Review Artical

Complete Intraluminal Migration of Surgical Sponge (Gossypiboma) With Complete Intestinal Obstruction

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Abstract

A 33 years aged gentle lady presented with the features suggestive of acute intestinal obstruction due to complete intraluminal migration of a laparotomy sponge, five years after open cholecystectomy in a private clinic. Contrast enhanced CT scan of whole abdomen revealed an elongated intraluminal mass in the distal ileum causing intestinal obstruction. Exploratory laparotomy revealed circumvented loop of ileum with intraluminal mass sized around 6x12 cm in the terminal ileum. Enterotomy delivered a surgical sponge with no external or internal communication. Though intraluminal migration of retained surgical sponge has often been reported. But complete migration with features of intestinal obstruction is rare.

Keywords *Gossypiboma, Intestinal obstruction, Laparotomy, Retained surgical sponge.*

Introduction

A retained surgical sponge in the abdominal cavity following a laparotomy is not uncommon[1]. But complete migration of such a sponge into the bowel lumen is a rare event[2]. Because of varied non specific symptoms at presentation, a preoperative diagnosis of retained sponge is not easy and needs high index of suspicion along with proper radiological investigations [1,2]. Here we report a case of complete intraluminal migration of surgical sponge with complete intestinal obstruction and review of literature.

Case Report

A 33 years aged, divorced lady from Tongi, Dhaka, UHID- was admitted through emergency with the history of colicky abdominal pain, distension, nausea, vomiting and obstipation. She underwent open cholecystectomy 5 years back in a private clinic. Since then she was suffering from occasional abdominal pain, low grade fever. She was receiving antipsychotic drugs for this pain & depression. Being a divorce her abdominal symptoms were ignored and she was put on antipsychotic drugs. On examination, she looked toxic and depressed. There were signs of dehydration, vital signs were altered. Abdominal examination revealed distension with mild diffuse tenderness with increased bowel sound. DRE- revealed ballooning of rectum. Except leukocytosis all other biochemical and hematological parameters were within normal limit. X-ray abdomen revealed multiple air fluid level with absence of large bowel shadow. There were no radio-opaque marker. However CECT whole abdomen revealed a mass in the distal part of the ileum marked dilatation of the proximal ileum. At laparotomy, adhesion noted in the right supracolic compartment due to previous surgery. More adhesion noted in the ileocaecal junction between small bowel. Bowel proximal to the distal ileum was grossly dilated & distal to it was collapsed. With enterotomy a surgical sponge was completely retrieved from the distal ileal lumen. She recovered early and discharged on POD 6th. Since then she is doing well.

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Discussion

The term 'Gossypiboma' denotes a cotton foreign body that is retained inside the patient's body during surgery [3]. It is derived from the latin gossypium (cotton) & Kiswahili "boma" (place of concelement)[4]. It has been reported to occur following surgical procedures such as abdominal, thoracic, cardiovascular, orthopedic and even neurosurgical operations [3,5,6,7,8]. Retained foreign bodies following surgery are not uncommon although the real incidence is unknown, with a reported frequency of 1:100 to 1:3000 for all surgical procedures and 1 in 1000 to 1500 for intra-abdominal operations [1,9,10]. The most common being gynaecologic surgery, followed by thoracic[11], cardiovascular[6], orthopedic[12], neurosurgical[13] and soft tissue[14] surgery.

The most common foreign body left during laparotomy is a surgical sponge. The retained sponge and the surrounding foreign body reaction has been variably reffered to as testilomas, gossypiboma or cottonoid[2]. The sponge may remain asymptomatic for years or may lead on to a variety of presentation such as abscess, intestinal obstruction, perforation, hemorrhage, granulomatous peritonitis etc. The presentation can vary between 2 days to 28 days following surgery[1,15]. The most interesting aspect of a sustained sponge is its complete intraluminal migration and related consequences as occurred in our patient.

Mechanism of Intraluminal migration

The proposed mechanism of migration into the bowel is that the sponge gets encapsulated within the loops of bowel and the resultant inflammatory peritoneal reaction[16]. Gradually it causes pressure necrosis of the bowel wall, partly enters the bowel and the rest of it is pulled into lumen by peristaltic activity[17,18]. This intraluminal foreign body along with adhesions and kinking in the bowel may cause intestinal obstruction or it may sometimes pass uneventfully per rectum[18].

Risk factors

New England Journal of Medicine published 8 risk factors - These are emergency operation, unexpected change in operation, BMI, more than one surgical team involved, change in nursing staff during procedure, volume of blood loss, female sex and surgical counts. First 3 were found to be statistically significant by multivariate logistic regression. There was 9 fold increase in risk associated with emergency surgery and in 88% cases where there was a RFB and counts were performed, and the counts were falsely called correct[19].

Various Imaging Finding:-

Retained foreign body images in various ways in various imaging modalities.

Conventional radiography - Radio opaque marker on sponge, whirl-like pattern of sponge, calcified mass.

CT Scan - (i) Well defined mass with soft tissue attenuation.
(ii) Whorled appearance- may contain gas bubbles within fibre meshwork.
(iii) Outer rim may contrast enhance.
(iv) May have peripheral calcification or calcification within mass.

Ultrasound - Echogenic 'wavy' structure (sponge) within a mass with acoustic shadowing.

MRI - (i) Well defined mass.
(ii) Capsule has low signal intensity on T1 & T2.
(iii) T1 - Variable signal density central fluid; low signal intensity non enhancing sponge material.
(iv) T2 - High signal intensity central fluid; whorled appearance of sponge material: low signal intensity peripheral rim.

Differential diagnosis

(i) Postoperative collection, adhesion.
(ii) Abscess, Abdominal tuberculosis.
(iii) Hematoma.
(iv) Malignancy[20].

Pathological presentation

It may present in two ways:- *Type-I* - an exudative inflammatory reaction with the formation of an abscess. The *Type-II*- Aseptic fibrotic reaction to the cotton material and development of a mass. Intraoperative complication during removal of RFB- one possible complication is perforation of adherent bowel specially with small incision.

Preventive measures

"Radiographic screening" at the end of high risk cases. Use of Radiologically detectable sponges and towels in the surgical site. Careful use of sponges in large cavity to perform a methodical wound examination each and every time before beginning to close the wound[21]. New technologies are being developed that will hopefully decrease the incidence of RFB. An electronic article surveillance system has been examined which uses a tagged surgical sponge that can be identified electronically[22].Bar codes can be applied to all sponges

and with the use of a bar code scanner the sponges can be counted back table. The use of radiofrequencyidentification systems hold much hope for application in the area of detection of sponges[21].

Treatment

Although some non surgical approaches such as percutaneous radiological retrieval of foreign bodies are reported, they might either be unsuccessful or generate attendant complications[23]. Surgery is the most reliable method for removing foreign bodies especially from the abdomen. Development of a fistula to neighboring organs such as stomach, duodenum or intestine occurs infrequently[24,25,26].The longer the retention time, the higher is the fistulization risk. Foreign bodies (e.g Surgical sponge) may completely migrate into the ileum without any apparent opening in the intestinal wall[27]. They usually cannot pass the ileocecal valve and cause complete intestinal obstruction at this level, that has happened to our case. However, if they can pass through this valve, they are easily discharged through the anus. Results are best with early surgery and mortality may rise up to 18% if it is delayed[15,18,28].

Conclusions

Although gossypiboma is rarely seen in daily clinical practice, it should be considered in the differential diagonosis of acute mechanical intestinal obstruction . In patiants who underweent leparotamy prevensly specially in clinics. The best approach in the prevention of this condition can be achieved by meticulous count of surgical materials in addition to through exploration of surgical site at the conclusion of operation and also by routine use of surgical textile materials impregnated with a radio-opaque marker.

List of abbreviations used

USG - Ultrasound
CECT - Contrast enhaced Computerized Tomography
MRI - Magnetic Resonance Imaging
RFB - Retained foreign body

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