

## Intraabdominal Gossypibomas with variable CT appearance: A case report

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### Abstract

A retained surgical sponge or gossypiboma is a rare and an underreported complication occurring most commonly after abdominal surgeries. The clinical presentation as well as the time of presentation is variable with about one third of patients being asymptomatic. The diagnosis is challenging because of marked variation in the presentation and imaging plays a crucial role in diagnosis. We report a 30-year old Asian woman with prior history of Caesarean section who presented with persistent abdominal pain since surgery and underwent imaging in December 2012. The case is interesting as she had two intraabdominal gossypibomas with different appearances on computerized tomography. One was suggested to be a retained foreign body while the other was initially misinterpreted as a solid ovarian mass. However, on ultrasound, both lesions showed similar appearance and the left lower abdominal solid mass was also suggested to be a retained foreign body which was then confirmed on laparotomy.

**Keywords:** Gossypiboma, intraabdominal, surgical sponge, computerized tomography, ultrasound.

### Introduction

A sponge or a swab retained inadvertently within the body after a surgical procedure is termed gossypiboma. The word gossypiboma is derived from the Latin "gossypium" meaning "cotton" and Swahili "boma" meaning "place of concealment".<sup>1</sup> It is a rare underreported complication most often after abdominal surgeries, reported incidence is 1/1000 to 1/1500.<sup>2</sup> The duration between surgery and the diagnosis is quite variable. About one third are asymptomatic and the gossypiboma is discovered incidentally.<sup>3</sup> The diagnosis is challenging because of variation in presentation and imaging plays a crucial role. Plain radiography, Ultrasound (US), computerized tomography (CT) scan, and Magnetic Resonance imaging (MRI) are usually employed in diagnostic workup.<sup>4</sup> Often imaging features are typical however

occasionally an alternate diagnosis may be suggested emphasizing the need of utilizing more than one imaging modality. The purpose of presenting this case is to sensitize the physicians and the radiologists with the possibility of more than one gossypiboma and to highlight the fact that different imaging modalities complement each other and help in making a correct diagnosis.

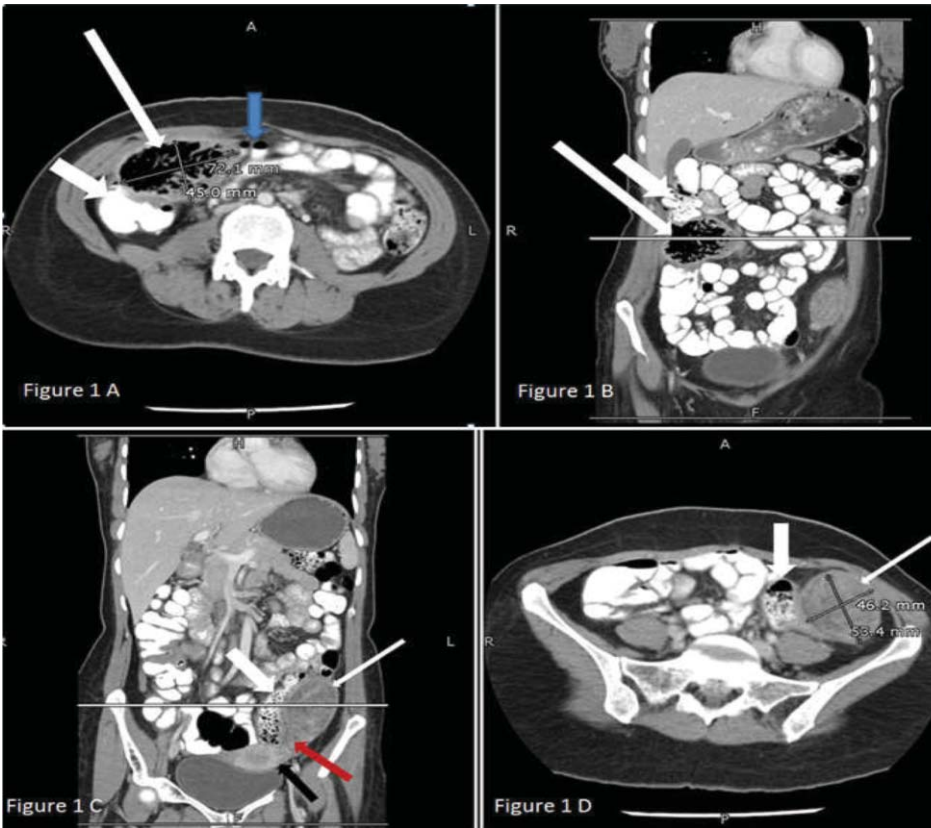
### Case Presentation

A 30-year old Asian woman presented to the surgeon at our hospital in December 2012 with abdominal pain for two months and low grade fever for one month. She had history of Caesarean section (CS) three months back elsewhere. The pain was dull in nature, moderate in intensity and more in the right lumbar region. The fever was relieved by taking antipyretics. She denied nausea, vomiting, constipation or abdominal distension. On examination she was afebrile and had normal vitals. Her abdomen was soft but a vague mass was palpable in the right lumbar region. Pfannenstiel incision of prior CS was noted in lower abdomen. Her baseline investigations revealed mildly elevated white cell count and C-reactive protein.

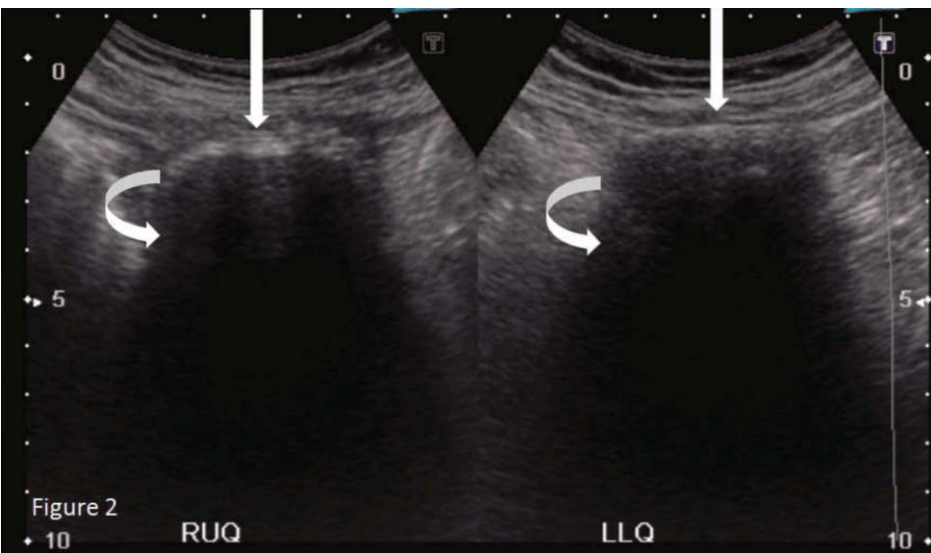
She was referred to the Radiology Department for CT scan which revealed a well-defined oval shaped lesion, measuring 7.2 x 4.5 cm, containing air lucencies in the right mid abdomen abutting the ascending colon, small bowel loops and the left anterolateral abdominal wall (Figure-1, A and B). In keeping with patient's recent history of surgery, the diagnosis of retained foreign body was suggested. Another well-defined, encapsulated somewhat lamellated solid mass without air lucencies was identified in the left lower abdomen inseparable from the left ovary abutting and displacing the sigmoid colon medially (Figure-1, C and D). It measured 5.3x 4.6 cm. This was reported as possible left ovarian solid neoplasm with less likely differential of complex haemorrhagic cyst. No adjacent fat stranding or abdominal lymphadenopathy was seen. The patient presented two days later with increasing abdominal pain in Emergency room (ER) and an US abdomen was performed. On US, both lesions reported on CT had

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**Figure-1:** (A) Axial and (B) Coronal Contrast enhanced CT images at mid abdomen level show a well-defined oval shaped lesion (long straight arrow) containing air lucencies abutting the ascending colon (short straight arrow) and the small bowel ( blue arrow). (C) Coronal and (D) Axial contrast enhanced CT image at lower level show a well-defined, encapsulated solid appearing mass without gas lucencies (long thin white arrow) in the left lower abdomen inseparable from the left ovary( red arrow) abutting and displacing the sigmoid colon (thick white arrow). The black arrow points to the uterus.



**Figure-2:** Ultrasound image of the right upper quadrant (RUQ) and left lower quadrant (LLQ) show mass with echogenic anterior rim(straight thin white arrows) and dense posterior shadowing (curved white arrows).  
 Legend for additional file: Sequence of events in chronological order from the time of admission of the patient to her discharge.

identical appearance. They showed an echogenic curvilinear anterior rim and dense posterior shadowing (Figure-2). Because of their similar appearance, the left lower abdominal mass was also suggested to be retained foreign body. The patient underwent laparotomy. A green colour piece of gauze was found eroding the ascending colon and adherent to small bowel loops in the right upper abdomen. Right hemicolectomy was done with double barrel ileostomy. In the left lower abdomen another white piece of gauze was found adherent to the sigmoid colon which was removed.

Patient remained vitally stable postoperatively and was discharged on fifth postoperative day. She was readmitted electively three months later for reversal of ileostomy which was uneventful.

**Discussion**

First reported by Wilson in 1884,<sup>5</sup> gossypiboma has various synonyms such as "textiloma", "gauzoma", or "muslinoma.". It is often under reported due to medicolegal implications and the exact incidence is not known. The reported incidence is one in 100 to 3000 for all surgical procedures and one in 1000 to 1500 for intraabdominal surgeries.<sup>5</sup> Among the intra abdominal surgeries, gynaecological and gastrointestinal tract surgeries account for 75% of the cases.<sup>6</sup>

Few implicated risk factors are an emergency procedure, an unplanned change in the procedure performed and an

increased body mass.<sup>7</sup>

The time interval between surgery and clinical presentation as well as the symptoms depend on the pathophysiologic response of the body. Gossypiboma induces two types of responses in the body: the exudative and the aseptic fibrinous.<sup>4,8,9</sup> The exudative form results in abscess formation along with external or internal fistula which may cause intestinal obstruction and usually presents early. The aseptic fibrous form induces adhesions and encapsulation resulting in granuloma formation and presents as a mass, being asymptomatic for long period.

Radiology plays a crucial role in preoperative diagnostic workup however the diagnosis is challenging due to wide spectrum of presentation.<sup>7</sup> The patient may undergo imaging because of nonspecific abdominal pain, nausea, vomiting, weight loss or a palpable mass. A variety of imaging modalities are employed in diagnostic workup.

Conventional radiography can detect retained sponges if the sponge contains a radiopaque marker.<sup>4,9</sup> Unfortunately the use of such sponges is inconsistent in our country. Sometimes plain abdominal X ray may show a faint soft tissue density with mottled lucencies due to trapped air or abscess formation which may suggest the diagnosis.

Barium/contrast studies may be helpful in selected cases where fistulous communication with bowel is suspected.<sup>5,9</sup>

US may identify retained even radiolucent foreign bodies.<sup>5,9</sup> Three distinct appearances have been described on US- a) an echogenic area with intense posterior shadowing as was seen in both gossypibomas in our case and that helped in arriving at the correct diagnosis; b) a well-defined cystic mass containing distinct internal hyperechoic wavy pattern in cases where there is exudative response and c) a non-specific hypoechoic or complex mass. The shadowing on US is due to the attenuation of beam by the foreign body/ calcification or due to presence of gas.<sup>4,5,8</sup>

On CT, the most reported feature is a heterogeneous spongiform hypodense mass containing air bubbles with a thick hyperattenuating or enhancing wall. Abscess is the usual appearance. This appearance was seen in the right upper quadrant gossypiboma in our case and is likely due to an exudative response as indicated by presence of fibrino purulent exudate as well as the altered colour of the gauze piece on gross

examination. The solid appearance on CT, as seen in the other gossypiboma in our case, is less commonly reported and cannot be differentiated from a mass lesion.<sup>10</sup> This is likely the result of aseptic fibrinous response of the body. This was supported by no evidence of inflammation on gross examination or change in colour of the gauze piece. It is interesting to note that both types of responses were seen in our case. The similar appearance on ultrasound can be explained by the fact that both air and foreign body cause distal shadowing and cannot be differentiated from each other. Calcification of the wall or reticulate rind sign may also be identified on CT.<sup>5</sup>

On MRI, the appearance varies according to the composition, fluid content and stage. The typical features are a soft-tissue mass with thick well-defined T1 and T2 hypointense capsule having whorled internal configuration on T2-weighted imaging and irregular enhancement inner wall post gadolinium. PET/PET CT is not routinely indicated.

The treatment of gossypiboma is surgical removal, usually by laparotomy. Percutaneous, endoscopic or laparoscopic removal may be attempted in selected cases however dense adhesions and foreign body reaction may preclude it.<sup>5</sup>

Strict use of sponges impregnated with radio opaque markers, careful pack count and thorough postoperative cavity exploration before closure can help prevent this dreadful postsurgical complication.<sup>5</sup>

## Conclusion

Gossypiboma is a rare complication of surgery with multiple gossypibomas being even rarer. It is important to have high index of suspicion while reporting imaging findings in the correct background. Addition of another imaging modality may aid in accurate diagnosis.

This case is being reported in retrospect, patient consent was not obtained, however exemption for ethical approval was obtained from the institute's Ethical Review Committee.

**Disclaimer:** Nothing to declare.

**Conflict of Interest:** None.

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