

Review Article

Gossypiboma neck: a case report with review of literature

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ABSTRACT

Gossypiboma is a dreaded event in surgical expertise. We report a case of post hemithyroidectomy gossypiboma removed 4 years post primary surgery. Initially suspecting it to be a tubercular abscess and fistula, we surprisingly found a surgical gauze on neck exploration. To understand the magnitude of this problem we assembled data on reported gossypibomas post neck surgeries. A detailed search of literature revealed 16 publications (20 cases) with varied clinical picture and differentials. Our case is only the fourth published case wherein there is such a long-standing history and the first to assemble data and review literature on exclusive neck gossypibomas. Although, neck is regarded as a confined cavity with very few obvious crevices where foreign body can be left behind iatrogenically; still, gossypiboma needs to be kept as a differential, especially with a previous surgical history.

Keywords: Gossypiboma, Gauzoma, Surgical negligence, Thyroidectomy, Neck surgery, Surgical sponge

INTRODUCTION

Gossypiboma describes a mass in the body, composed of a cotton matrix (most frequently a surgical sponge), which is surrounded by a foreign body reaction.^{1,2} Presently synthetic material has replaced the cotton, and the term 'textiloma' has also been used in literature. The word 'gossypiboma' is derived from gossypium (Latin), that is, the cotton and the boma (swahili), that is, the place of concealment. A retained cotton matrix inside the body produces a local inflammation on the first day, then a granulomatous reaction after a week and later fibrosis approximately after two weeks.³

Overall incidence of a retained foreign body is about 1:5,500 operations while its incidence post thyroidectomy is rarely reported.⁴ The first published report of a gossypiboma dates back to 1884.⁵ Since then, stringent protocols have been established viz; sponge counting, use of radiopaque sponges, etc; however, such mishaps continue to happen even today.⁶⁻⁸ It is a well-accepted

'never event' of the National Quality Forum of the USA and is also a part of patient safety guidelines issued by the Health Department of the UK.⁹

Gossypiboma is a diagnostic dilemma as the presentation may vary from asymptomatic to a severe life-threatening condition. However, this disorder remains an obscure entity within the medical community and most physicians seldom consider it in their differential diagnosis.^{10,11} The number of published cases possibly correspond to only the tip of the iceberg as there is a disparity in the reported incidence of gossypibomas mainly due to under-reporting.¹² It is also taken as a blemish on the repute of the surgical team as well as the hospital, hence leading to non-reporting of the condition.

We present a case report of a long standing (4 years) gossypiboma of neck and also a review of literature of exclusive neck gossypiboma. In our search for reported cases of gossypibomas following various neck surgeries in English literature, we discovered 20 cases (16

publications) from year 1988 to 2020. Only 3 cases have been published so far with such a long-standing history as in our case; also, only 1 has been published in otorhinolaryngological journals to the best of our knowledge.

CASE REPORT

A 32-years-old female presented to ENT OPD with complaints of a discharging sinus over the anterior neck for 4 years. She had swelling and pain around the sinus for 7 days. There was a history of right hemithyroidectomy 4 years back, elsewhere.

Patient had undergone re-exploration of the wound two months post-surgery in the same hospital where hemithyroidectomy was done, and a (remnant of) silk suture was found intraoperatively which was removed and patient became asymptomatic for a few weeks following which she again developed a discharging sinus. The discharge was initially colourless and non-foul smelling but had become yellow in colour for the past 7 days, and also emitted a foul odour. It was associated with pain.

On examination, there was a horizontal scar mark in the neck, below the level of thyroid cartilage. There was a diffuse swelling near the midline, approximately 1×1 cm, soft in consistency and mildly tender. A sinus at its midpoint with surrounding granulation tissue with purulent discharge was also found. Two level II cervical lymph nodes could be palpated approximately 1.5×1 cm each, which were non-tender and firm.

Patient was euthyroid. CECT neck revealed a heterogeneous soft tissue attenuation area measuring approximately 5.1×3.1×2.6 cm in the visceral space of neck on right side mainly along strap muscles and long lateral aspect of thyroid cartilage. On post contrast study, the lesion showed mild heterogeneous enhancement with

few small non-enhancing areas due to small collection or necrosis within. No evidence of any air pocket seen. There was also a curvilinear sinus tract measuring approximate 3.5 mm in maximum diameter for a length of approximate 3.2 cm with an external opening, and an internal opening in the soft tissue attenuation area in the post-operative thyroid bed. There were also multiple enlarged homogeneously enhancing cervical lymph nodes (Figure 1).

USG guided FNAC showed inflammatory lesion from swelling over scar mark; and reactive hyperplasia of right level II lymph node. Tuberculosis and infected stitch granuloma were kept as differentials. Therefore, under local anaesthesia, the superficial granulation tissue was excised and sent for histopathological examination and TB PCR.

Pus swab was also taken from the discharge which revealed staphylococcus aureus. Histopathology showed features of abscess but no definitive diagnosis was given. TB PCR was also negative. Patient was then taken up for wound exploration under general anaesthesia. Intra-operatively, sinus tract was delineated. Sinus tract was followed and pus was seen in right paratracheal and prevertebral region which was drained.

To our surprise, after drainage of pus, there was a gauze approximately 14×10 cm in the prevertebral space which was frayed, with dense adhesions to adjacent area and carotid sheath. The gauze was dissected free from the attachments and was carefully removed (Figure 2). The cavity was cleaned and irrigated with betadine and saline and surgical site was closed in 2 layers. Post-operative period was uneventful and patient was discharged on day 7 after suture removal.

Her post-operative histopathology revealed inflamed granulation tissue with foreign body reaction (Figure 3). At 10 months follow-up, patient was asymptomatic.

Table 1: Published cases of gossypiboma of neck (arranged chronologically).

Case study	No. of cases	Durati-on of interval	Clinical presentation	Previous surgery	Material removed	Year of publicati on	Diagnosis at the time of detection
Serra et al ³¹	1	2 years	Mass in neck	Laryngectomy and right radical neck dissection	Surgical gauze	1988	Recurrence
Burrel et al ³²	1	6 months	Hard nodule on the left side of her neck	Partial thyroidectomy	Surgical sponge	1999	Calcification of scar tissue
Marcy et al ³³	1	3 months	Swelling left lateral aspect of neck	Pharyngolaryngectomy	Surgical sponge	2005	Gossypibom/ recurrence
Niederker et al ³⁴	1	11 weeks	Incidental	Partial tracheal resection and right modified radical neck dissection for recurrent disease.	Surgical sponge	2007	-

Continued.

Case study	No. of cases	Duration of interval	Clinical presentation	Previous surgery	Material removed	Year of publication	Diagnosis at the time of detection
Tabuena et al ³⁵	1	21 years	Non-productive cough, difficulty in breathing	Tracheal resection and anastomosis for postintubation tracheal stenosis	Surgical gauze (gauze migrated into tracheal lumen)	2008	Bronchial asthma
Amr et al ³⁶	1	8 years	Discharging sinus right side neck	Right submandibular sialadenectomy	Two surgical sponges	2009	Salivary fistula
Falleti et al ³⁷	1	10 months	Respiratory difficulties and bad smell	Radical thyroidectomy	Surgical sponge (migration into trachea causing complete obstruction)	2010	Postoperative granulation tissue, asthmatic bronchitis
Jung et al ³⁸	1	7 months	Mild neck pain	Total thyroidectomy	Surgical sponge	2011	Scar tissue/gossypiboma
Musa et al ³⁹	2	16 weeks, 18 weeks	Non-healing surgical wound with pus discharge	Hemithyroidectomy	Surgical gauze, catgut suture	2012	Abscess with sinus
Polat et al ⁴⁰	3	3 months	Swelling right side neck with	Hemithyroidectomy	Surgical gauze	2012	Secondary infection
		1 months	Discharging sinus Swelling right side neck with discharging sinus Swelling right side	Subtotal thyroidectomy	Surgical gauze		
		2 months	Neck with discharging sinus	Total thyroidectomy	Surgical gauze		
Kim et al ²⁴	1	6 months	Asymptomatic, left supraclavicular mass	Total thyroidectomy with left lat neck dissection	Surgical sponge	2013	Recurrence of malignancy
Korumilli et al ⁴¹	1	1 year	Discharging sinus	Hemithyroidectomy	Surgical gauze	2013	Gossypiboma
Mote et al ⁴²	1	7 days	Swelling, discharge, hoarseness of voice	Hemithyroidectomy	Surgical sponge	2014	Foreign body neck
Pauperio et al ⁴³	1	2 years	-	Total thyroidectomy	Surgical sponge	2014	-
Lohaniet al ⁴⁴	2	4 years	Midline neck swelling with sinus	Hemithyroidectomy	Surgical sponge	2019	Thyroid abscess, thyroid malignancy
		36 years	Right sided neck swelling	Thyroidectomy	Surgical sponge		
Holm et al ⁴⁵	1	2 months	Mass to right of midline in the neck	Total thyroidectomy and central compartment neck dissection	Surgical sponge	2020	Recurrence/remnant

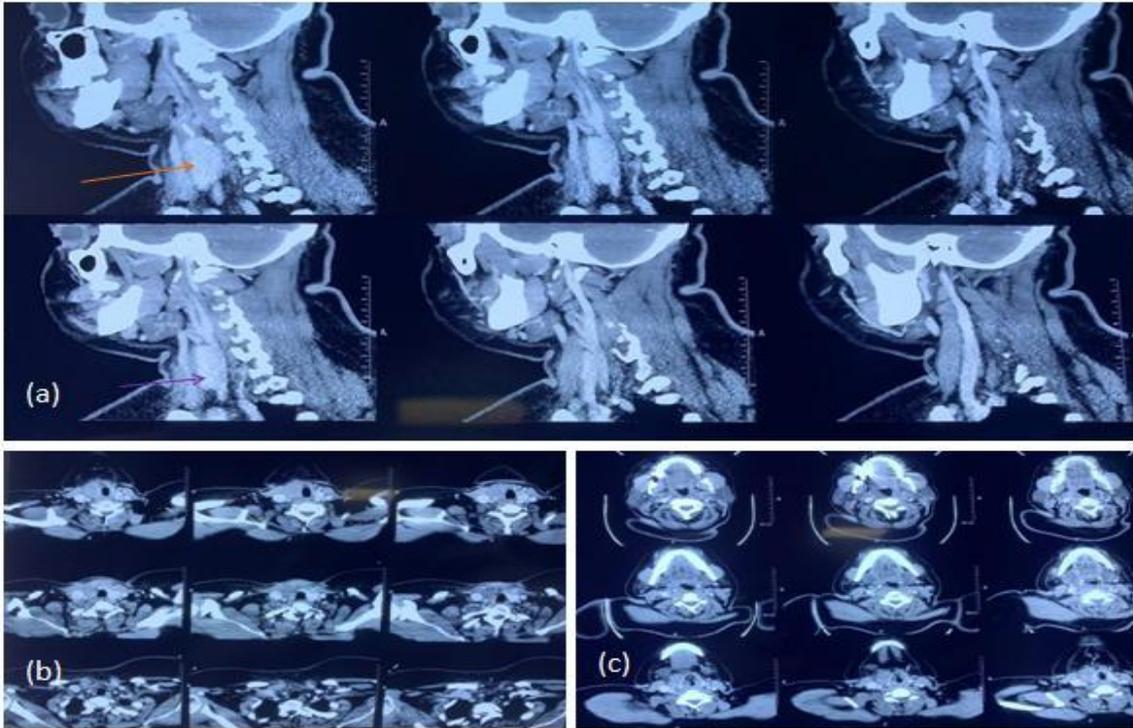


Figure 1: Pre-operative CT neck (a) sagittal section revealed a heterogeneous soft tissue attenuation area (orange arrow) measuring approx. 5.1×3.1×2.6 cm in the visceral space of neck on right side, along lateral aspect of thyroid cartilage. No evidence of any air pocket seen within. It can be seen adherent to the common carotid artery (purple arrow); (b and c) axial view of CECT neck showing the heterogeneous soft tissue attenuation area in the visceral space of neck on right side. On post contrast study, the lesion showed mild heterogenous enhancement with few small non-enhancing areas within-due to small collection or necrosis within.

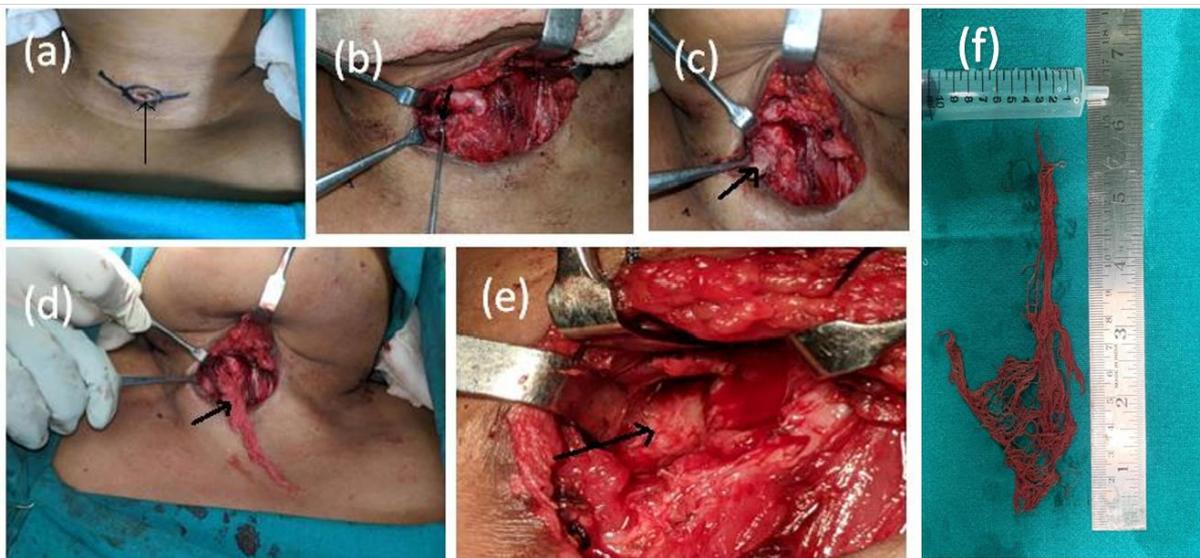


Figure 2: An intra-operative picture depicting (a) surgical incision including discharging sinus with surrounding granulation tissue (black arrow), there is also diffuse swelling in midline of neck with; (b) purulent discharge from right paratracheal region (black arrow) after dissection of the sinus tract. About 5 ml pus was drained; (c) as the dissection continued, surprisingly, a piece of surgical gauze came into view (black arrow); (d) surgical field showing retained surgical gauze in situ, being removed carefully from right prevertebral space (black arrow). It was densely adhered to the adjacent area and carotid sheath; and (e) specimen showing extracted tattered and frayed gauze piece from right paratracheal region.

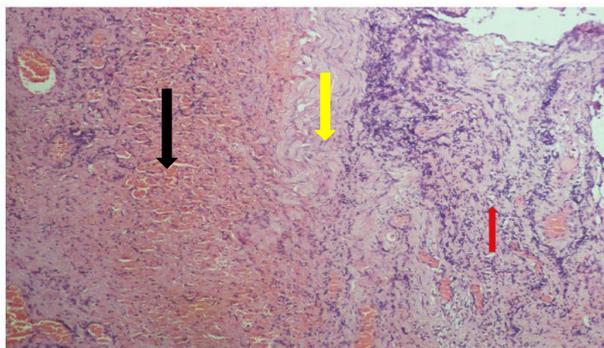


Figure 3: Photomicrograph showing fibro-collagenous tissue with adjacent adipose tissue and muscle bundles exhibiting moderate to dense mixed inflammatory cell infiltrations (red arrow) exhibiting lymphocytes, plasma cells, neutrophils, eosinophils and histiocytes along with dilated blood vessels, focal haemorrhage (black arrow) and fibrosis (yellow arrow) (H and E; at 10X).

DISCUSSION

Gossypibomas are considered a form of surgical negligence, and are mainly reported in major abdominal surgeries.^{4,13} Factors responsible for gossypibomas are mainly related to the type of surgery and the conduct of operating room. Emergency surgeries, lengthy procedures, unexpected change in procedure, multicavity cases, obese patients, shift changes during the surgery, poor communication, false counting of sponges, no clear standardized counting policy and use of non-radioopaque sponges at the end of surgery are among the main risk factors associated with gossypibomas.¹⁴

Cima et al in their large study of 191,168 total surgical procedures in four years, found evidence of 68 different cases of retained foreign bodies in the body as a whole; and reported that majority of the retained foreign bodies were sponges (60%), miscellaneous items (20%), needles (9%) and instrument (3%).⁴ Gossypibomas after neck surgery are a relatively rare event. While there are plenty of publications with abdominal gossypibomas, there is a dearth in literature with regard to exclusive neck gossypibomas literature review.

Pathogenesis

Once retained in the body, surgical gauze acts as a foreign body and induces a strong inflammatory response. The inflammatory response is expressed as either exudative or fibrinous.¹⁵ The nature of the antigenic response is dependent on the antigenic potential of the foreign body and the degree of inflammatory response obtained. A lower antigenicity or a milder inflammatory response leads to a fibrinous response while a higher antigenicity elicits an exudative response. In the fibrinous variety, an infiltrate comprising of polymorphonuclear leukocytes is seen initially followed by a mononuclear infiltrate, which

eventually results in the formation of a foreign-body type granuloma.¹⁶ Chronic inflammation leads to proliferation of fibroblasts, production of granulation tissue and deposition of collagen fibres. A capsule generally forms surrounding the foreign body. There may also be formation of bands and adhesions.¹⁷ Over time, a conglomerate mass is formed and dystrophic calcification can occur within it.¹⁸ In the exudative variety, the inflammatory reaction results in leakage of capillary contents which is followed by an invasion of a mixture of anaerobic and aerobic bacteria and can lead to the formation of a frank abscess.¹⁹ Occasionally, inflammation within the lesion may 'spill over' to an adjacent organ and this can result in the formation of a fistula.

Patients with gossypiboma often have vague clinical presentations and the diagnosis usually comes as a surprise.²⁰ However, there have been reports of asymptomatic gossypiboma as well.^{21,22} Gossypibomas after thyroid surgery commonly present as chronic discharging sinus or lump mimicking malignancy.^{23,24}

Gossypibomas show many radiological manifestations. If the sponge contains a radiopaque marker, the diagnosis can be made easily on conventional radiography.^{25,26} However, radiolucent material such as sponges can cause diagnostic problems. A characteristic sonographic finding of gossypiboma includes a highly echogenic curvilinear structure with dense posterior acoustic shadowing.²⁷ Many authors consider gossypiboma to be specifically indicated by a CT finding of a low-density heterogeneous mass with an external high-density wall that is further highlighted on contrast-enhanced imaging and that has a spongiform pattern containing air bubbles.²⁵⁻³⁰ The present patient had also undergone CT scan but gossypiboma was not kept as a differential due to the presence of an abscess as a confounding factor. This also emphasises the importance of careful surgical evaluation intraoperatively, to prevent missing the retained gauze/foreign body, as had happened in this patient when she was explored 2 months post-surgery in the institute where primary surgery had been done. With diverse clinical features and varied imaging findings, the diagnosis of gossypiboma can be tricky.

Thus, gossypibomas should be kept in mind as a differential diagnosis for neck masses, particularly with a history of previous surgery. An extensive literature search of Pubmed and Medline databases was performed for articles published upto February 2021, to assess the neck masses/ fistulas/sinuses that were finally discerned as gossypibomas. Stitch/suture granulomas were excluded. Studies where details of case report was not given and included as a part of large case series were also excluded. No language restrictions were applied, and reference lists of all included studies were manually searched for other potential eligible studies. We identified 16 published case reports of neck gossypibomas.

Review of literature

Table 1 shows chronologically arranged various studies in which a diagnosis of neck gossypiboma was established. As evidenced by the table, suspicion of gossypiboma was very low in majority of the cases. In our case too, our primary suspicion was tuberculosis, which is widely prevalent in a developing country like India. If operated for malignancy, recurrence/residual tumour is the primary diagnosis. Thus, not only does it cause significant morbidity but also causes mental agony to the patient. In the neck, there is no obvious cavity like the abdomen; however, few potential spaces do exist. The most common surgical procedure was found to be thyroidectomy. In two cases, the gauze had migrated to tracheal lumen and had caused death in one. Usually, the diagnosis was made within one year, but in a few cases, there was a long history between previous surgery and the diagnosis, just like in our case. These cases give an insight as to the incidence and presentation of gossypibomas in the neck, and we believe, would help surgeons in future to keep gossypibomas as a differential when dealing with neck masses/ sinuses post neck surgery, thus decreasing the associated morbidity. Also, future surgeons would be more careful even in neck surgeries to minimize the incidence of gossypibomas.

Diagnosis of neck gossypiboma can be easily delayed or even missed, especially if it occurs in a clinical setting where the patient had been operated for a tumour/carcinoma previously. Pre-operative CT may not always give an accurate diagnosis especially when confounding factors like an abscess, post-operative scar tissue/oedema, etc is present. The knowledge about this easily preventable event can help surgeon in making differential diagnosis and hence deciding the treatment. Varying presentations of neck gossypibomas have been highlighted in the review of literature. Gossypiboma should be included in differential diagnosis if a previous neck surgery has been performed, even if the duration when the initial surgery was performed is long, as evidenced by this case. For any patient, a primary surgery in itself is taxing- physically, mentally as well as financially, more so in developing countries; but to suffer from ill-effects of this 'never event' as well as a second surgery is unacceptable. Thus, surgeons performing neck surgery should be mindful of ensuring that no foreign body is inadvertently left behind.

CONCLUSION

Safety of the patient is of utmost importance and safe surgical practice should be scrupulously followed. Safer working health system is the cornerstone for decreasing medical negligence. Here, we have given the assemblage of exclusive neck gossypiboma which gives a better understanding of incidence of these events in neck cases, hence, the surgical sponge count should bear importance even in a small cavity such as neck. Also, this report is unique as there is a prolonged history before the diagnosis was made, which has been published in only 3 such cases,

thus highlighting the importance of gossypiboma as a differential. We also emphasize that every hospital needs to develop a strict protocol to decrease such incidents which should be a 'never event'.

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