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Case Report

Transgastric migration of retained intraabdominal surgical sponge: Gossypiboma in the fundus ☆

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ABSTRACT

The retention of a surgical sponge is a rare complication that presents diagnostic challenges and carries the risk of potential complications. Two distinct foreign body reactions, fibrinous, and exudative, can result in the formation of a granuloma (known as gossypiboma) or lead to complications such as abscess formation and migration into the gastrointestinal tract.

In this report, we present the case of a 33-year-old woman with a history of splenectomy who presented with symptoms including epigastric pain, vomiting, and episodes of hematemesis. Imaging studies, including computed tomography and magnetic resonance imaging, revealed a mass consistent with a gossypiboma that had migrated transmurally into the stomach. The diagnosis was subsequently confirmed through gastroscopy, and successful endoscopic removal of the retained surgical sponge was performed.

Introduction

Gossypiboma refers to a mass composed of a cotton matrix that elicits a foreign-body reaction within the body. Its presence can lead to pressure necrosis of the bowel wall, ultimately resulting in the extrusion of the sponge into the bowel lumen. Transmural migration of a gossypiboma has been reported in various anatomical locations, including the stomach, ileum, colon, urinary bladder, diaphragm, trachea, vagina, spine, pericardium, nose, breast, lung parenchyma, and urethra [1]. Diagnosing gossypiboma can be challenging, as it may mimic malignancy, abscess, or exudative granulomatous reactions. Delayed diagnosis can lead to complications. In this report, we present the radiological and endoscopic imaging of a transmurally migrated gossypiboma in the stomach.

Case report

We report the case of a 33-year-old woman who has been experiencing atypical abdominal pain for the past year associated with episodes of vomiting and hematemesis. The pain is localized in the left hypochondrium, nonradiating, characterized by a feeling of heaviness occurring intermittently. Her

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Fig. 1 – Plain radiography that was unremarkable and showed no radiopaque marker.

medical history includes a splenectomy performed a year and a half ago. The patient does not report any general health impairment. On clinical examination, there is mild epigastric and left hypochondrial tenderness. Routine blood tests, including a complete blood count, coagulation profile, blood electrolytes, liver function tests, C-reactive protein, lipase, and fasting blood glucose, showed no abnormalities. Tumor markers (Alpha-fetoprotein, CA19-9, ACE) were within the normal range. Plain radiography (Fig. 1) indicated a mass including gas bubbles in the projection of the left hypochondirum but showed no radiopacity.

Subsequent abdominal CT imaging unveiled a 4.2 cm hypodense mass exhibiting a spongiform appearance and a mildly enhancing hyperdense wall, communication with the stomach lumen through the fundus, with important fat stranding around the mass (Fig. 2). The MRI revealed that the lesion demonstrates heterogeneous high signal intensity on T2-weighted images and homogeneous low signal intensity on T1 weighted images with a mildly enhancing wall after injection of gadolinium (Fig. 3). A gossibipoma was suspected given the patient's history, although we did not find any radiopaque marker.

A gastroscopy was then performed, revealing surgical gas compress at the fundus (Fig. 4) that had migrated through the stomach wall. It was successfully removed endoscopically, and the recovery of the patient was uneventful.

Discussion

The textiloma is a lesion formed as a result of forgetting a textile foreign body during a surgical procedure. The more academic term "gossypiboma" reflects the inflammatory reaction induced by a textile material in contact with tissues, leading to the formation of an inflammatory granuloma. The reported frequency in the literature ranges from 1/1000 to 1/10,000 [4]. A literature reviews emphasize the predominance of intraperitoneal textilomas (52%), but other sites are also affected: gynecological (22%), urological and vascular (10%), osseous and spinal (6%), miscellaneous (10%). The inadvertent retention of materials remains a fear for surgeons during any intervention, and the consequences for the patient can be devastating [1]. Multivariate analysis revealed a correlation between the incidence of textilomas and key risk factors such as elevated body mass index in patients, emergency procedures, and unanticipated alterations in the planned surgical procedures. Additional risk factors encompass alterations to the operating team during a procedure, substantial blood loss (>500 mL), failure to conduct a proper count of instruments post-procedure, and excessive fatigue among the medical staff [2].

Cotton sponges, due to their inert nature, resist biomedical modifications. Consequently, 2 discernible categories of foreign body reactions may manifest. The first 1 involves a fibrinous reaction resulting in adhesions and encapsulation, forming a potentially asymptomatic foreign body granuloma known as "gossypiboma." This granuloma may undergo various processes such as calcification, disruption, partial absorption, and even diffusion. The second type is an exudative reaction, causing inflammation and abscess formation, potentially leading to complications like external fistulas and migration of the foreign body into the gastrointestinal tract. Symptoms frequently emerge in the early postoperative period due to the exudative response, but the extrusion process can extend over several years, and the clinical manifestations are nonspecific [3].

The literature suggests that the migration of a surgical sponge into the bowel is rare compared to the formation of abscesses, chronic fistulas, or foreign body granulomas. Once a sponge enters the intestinal lumen, peristaltic activity advances it through the bowel, potentially causing multiple perforations. Adhesions may trap the sponge, leading to inflammatory reactions and impaction, which increases the risk of obstruction and the formation of fistulas in the affected bowel segment [3]. The process of transmural migration is a consequence of inflammation progressing to necrosis [4]. The intestine is the most frequently impacted site, primarily attributed to the relatively expansive outer surface of the small intestine and the minimal resistance provided by its thin wall. In contrast, the stomach is an uncommon location for transmural migration. This rarity can be attributed to its smaller outer surface area, elevated position in the abdomen, and thicker wall compared to the small intestine [5].

The patient's medical history is crucial in the development of the diagnosis. Various nonspecific symptoms associated with gossypiboma. While the initial type of reaction may present with mild clinical symptoms such as a painless abdominal mass, even asymptomatic cases, exudative reactions can manifest with a severe clinical course leading to complications such as intestinal perforation, obstruction, fistula formation, or sepsis. The interval between the operation and the clinical presentation is variable [3,6].

Available diagnostic modalities include direct abdominal radiography, US, CT, and MRI. Given the use of radiopaque

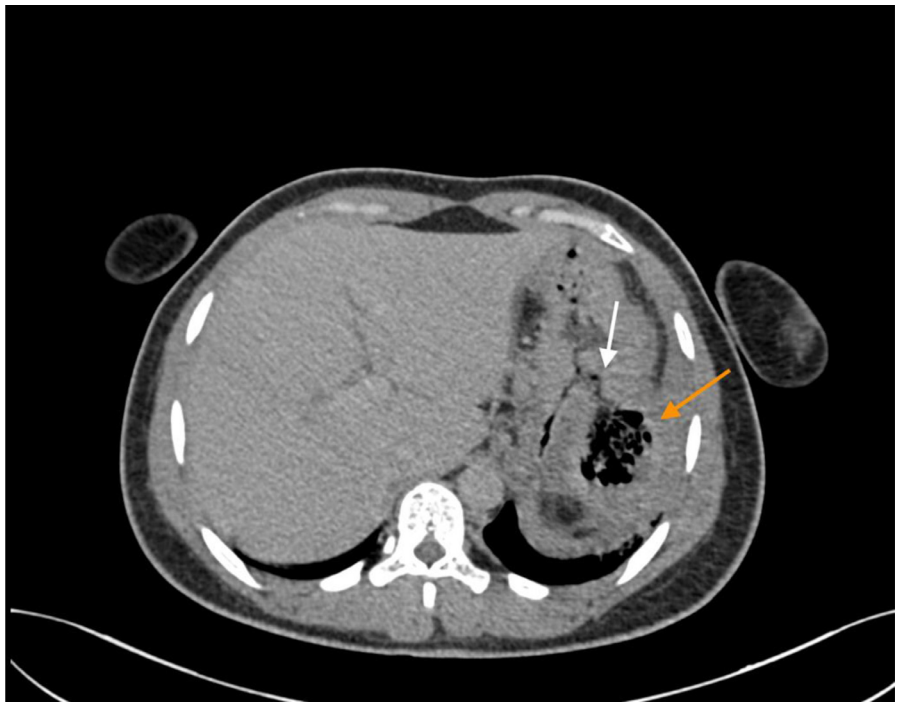

Fig. 2 – Axial CT images showing a mass in the splenectomy bed (orange arrow) with a spongiform appearance and significant infiltration of adjacent fat. This mass communicates with the gastric lumen at the level of the fundus (white arrow).

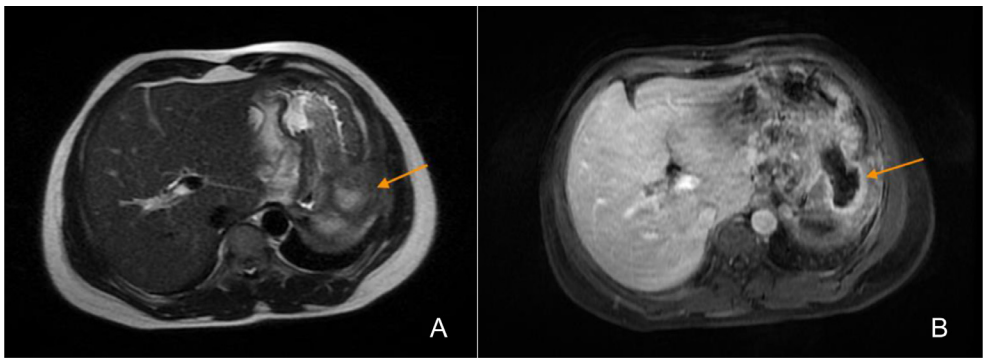

Fig. 3 – MRI demonstrating the mass that shows heterogeneous high signal intensity on T2-weighted images (A) and homogeneous low signal intensity on T1 weighted images with a mildly enhancing wall after injection of gadolinium (B).

sponge markers, a diagnosis can be established through a plain abdominal radiograph. Therefore, if the X-ray reveals a ring-shaped metallic foreign body, the primary consideration should be a retained surgical sponge in a patient with history of a previous surgery [3].

The ultrasound characteristics of abdominal gossypibomas can be categorized into three types: the presence of an echogenic area accompanied by a prominent posterior acoustic shadow; a well-defined cystic mass that contains clearly visible internal hyperechoic, wavy, striped structures; and patterns that are nonspecific, featuring a hypoechoic mass or a complex mass [7].

The pathological changes resulting from the duration of sponge retention and the type of foreign body reaction can lead to various outcomes, including the formation of a pseudotumor with or without abscess, partial absorption of the surgical sponge, or fragmentation of the foreign material into pieces. As a result, ultrasound and CT imaging yield a range of findings. CT imaging might reveal a clearly outlined mass with mixed density, and upon the administration of intravenous contrast material, it may exhibit noticeable and sustained rim enhancement. The mass frequently displays calcification, presenting a wavy, striped, or spotted appearance, and may contain spongiform gas [3]. Air bubbles within a retained surgi-

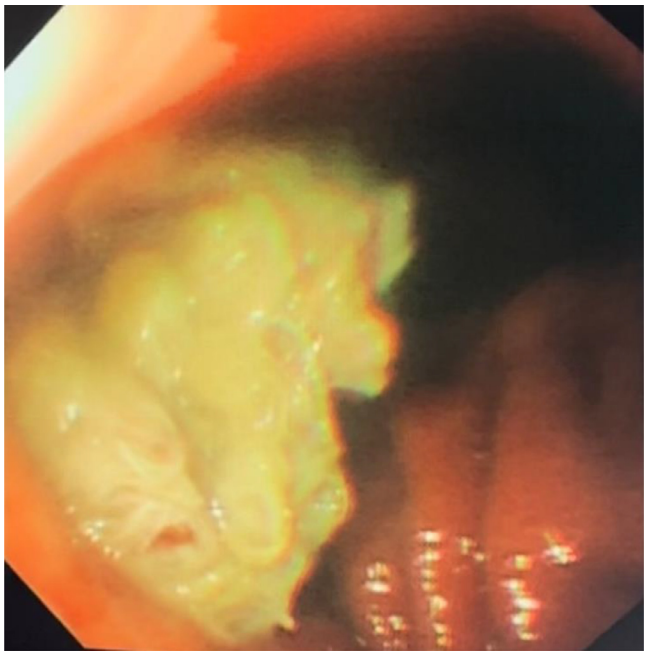

Fig. 4 – An upper GI endoscopic spot image revealing a surgical gas compress protruding partially into the gastric lumen.

cal sponge can arise from various factors, such as perforation or erosion in the intestine, inflammatory reactions or abscess formation, and the entrapment of air between the synthetic fibers of the surgical sponge [4].

The MRI findings further contribute to the characterization of gossypibomas. The central cavity of the lesion demonstrates homogeneous low signal intensity on T1-weighted images and heterogeneous high signal intensity on T2-weighted images. A distinctive feature specific to gossypibomas is the presence of whorled stripes within the central cavity, exhibiting low signal intensity on T2-weighted MRI [5].

Endoscopy has become increasingly valuable as both a diagnostic and treatment approach in the past decade. In cases without complications, such as perforation, fistula, or migration into a luminal organ, conservative management involving clinical and radiological monitoring can be contemplated [5].

The potential differential diagnoses for gossypiboma include faecaloma, haematoma, abscess formation, cyst, or tumor. Faecaloma, although it may have a spotted appearance on CT scans, can be easily differentiated due to the recognizable colonic wall and the absence of a thick, well-defined capsule. Haematoma is typically observed in the early postoperative period, and its radiological diagnosis is straightforward during follow-up examinations by observing the resorption process. Abscess formation is easily diagnosed through clinical and laboratory findings, although determining whether it is secondary to a foreign body in the early postoperative period can be challenging. The presence of whirl-like echogenities on ultrasound or wavy, striped, or spotted high-density areas, along with whirl-like gas on CT examinations, aids in the diagnosis of gossypiboma. Cases mimicking cyst or tumor may be detected in the late period, months or years after surgery, often presenting as asymptomatic or with nonspecific abdominal complaints. Incidental abdominal mass detection during routine check-ups or selfrecognition many years after surgery may lead to hospital admission. It is crucial to consider the possibility of gossypiboma in such cases for accurate diagnosis [7].

Emphasizing prevention over treatment modalities is crucial when dealing with the problem of retained surgical materials. Major risk factors for this occurrence include emergency surgeries, high body mass index, prolonged operations, inexperienced staff, or unexpected changes in surgical procedures. Implementing simple precautions, such as staff education, tagging sponges with markers, and conducting perioperative multiple counts of sponges and materials, can significantly reduce the incidence of gossypiboma [8].

Conclusion

In conclusion, this paper presents a rare case of transmural migration of gossypiboma into the stomach. A retained surgical sponge should be considered if a patient who had surgery in his past medical history presents with abdominal pain and signs of intestinal obstruction, and if an abdominal X-ray shows a metallic, ring-shaped, radiopaque sponge marker. In order to find out whether the surgical sponge has migrated into the bowel, CT imaging is the method of choice to precisely locate the foreign body. In addition, CT imaging helps to rule out intra-abdominal abscess formation and visceral perforation and to judge the extent of the disease.

Patient consent

Written informed consent for the publication of this case report was obtained from the patient.

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