CASE REPORT

Intrathoracic gossypiboma

Aamir Hameed,¹ Ayesha Naeem,¹ Maimoona Azhar,² Saulat Husnain Fatimi¹¹Department of Cardiothoracic Surgery, Aga Khan University Hospital, Karachi, Pakistan²Department of Surgery, Royal College of Surgeons in Ireland, Dublin, Ireland

Correspondence to

Dr Aamir Hameed,
aamirhameed@hotmail.com

SUMMARY

Gossypiboma refers to retained sponge or swab in any body cavity after surgery. Although it is a rare occurrence, it can lead to various complications which include adhesions, abscess formation and subsequent infections. Gossypiboma occurs as a result of not using radio-opaque sponges, poorly performed sponge counts, inadequate wound explorations on suspicion and misread intraoperative radiographs. Therefore, this event can be avoided if strict preventive measures are taken. Moreover, further complications can be avoided following the correct and early diagnosis of gossypiboma. Gossypiboma is an important topic as it carries great medicolegal consequences for the surgeon. We have presented three cases of intrathoracic gossypiboma following previous cardiothoracic surgeries. They presented years after their surgeries, with features varying from patient to patient, ranging from cough and fever to no symptoms at all. CT scan only showed a mass lesion in all cases, therefore we proceeded for CT-guided biopsy which was also found to be inconclusive. It was only after entering the thoracic cavity via video-assisted thoracoscopy/thoracotomy that the diagnosis was made and sponges were taken out successfully. All our cases recovered with no further complications.

BACKGROUND

Gossypiboma refers to retained sponge or swab in any body cavity. It is a combination of two words: Latin word 'gossypium,' which means cotton and the Swahili word 'boma' which means place of concealment.¹ A surgical sponge, either a laparotomy pad or 4×4 sponge, is the most commonly retained surgical item. A systematic literature review of 254 gossypiboma cases identified via the National Library of Medicine's MEDLINE and the Cochrane Library revealed that gossypibomas appeared most commonly in the abdomen (56%), pelvis (18%) and thorax (11%). Longest reported cases of gossypiboma were found in thorax (43 and 44 years).² There is no clear incidence reported in the literature. An estimated incidence is 1/1000–1/10 000 surgeries.^{3 4}

Although rare, gossypiboma cases do occur, but they are perhaps under-reported due to their medicolegal implications.³ Till now, there is no reported intrathoracic gossypiboma case from Pakistan. However, in a resource-limited setting of a developing country like ours, the occurrence of gossypiboma is much more likely. Therefore, there is a need to discuss these identified gossypiboma cases, their presentation and diagnostic dilemma and, more importantly, to highlight the preventive measures which can be taken to avoid it. Hence, we

document our experience of managing three intrathoracic gossypiboma cases presented at Aga Khan University Hospital, Karachi.

CASE 1 PRESENTATION

A 65-year-old well educated, well-to-do man, with a history of mitral valve replacement for severe mitral regurgitation in 1997 at a hospital in Karachi. Ten years later, he presented with persistent cough.

Investigations

A chest X-ray showed a large circumscribed mass in the right chest.

A chest CT showed a mass of >5 cm involving the anterior and middle mediastinum (as shown by red arrow in figure 1A) highly suggestive of *thymoma or germ cell tumour*.

The serum markers were negative and CT-guided biopsy of the mass was inconclusive.

Differential diagnosis

Thymoma and germ cell tumour.

Treatment

Right-sided video-assisted thoracoscopy (VATS) was performed. When biopsied, multiple strands of swab threads came out in biopsy forceps (figure 1B). VATS was converted to anterior thoracotomy and the entire swab was removed without any complication (figure 1C).

Outcome and follow-up

Postoperative course was unremarkable. The patient was present in the clinic for 6 weeks and was then sent back to his regular physician. His family was agitated and decided to legally follow-up on the case.

CASE 2 PRESENTATION

A 56-year-old man had a CABG (coronary artery bypass grafting) performed in 1999 at a hospital in Karachi. He was diagnosed to have rectal cancer in 2004 and during his metastatic work-up at the time he was found to have an isolated 3 cm mass in the oblique fissure of the left upper lobe of the lung. He underwent abdominoperineal resection for his rectal cancer, leading to complete tumour resection with good margins and negative nodes.

Investigations

Radiological investigations showed an isolated 3 cm mass in the oblique fissure of the left upper lobe (figure 2). This mass was the only abnormality seen in his metastatic work-up. A CT-guided biopsy was carried out but was inconclusive.

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Figure 1 (A) Chest CT showing >5 cm mass involving the anterior and middle mediastinum. (B) Right-sided thoracotomy: white arrow show the retained sponge which appeared to be a mass lesion in anterior and middle mediastinum on radiology. (C) Recovered swab threads.

Differential diagnosis

Metastatic mass.

Treatment

The patient was taken for VATS for wedge resection of this mass for diagnostic and treatment purposes. When the oblique fissure was separated to delineate the mass, multiple whitish yellow thread fibres were identified. This was actually a SWAB which might have been placed for either internal mammary artery harvesting or during hemostasis after the bypass. The swab was completely removed.

Outcome and follow-up

Postoperative course was unremarkable.

CASE 3 PRESENTATION

A 70-year-old man, labourer by profession with a history of CABG at a hospital in Karachi in 1999, presented with a 2-month history of shortness of breath and fever.

Investigations

A chest X-ray and CT scan revealed a cystic mass (as shown by red arrows in figure 3A,B), highly suggestive of thymoma/mesothelial cyst.

CT-guided biopsy was carried out next but was inconclusive.

Figure 2 Chest CT: red arrow showing mass in the oblique fissure of the left upper lobe.

Differential diagnosis

Thymoma and mesothelial cyst.

Treatment

Right-sided thoracotomy was performed. There was a cystic wall (figure 3C) which was opened, and foul smelling necrotic tissue and cotton fibres of retained swab/lap pad were found. The swab was completely removed (figure 3D).

Outcome and follow-up

Postoperative course was unremarkable.

Discussion

Although gossypiboma is quite rare, with a reported incidence of one case per 1000–1500 abdominal operations according to some previous studies, it still presents as an important post-operative complication. It is important to note that gossypiboma can be a complication of any surgery, though it is more likely to occur after laparotomies, emergency cases and long complicated operations involving multiple procedures and surgical teams, in which change in shift of staff may lead to loss of information. However, gossypiboma cases are probably under-reported due to their medicolegal implications.^{3 5}

Patients with gossypiboma are likely to present with pain, nausea, vomiting, cough and a palpable mass. However, a few cases might be totally asymptomatic. Pathologically, the body response to the retained foreign body occurs in one of the following ways: either an aseptic fibrosis response, leading to adhesion to surrounding structures, encapsulation of the foreign body (cotton/surgical swab) and formation of granuloma or an exudative reaction resulting in localised abscess formation. CT is the first diagnostic modality for gossypiboma. A CT scan typically shows well-encapsulated mass, usually of low density, with calcified deposits in between the fragments of retained gauze signifying a 'calcified reticulate rind' sign. Gossypiboma gives a spongiform appearance with gas bubbles, except when it is located in the thorax, when air is resorbed by the surrounding pleura so no gas opacities are seen. Although MRI and biopsy can also be helpful, MRI features can be confusing while biopsy is often inconclusive.^{2 6}

According to a study published in the National Library of Medicine's MEDLINE and the Cochrane Library in which reports from 27 countries were analysed from 1963 to 2008, of a total of 254 cases, the average age at which patient presented was 49 years, the average time to discovery of gossypiboma was

Figure 3 (A) Chest X-ray: red arrow show mass lesion adjacent to the right border of heart. (B) CT of chest: red arrow show cystic mass lesion suggestive of thymoma/mesothelial cyst. (C) Right-sided thoracotomy: per operative appearance of cystic wall of mass lesion. (D) Right-sided thoracotomy: per operative picture of retrieval of retained fibres of swab/lap pad from thoracic cavity.

6.9 years of which 38% cases being discovered with the first year, half of which in turn were discovered within the first 2 months. However, physicians included gossypiboma as a differential diagnosis in only 39% of cases. Moreover, CT was helpful in diagnosis of 61% of cases, followed by radiograph (35%) and ultrasound (34%). Leading signs were pain and irritation (42%), palpable mass (27%) and fever (12%), with obstruction, nausea and diarrhoea in case of abdominal surgeries. Forty-eight per cent of cases had multiple symptoms while 6% were asymptomatic. Common complications of gossypiboma included adhesion in 31% cases, abscess formation in 24% cases and fistula in 20% cases.⁵

Our study includes a total of three cases; the average age at which the patients presented was about 64 years and had different socioeconomic backgrounds. Two patients had a history of CABG while the third had mitral valve replacement. The time interval between the previous operation and patient presenting with symptoms ranged from 5 to 13 years, with an average of 9.3 years. Two patients presented with respiratory symptoms (cough and shortness of breath), while one was asymptomatic on presentation. The CT scan only showed a mass lesion in all cases, therefore we proceeded for CT-guided biopsy which was also found to be inconclusive. It was only after entering the thoracic cavity via VATS/thoracotomy that the diagnosis was made and sponges were taken out successfully. The post-operative course was unremarkable and all patients recovered without any further complications.

Gossypiboma carries great medicolegal consequences. If radio-opaque sponges are not used, then it is much likely to get misdiagnosed as it often radiologically mimics either tumours or abscesses.

This may lead to patient undergoing inappropriate treatment, resulting in morbidity and even mortality. Therefore, prevention is always better than cure, and strict measures should be taken before, during and after the surgical procedure to ensure that no foreign body is left behind within the patient's body.^{5,7}

Swabs should be counted four times, as per the 2005 standards of Association of perioperative Registered Nurses (AORN): first count when the sponges are unpacked, second before closure of any cavity, third as wound closure begins and final count during skin closure. Swab counting policy at our institution is according to the AORN guidelines. Apart from this, hospitals should make a policy to use radio-opaque swabs in surgical procedures so that any retained sponge can be identified on intraoperative and postoperative radiographs, and thus be immediately removed. If gossypiboma is recognised early, removal with minimally invasive approaches can be attempted and further complications can be avoided.

Learning points

- ▶ Radiologically detectable sponges and towels should be used in the surgical site.
- ▶ Careful wound examination should be performed before closing every wound or body cavity for retained surgical instruments according to the international guidelines.
- ▶ Perioperative care nurses should follow strict and well-defined swab counting methods.

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