood sugar values. She however had severe hypoproteinemia with serum albumin of 19 g/dl and total protein of 48 g/dl. Abdominal ultrasonography Fig 1 described the left iliac fossa mass as being cystic with solid areas and calcifications, and concluded that the mass may be an ovarian cyst or a reaction to a stitch [see attached film]. The working diagnosis was postoperative intestinal obstruction with severe malnutrition and lobar pneumonia. She was promptly resuscitated with restoration of the hemoglobin and blood pressure to normal while the lobar pneumonia responded to antibiotics. Three months of oral nutritional therapy with elemental dietary supplements which was intermittent because of recurring attacks of

Fig 1 US-Left lower Quadrant mass(Gauze)



intestinal obstruction, restored the serum albumin and total protein levels to 5.2 g/dl and 8.7g/dl respectively, and weight gain to 69kg, in absence of parenteral nutrition. At subsequent laparotomy, an indentable intraluminal mass was found within 28cm of inflamed and oedematous jejunioileum. This segment of bowel was resected with end to end jejunioileal anastomosis. On opening the segment of bowel after closure of wound, a long roll of surgical gauze was found soaked in faecal matter. Histopathological examination of the resected segment revealed transmural inflammation composed of lymphoplasma cells and polymorphs, areas of patchy mucosal ulceration and necrosis, with areas of muscle wall hypertrophy. Recovery from surgery was uneventful and at two years later, she is struggling to loose weight having gained up to 90kg, and happily living with her family.

Patient II

Was a 28 year housewife referred with deterioration following caesarian section which she had a week earlier for obstructed labour. Examination revealed she was acutely ill with a temperature of $39.2^{\circ}C$, heart rate of 118 per minute, blood pressure 110/60mmhg and respiratory rate of 30 per minute. A nasogastric tube in place drained bilous aspirate and urine from indwelling catheter was concentrated. The abdomen was distended with tenderness, guarding and decreased bowel sounds. Pelvic examination showed tender, bulging Pouch of Douglas. Laboratory investigations revealed serum potassium of 2.5mmol/l, haematocrit of 26% and serum creatinine, 256mmol/l. A clinical impression of intraabdominal sepsis and acute renal failure following caesarian section was made. She was resuscitated with correction of serum potassium and anemia but the creatinine level continued to rise. At emergency relaparotomy, a large abdominal towel, 32cm by 60cm was found in front of the gut. Over two litres of pus was drained from the pelvis and paracolic gutters. There was dehiscence of the uterine wound and necrosis of most of the uterus. She had subtotal hysterectomy and peritoneal lavage. Postoperatively, the renal function continued to deteriorate while attempts to get her to haemodialysis failed for lack of funds. She died four days after the relaparotomy.

Patient III

was a 25 year old student who had surgery for acute abdomen at a peripheral hospital, and developed postoperative enterocutaneous fistula. At examination two weeks after the surgery, he was in stable condition but was draining faeculent fluid through a drainage incision to the right side of an infected, superficially dehiscd midline laparotomy wound. Abdominal ultrasound examination did not reveal any remarkable finding and a diagnosis of postoperative enterocutaneous fistula was made. He improved on enteral dietary regimen and the effluent reduced while he was emptying bowel regularly. After two weeks of admission, the patient passed out an unusual object per rectum in the toilet and this was brought to the attention of one the authors who examined and found it to be surgical gauze covered in faeces. Subsequently, the drainage stopped, the fistulous tract healed and patient was discharged

Patient IV

was a three year old boy who had coloanal pull through operation via abdomino-sacroperineal approach for high anorectal anomaly on transverse loop colostomy. A swab and instrument count was said to have been 'correct' after the surgery. Initial postoperative recovery was uneventful and the child was discharged ten days after surgery continent of faeces. The mother however brought the child back with slight faecal discharge through the sacral incision. The coloanal anastomosis was examined and found to have healed. The mother was reassured after thorough clinical examination that the discharge will stop. This did not happen and after two weeks, a

fistulography was ordered. Immediately after the procedure, the child emptied bowel and an object examined and found to be a piece of surgical sponge was passed along with faeces per rectum. Within a week, the discharge stopped and the sacral wound sealed.

Patient V

was a 36 year old male trader referred as a case of enterocutaneous fistula following laparotomy for typhoid perforation. The main finding on examination was the copious discharge of faeculent material through a midline laparotomy wound. After correction of dehydration, anemia and hypokalemia, an abdominal ultrasound did not reveal any unusual findings. A diagnosis of enterocutaneous fistula from anastomotic leakage was made. Fistulography showed that the fistula was a side ileal fistula and a decision was taken to manage conservatively with enteral elemental diet. After six weeks, the fistula had not closed and he was explored. There was a rent in the ileum at the level of anastomosis 8 cm from ileocecal junction proximal to which a surgical swab was retrieved from the lumen. The anastomosis was resected and ileal continuity restored in two layers. The patient recovered from surgery and has been lost to follow up.

Discussion

These five cases exemplify the variety of presentation, diagnostic and therapeutic challenges and outcome of retained surgical sponge following laparotomy. The first patient presented with chronic symptoms of small bowel obstruction, protein-calorie malnutrition and abdominal mass; the second severe intraabdominal sepsis and organ failure and the last three as postoperative intestinal fistulae. In none of these patients was a diagnosis of retained surgical sponge initially considered even though a diagnosis should have been made on the basis of ultrasound on Patient 1 a year earlier to surgery. Two patients expelled the surgical sponge per rectum, three required laparotomy and there was one death. The psychosocial consequences of chronic ill health in this part of the world was evident in the first patient, while the second patient reflects a common and unfortunate financial situation our patients face after stretching their meager resources on their first surgery. The intestinal tract represents a weak line of resistance through which the defense mechanisms in the peritoneal cavity attempt to expel a retained surgical sponge. Reports indeed show that in a number of instances, there are successful expulsions of the sponge through the rectum^{10, 11}, depending on the size of the sponge small enough to pass through the ileocecal junction or by direct penetration of the colorectum as was shown in Patients 3 and 4 respectively. Wattanasirichaagoon¹² in an experimental study, demonstrated the transmural migration of a 4cm by 4cm surgical sponge placed in the abdomen of 10 of 36 Wistar rats which was neither associated with a seromuscular incision nor the site of placement. He proposed four stages for the fate of retained surgical sponge in the abdomen; foreign body

reaction, secondary infection, mass formation and remodeling. The involvement of the intestinal tract accounts for some of the common manifestations of retained surgical sponge following laparotomy namely intestinal fistulae, intraabdominal sepsis and intestinal obstruction. A sponge which has migrated into small bowel may cause obstruction without any indication of a breach in the bowel wall^{12, 13} as in Patient 1, or obstruction may be associated with a connection to an abscess cavity at the site of bowel penetration³. The protein-calorie malnutrition seen with Patient 1 is an unusual complication of transmural migration of surgical sponge which has also been reported by Sinha¹⁴. The combination of decreased intake from recurrent intestinal obstruction, the sheer physical size of the sponge and the chronic transmural inflammation of a long segment of jejunioileum with mucosal ulceration and necrosis interfering with digestion and absorption may be responsible for the severe degree of malabsorption seen in the patient. Intra-abdominal abscess may result from the sponge acting as a nidus for infection in addition to bowel disruption. Other infective presentations include wound infection and persistent sinuses. The aseptic granulomas caused by retained surgical sponge present as nonspecific abdominal pain or as masses which may easily be confused with malignancy. These granulomas may be asymptomatic for years or may be discovered as an incidental finding. Kaiser et al¹⁵ found only 7 out of 29 [24%] intraabdominal sponges to be symptomatic, an indication that perhaps, most retained sponges are probably never discovered. Diagnostic difficulty is a well documented feature of gossypiboma and has led to many unnecessary radical surgeries^{6, 11, 16-21}. A rule of the thumb for diagnosis of abdominal gossypiboma is to consider this possibility in any patient presenting with symptoms at any time after a previous laparotomy. Plain x-rays have limitations in the diagnosis as the surgical sponges used in many centres do not have radio-opaque markers. The marker may be confused with radio-opaque bowel contents, surgical clips or other intraabdominal calcifications and are known to disintegrate with time^{3, 15}. Aside from the radio-opaque marker, other features of gossypiboma on plain x-ray include calcifications and the 'whirl-like' pattern²². The ultrasonography is a useful adjunct; the common finding is a poorly echogenic or cystic mass, with hyper echoic centre of wavy structures and sharply delineated posterior acoustic shadow^{3, 22}. Contrast enhanced computerized tomographic scan showing a hypodense lesion with enhanced peripheral rim and internal high density or air bubbles or a heterogeneous abscess-like mass; and magnetic resonance imaging provide the best description of gossypiboma^{1, 3, 22-26}. Once discovered, retained surgical sponge is best removed surgically. There are reports of diagnosis and removal by laparoscopy but the validity of this method has been questioned^{3, 27}. As seen from the patients presented, the overall burden on the patient with retained surgical sponge following laparotomy is heavy, ranging from prolonged morbidity and hospital

stay, multiple surgical interventions, costly investigations, increased overall cost of care, psychosocial distress to mortality. One of the larger abdominal gossypiboma series of 24 patients reported sponge and instrument count policy of which four counts are recommended for the scrub and circulating nurses; at setting up of instruments, just before incision, at the start of closure and at skin closure^{2, 3, 5, and 15}. In some theatres, it is common practice to write the result of each count boldly on a board for comparison. The surgeon has a duty to supervise these counts and to explore the body cavity before closure routinely. Cases have been reported in which the surgeon was found liable for falsely accurate counts, even though it is common knowledge that the operating theatre nurses are responsible for the sponge and instrument counts¹⁵. Other recommendations include the use of surgical sponge with radio-opaque marker and the practice of holding sponges, abdominal packs and towels with large forceps. In the event of a discrepancy in the sponge and instrument counts, the surgeon is expected to commence investigations, including re-exploration, plain x-rays and other imaging studies. Tagging of surgical sponges with electronic device²⁸ or radiofrequency identification chip² are recent technologies with promising preliminary results. The importance of awareness in the prevention must be emphasized and the operating team should remember the possibility of this complication at every laparotomy. In spite of these measures gossypiboma still occurs because comprehensive prevention strategy is usually not fully

a mortality of 10%. These problems as well as the possibility of financially crippling or career-threatening medico-legal consequences emphasize the need for prevention. Crucial to prevention is a proper implemented in many centres. In some theatres such as found in many of our clinics and hospitals, prevention strategies are either dispensed with or not possible because of non-availability of trained personnel and questionable operating standards. Kaiser et al¹⁵ showed that retained foreign body occurred in 76% of laparotomies with an 'accurate' count and in three patients with negative x-rays. Reasons given for incorrect count included team fatigue, end of shift, adherent sponges, surgeon declined repeat count, incorrect package count, conversation in the operating room, operating nurse left the room and sponge looked for and not found. Gawande et al have reported obesity, emergency operation and unexpected change in procedure as high risk factors for retention of surgical sponge²⁹. **Conclusion** A high index of suspicion is required to make early diagnosis of retained surgical sponge following laparotomy and it should be considered in any patient presenting with symptoms at any time after abdominal surgery. Our hospitals and health policy makers should ensure that all theatres carry out comprehensive preventive measures routinely and enforce zero-tolerance policy. Operating surgeons should actively supervise these measures and should always remember to explore the surgical wound and not depend solely on the 'accuracy' of the swab and instrument count to prevent retention of surgical sponges

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