



A Case of Two Abdominal Gossypibomas in a Patient: A Rare Case Report

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Abstract

Gossypiboma is a rare condition caused by retention of a foreign body, most commonly surgical sponge following any surgical procedure. The patient may be asymptomatic, can present with vague symptoms, or rarely with acute symptoms depending on the location of the foreign body and the complications associated with it; thus it may be difficult to diagnose this condition. A 30-year-old woman presented to our hospital with complaints of lump and mild pain on both sides of the lower abdomen for 3 months following caesarean section which was performed in a rural hospital. Ultrasound and computed tomography findings along with the classical history helped in arriving at the diagnosis of two gossypibomas in lower abdomen, one in each flank which was further confirmed on laparotomy.

Keywords

- ▶ abdomen
- ▶ foreign body
- ▶ gossypiboma
- ▶ retained surgical items

Introduction

Gossypiboma or textiloma is a term used to denote a foreign body-like mass of cotton matrix, surgical sponge, or gauze which is mistakenly and unknowingly left behind inside the patient's body during an operation. The term "gossypiboma" is derived from the Latin word *gossypium*, meaning cotton, and the Swahili word *boma*, meaning place of concealment.¹ This term has now been included under the umbrella heading of "retained surgical items (RSI)" which also includes needles, broken instruments, irrigation sets, etc., apart from the formerly mentioned foreign bodies.² The exact incidence of RSI is unknown by the virtue of asymptomatic course in some patients and nondisclosure of such cases owing to the medicolegal complications of the same. However, the reported incidence varies between 1 per 1,000 and 1 per 3,000 procedures.³

The immune system reacts to the presence of foreign body in either of the two ways, exudative and fibrotic/

fibrinous reactions. Exudative reaction involves cytokine and white blood cell interaction, acute and chronic inflammation, and end-stage fibrous capsule development. This may also be complicated by secondary infection which may further result in abscess and fistula formation. The fibrotic/fibrinous reaction is characterized by a foreign body granuloma, adhesions, and encapsulation. Its natural course depends on the type of foreign body reaction. Exudative reaction occurs in immediate postoperative period, presents with acute symptoms, and is therefore detected early. The fibrotic/fibrinous reaction ensues a chronic course with patients remaining asymptomatic for a long period of time and such gossypibomas are detected incidentally. In some cases, gossypiboma may migrate into the intestinal lumen and cause intestinal obstruction. In rare instances, they are further pushed by peristalsis and extruded out of the body by defecation.^{1,4,5}

On account of the varying clinical presentation, the diagnosis of gossypiboma becomes challenging. Therefore,

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imaging plays a key role in the detection and diagnosis of gossypiboma with computed tomography (CT) scan being the investigation of choice for diagnosing gossypiboma and the related complications, if any.¹

Case Report

A 30-year-old woman presented to our hospital with complaints of lump and mild pain on both sides of the lower abdomen for 3 months. It was learned from her past history that she underwent caesarean section 3 months prior to developing these symptoms. Her general examination and laboratory parameters were within normal limits. On abdominal examination, a horizontal scar was noted in lower abdomen and two large masses with smooth surface were palpated in right and left side of lower abdomen. The clinicians put forward the query of hematomas in bilateral flanks based on the history and examination findings.

Ultrasound (USG) of the lower abdomen revealed an anteriorly located curvilinear echogenic stripe with intense posterior acoustic shadowing obscuring rest of the lesion in right lower abdomen. A similar appearing lesion was also noted in left lower abdomen (►Fig 1). Noncontrast and contrast-enhanced CT scans of the abdomen revealed two well-defined heterogeneously hypodense lesions in bilateral lumbar regions measuring 7.1 cm × 6.4 cm × 9 cm (anteroposterior [AP] × transverse [TR] × craniocaudal [CC]) on right side and 5.9 cm × 4.8 cm × 6.9 cm (AP × TR × CC) on left side, showing hyperdense walls, few irregular linear hyperdense areas within the lesions and no postcontrast enhancement (►Fig. 2). No air foci, calcification, or collection was noted. The lesions were surrounded by mesentery and bowel loops on all sides and were seen separate from bilateral ovaries which appeared normal. On MRI, the lesions appeared hypointense on T1WI, heterogeneously hyperintense on T2WI with T2 hypointense wall and few T2 hypointense contents within (►Fig. 3). On the basis of imaging appearances and correlative clinical history, a diagnosis of gossypibomas in bilateral lumbar regions was given. Subsequently on laparotomy, two intraperitoneal masses were detected and excised. Further, dissection of the masses revealed gauze pieces (►Fig. 4). Histopathology of the specimen revealed extensive foreign body giant cell reaction. The postoperative period was uneventful.

Discussion

Gossypiboma, characterized by retention of surgical sponge or swab inside the patient's body, is a known, rare but avoidable complication of any surgical procedure. It is most frequently

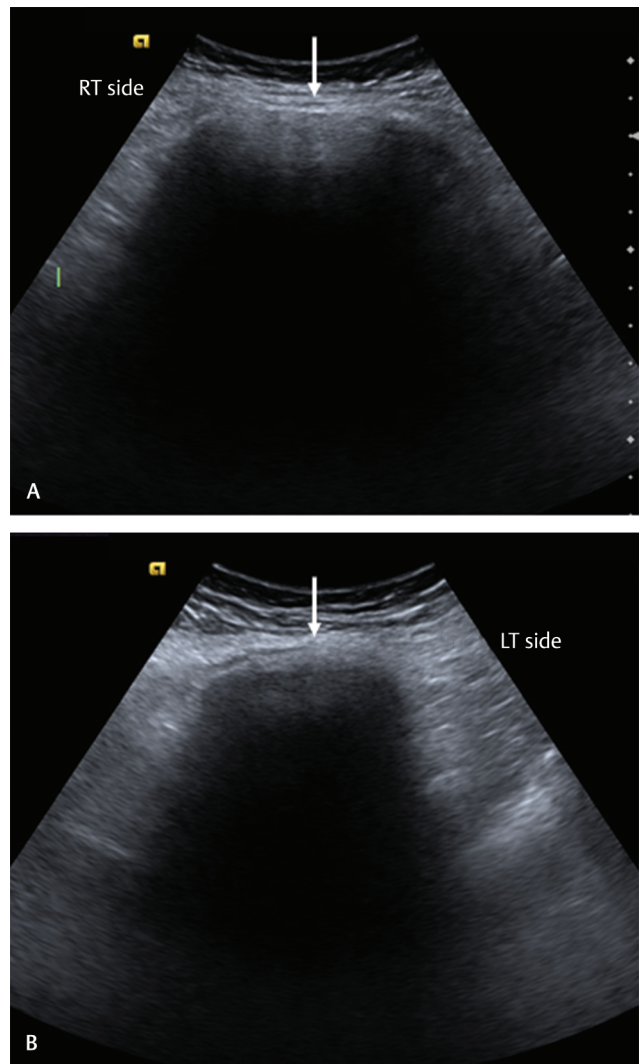


Fig. 1 (A and B) Axial transabdominal sonographic scan of lower abdomen in bilateral flank regions shows curvilinear echogenic stripe (arrow) with intense posterior acoustic shadowing distally, obscuring underlying structures.

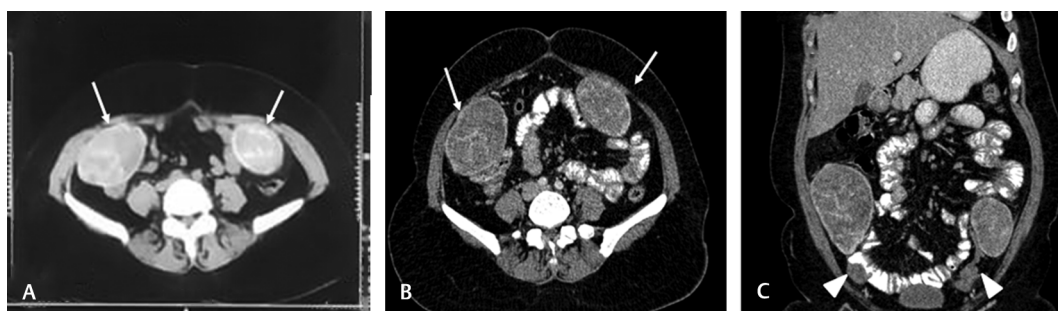


Fig. 2 Axial non-contrast computed tomography: (A) axial (B) and coronal (C) contrast-enhanced computed tomography images of the abdomen show two well-defined heterogeneously hypodense nonenhancing lesions (arrows in A and B) in bilateral lumbar regions measuring 7.1 cm × 6.4 cm × 9 cm (AP × TR × CC) on right side and 5.9 cm × 4.8 cm × 6.9 cm (AP × TR × CC) on left side showing hyperdense walls, few irregular linear hyperdense areas within. However, no air foci are seen within. The lesions were seen separate from bilateral ovaries (arrowheads in C) and are surrounded by mesentery and bowel loops.

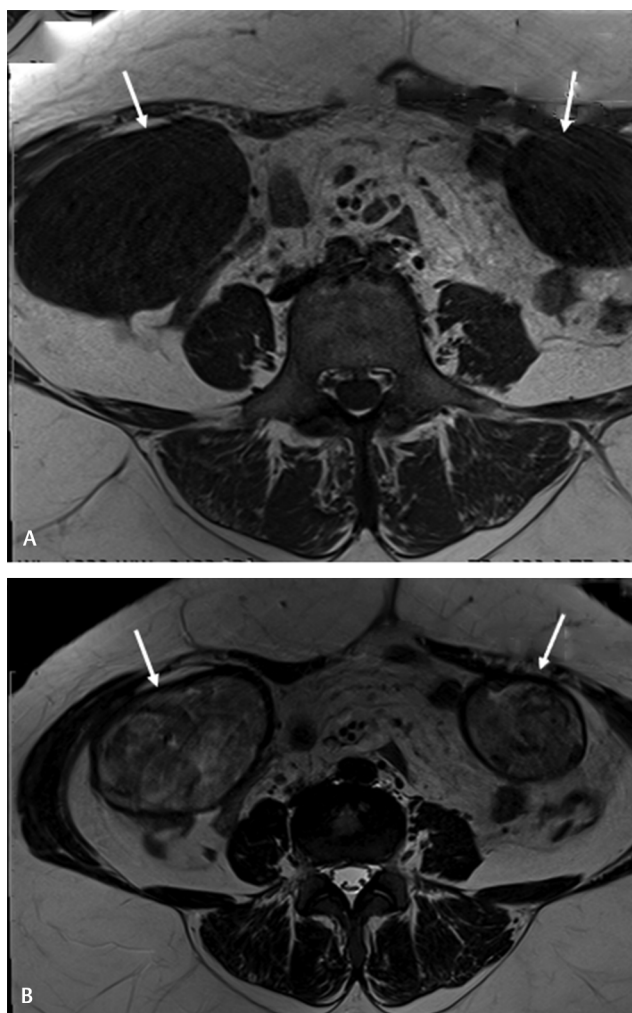


Fig. 3 Axial T1W (A) and T2W (B) MRI images of the lower abdomen show the lesions (arrows) which appear hypointense on T1WI, heterogeneously hyperintense on T2WI with T2 hypointense wall and few linear T2 hypointense contents within, in bilateral lumbar regions. MRI, magnetic resonance imaging; T1WI/T2WI, T1/T2 weighted image.

encountered in emergency surgeries due to sudden change of surgical approach and inappropriate swab count. Other risk factors which have been implicated in causation of this entity include surgeries that involve more than one team, change of nursing staff during surgery, inexperienced staff, more blood loss, hurried surgical count, long operations, and increased body mass index.⁶

Symptoms of gossypiboma can be quite variable ranging from none (incidental detection) to acute presentation and complications depending upon the site of gossypiboma and the type of host reaction to the retained foreign body. The anatomical sites where gossypiboma has been reported includes neck, thorax, breast, axilla, vagina, and paraspinal region apart from abdomen. Acute symptoms of abdominal gossypiboma may range from nonspecific abdominal pain, fever, vague abdominal lump, nausea, vomiting to complications like intestinal obstruction, perforation, gastrointestinal hemorrhage, peritonitis, or septic shock.^{1,7}

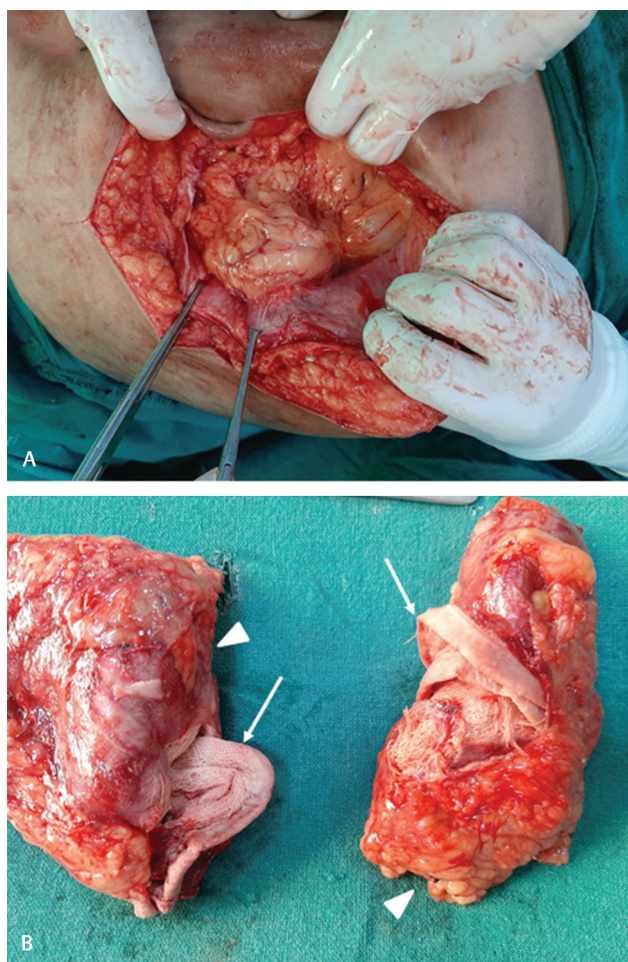


Fig. 4 Intraoperative photograph during laparotomy (A) and surgical specimen (B) after excision and sectioning of the masses reveals gauze pieces (arrows) surrounded by granulation tissue (arrow heads) consistent with a diagnosis of gossypiboma.

Plain radiograph is the first investigation to be done in the postoperative period if the patient complains of pain or other abdominal symptoms. Common appearance of retained surgical gauze on abdominal radiograph includes fine linear radioopacity and associated mottled air lucencies superimposed on this region. The detection of foreign body becomes easier if the sponge contains a radiopaque marker. In case of complications, like intestinal obstruction or perforation, plain radiography reveals dilated bowel loops and pneumoperitoneum. In the presence of a fistula, a contrast study may reveal the location and extent of tract. However, the abdominal radiograph can be absolutely normal and therefore the detection of gossypiboma only on plain radiograph can be difficult.^{1,7}

USG appearances of gossypiboma can vary from poorly defined echogenic area/echogenic anterior stripe with intense posterior acoustic shadowing to a well-circumscribed cystic mass containing internal mottled contents to non-specific pattern, simulating a complex mass. The posterior acoustic shadowing is a consistent sonographic finding and represents a combination of gauze material, air foci, and calcified regions.⁸

CT is the imaging modality of choice for detecting gossypibomas and associated potential complications. The characteristic appearance of gossypiboma on CT is a spongiform pattern with hyperdense linear structures and gas bubbles within. Lu et al⁹ reported “calcified reticulate rind” sign which was described as cystic mass with peripheral rind of calcification exhibiting a reticulate pattern in chronic long standing gossypiboma. This sign aids in diagnosing gossypiboma in chronic cases where the gas bubbles are gradually absorbed. There is another imaging appearance described in the literature comprising of a heterogeneously hypodense mass with a thin hyperdense capsule showing marked post-contrast enhancement.^{9,10}

On MRI, most gossypibomas appear hypointense on T1- and hyperintense on T2-weighted images. However, its appearance may vary depending on the histological composition and fluid content within. On T2-weighted images, it may appear as a soft-tissue mass with high- or mixed-signal intensity with thick well-defined capsule and internal whorled stripes appearing hypointense on T2-weighted images. The peripheral calcifications appear hypointense on T1- and T2-weighted images. It may show peripheral post-contrast enhancement.¹¹

Positron emission tomography (PET)/CT is usually not indicated for gossypiboma. Only few cases of imaging appearance have been reported. Limited literature regarding PET/CT imaging features of gossypiboma reveals low central

radiotracer uptake with high peripheral uptake corresponding to active inflammatory reaction near fibrotic capsule.^{12,13}

The incidence of gossypiboma can be reduced by strict compliance to the precautionary steps like maintaining a meticulous pack count and tagging the packs with markers. There is upsurge in the use of newer technologies like radiofrequency chip identification (RFID) by barcode scanner which is introduced with the purpose of eliminating human errors in the sponge count, and thereby reducing the occurrence of RSI and preventing postoperative complications.¹⁴

Differential Diagnosis

Abdominal gossypiboma needs to be differentiated from other possible pathologies including intra-abdominal abscess, lymphocele, fecaloma, hematoma, and neoplasm. The imaging appearance of these conditions is enlisted in **Table 1**.

Conclusion

Gossypiboma is an uncommon preventable postoperative complication, the occurrence of more than one gossypiboma is very unusual. Owing to the diverse clinical presentation, the diagnosis of gossypiboma can be challenging. In such a scenario, imaging plays a crucial role with CT being the most common imaging modality in the diagnosis of gossypiboma

Table 1 Differential diagnosis of gossypiboma

Differential diagnosis	Radiography	Ultrasound	CT	MRI
Abscess	Ill-defined radio-opacity; air fluid level may be visible	Well-defined cystic lesion with internal echoes, ±air foci	Well-defined, thick walled, peripherally enhancing, fluid density lesion	T1 hypointense, T2 hyperintense lesion; ±T1 hyperintense rim showing postcontrast enhancement; shows restricted diffusion
Lymphocele	±Soft tissue radioopacity	Well-defined anechoic cystic lesion with posterior acoustic enhancement, ±thin septations, debris	Well-defined, thin walled, hypodense fluid containing lesion	Lobulated T2 hyperintense lesion, imperceptible wall showing negligible postcontrast enhancement
Fecaloma	Soap bubble appearance suggesting stool; well-delineated appearance in case of calcified fecolith	Echogenic surface with posterior acoustic shadowing	Intraluminal mass within the colon; spotted or soap bubble appearance; absence of definitive capsule/wall	Hypointense mass on T2WI
Hematoma seen in early postoperative period, progressive resorption in follow up scan	Ill-defined soft tissue opacity; calcification may be seen in old hematomas	Acute: anechoic cystic appearance Chronic: inhomogeneous appearance, septa formation, calcification, hypoechoic fluid areas	Acute: well-defined hyperdense lesion, may show fluid-fluid level Chronic: density and size decrease over time	Acute: Isointense on T1WI; variable hyper- to hypointense on T2WI Chronic: Hypointense on T1WI and T2WI Blooming on T2*GRE
Neoplasm	Ill-defined radioopaque lesion with mass effect	Heterogeneous mass with internal color flow on Doppler study.	Mass lesion with variable enhancement, necrosis, heterogeneity; ±mass effect, infiltration, encasement	Variable intensity pattern on MRI; rest same as CT

Abbreviations: CT, computed tomography; GRE, gradient recalled echo; MRI, magnetic resonance imaging; T1WI/T2WI, T1/T2 weighted image.

and its complications. In the setting of appropriate clinical history and imaging appearances, suspicion of gossypiboma should be raised even if multiple such lesions are seen. Due to the complications and medicolegal implications, strict adherence to the preventive measures is pivotal to reduce the incidence of gossypiboma.

Conflict of Interest

None declared.

References

- 1 Manzella A, Filho PB, Albuquerque E, Farias F, Kaercher J. Imaging of gossypibomas: pictorial review. *AJR Am J Roentgenol* 2009;193(6, suppl):S94–S101
- 2 Gibbs VC. Retained surgical items and minimally invasive surgery. *World J Surg* 2011;35(7):1532–1539
- 3 Hyslop JW, Maull KI. Natural history of the retained surgical sponge. *South Med J* 1982;75(6):657–660
- 4 Anderson JM, Rodriguez A, Chang DT. Foreign body reaction to biomaterials. *Semin Immunol* 2008;20(2):86–100
- 5 Zantvoord Y, van der Weiden RME, van Hooff MHA. Transmural migration of retained surgical sponges: a systematic review. *Obstet Gynecol Surv* 2008;63(7):465–471
- 6 Aminian A. Gossypiboma: a case report. *Cases J* 2008;1(1):220
- 7 Kumar GVS, Ramani S, Mahajan A, Jain N, Sequeira R, Thakur M. Imaging of retained surgical items: a pictorial review including new innovations. *Indian J Radiol Imaging* 2017;27(3):354–361
- 8 Sugano S, Suzuki T, Iinuma M, et al. Gossypiboma: diagnosis with ultrasonography. *J Clin Ultrasound* 1993;21(4):289–292
- 9 Lu YY, Cheung YC, Ko SF, Ng SH. Calcified reticulate rind sign: a characteristic feature of gossypiboma on computed tomography. *World J Gastroenterol* 2005;11(31):4927–4929
- 10 Wan W, Le T, Riskin L, Macario A. Improving safety in the operating room: a systematic literature review of retained surgical sponges. *Curr Opin Anaesthesiol* 2009;22(2):207–214
- 11 Kim CK, Park BK, Ha H. Gossypiboma in abdomen and pelvis: MRI findings in four patients. *AJR Am J Roentgenol* 2007;189(4):814–817
- 12 Yuh-Feng T, Chin-Chu W, Cheng-Tau S, Min-Tsung T. FDG PET CT features of an intraabdominal gossypiboma. *Clin Nucl Med* 2005;30(8):561–563
- 13 Yu JQ, Milestone BN, Parsons RB, Doss M, Haas N. Findings of intramediastinal gossypiboma with F-18 FDG PET in a melanoma patient. *Clin Nucl Med* 2008;33(5):344–345
- 14 Lata I, Kapoor D, Sahu S. Gossypiboma, a rare cause of acute abdomen: a case report and review of literature. *Int J Crit Illn Inj Sci* 2011;1(2):157–160