IJBPAS, June, 2019, 8(6): 1189-1199

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

GOSSYPIBOMA: RADIOLOGICAL DIAGNOSIS AND CHALLENGES- A CASE REPORT AND REVIEW OF LITERATURE

AWAJIMIJAN NATHANIEL MBABA (FWACS)[1], MICHAEL PROMISE OGOLODOM (MSc)[2]. RUFUS ABAM (FWACS)[1] AND CHIDINMA WEKHE (FWACS)[1]

[1]Department of Radiology, Rivers State University Teaching Hospital,

Port Harcourt Rivers State, Nigeria

[2]Rivers State Hospitals Management Board, Port Harcourt Nigeria

***Corresponding Author: Michael Promise Ogolodom: E Mail: mpos2007@yahoo.com**

Received 2nd Jan. 2019; Revised 25th Jan. 2019; Accepted 2nd Feb. 2019; Available online 1st June 2019

https://doi.org/10.31032/IJBPAS/2019/8.6.4744

ABSTRACT

Gossypiboma is a preventable surgical complication with grave medico-legal implications. It refers to a mass of surgical cotton sponge inadvertently left in body cavity of a patient during surgery. It is a major surgical error which may lead to considerable morbidity and mortality. The radiologists play key role in the diagnosis of gossypiboma and confirmation of diagnosis through feedback is vital to the improvement of radiological knowledge. We present the case of a post-myomectomy woman whose abdominal computed tomography scan revealed a mass suggestive of gossypiboma, to discuss typical Computed Tomography(CT) imaging findings and to emphasize the need for exchange of information (in the form of feedback) between the radiologists and the surgeons to promote mutual diagnostic shrewdness and as well enhance their confidence. In this manner the overall care of the patient may be improved.

Keywords: Computed tomography, gossypiboma, radiological diagnostic challenges

INTRODUCTION

Gossypiboma was first described by Wilson in 1884 AD. [1-3]. It is a word used to denote accidentally or unintentionally retained surgical cotton sponge or towel in the body of a patient following surgery [4]. These retained sponges were initially called

"textilomas," but were renamed "gossypiboma" in 1978[5] The term gossypiboma is a bilingual word comprising of a Latin word "gossypium" meaning cotton and "boma" a Swahili word meaning "a place of concealment" [6,7,8]. Gossypiboma is also known by other terminologies such as textiloma, guazoma, muslinoma and cottonoids.

It is a preventable but grave surgical error with medico-legal consequences.[9] It may lead to considerable morbidity and mortality and is responsible for about 50% of malpractice claims for retained foreign bodies [10,11]. Nevertheless, its frequency of occurrence is unknown due to under reporting for fear of litigation. The reported frequency of occurrence in literature is one in every 3000 to 5000 abdominal operations and the most frequent site is the abdomen[12,13] with a mortality rate of about 10% to 18%[14,15]. Report also shows that women are more prone to having gossypiboma [16].

Different surgical objects can be retained in the abdominal cavity during the course of a surgical procedure. These may include surgical sponges or gauze, towels, artery forceps or pieces of broken instruments, irrigation sets and rubber tubes [17]. The reported incidence of retained foreign bodies such as sponge, needle or part of instrument following surgery is about 0.01% to 0.001%, of which gossypibomas constitutes about 80% of cases [6].

Gossypiboma can be anywhere in the body. Wan, et al [18] in a review of 254 cases of gossypiboma reported that the most predominate location is in the abdomen (56%), followed by pelvis (18%) and then thorax (11%). They can also be found in the extremities, CNS and breast [19-21].

Gossypiboma produces two types of biological responses in the body: exudative and aseptic fibrous. Aseptic gossypibomas can have adhesions, encapsulation, and eventually granuloma formation. Exudative gossypibomas normally occur early in the postoperative period and may involve secondary bacterial contamination, which can lead to fistulas formation [22, 23].

The fate of gossypiboma depends on the type of biological response. It may present at any time, from early postoperative period to several decades after initial surgery [24]. In a few cases, retained sponges may destroy the walls of viscera and migrate into the intestinal lumen due to pressure necrosis and granuloma formation and may be further propelled by peristalsis [25]. Several documented cases of spontaneous transmural

migration of gossypibomas and expulsion by defecations have been published [26].

Numerous risk factors that favour gossypiboma have been suggested [13] and they include emergency surgery [27], long and difficult procedures, especially those with nursing and personnel change, team fatigue, unexpected change in the type of surgical procedure, haemorrhagic procedures and obesity (large intra-peritoneal space where sponge can be left behind and increased technical difficulty). In developing countries, power outages are major challenges [28] and especially when it occur during emergency operations [29].

Clinical presentation of gossypiboma is imprecise making early diagnosis difficult [13]. Patients may present with abdominal pain, fever, vague abdominal lump, nausea, vomiting, abdominal wound discharge, or sepsis [30]. Patients can also present with complications arising from gossypiboma such as intestinal obstruction, perforation, gastrointestinal hemorrhage, peritonitis, or septic shock [25]. Some may remain sterile and encapsulated with no symptoms for years, being of little harm to the patient [31, 32]. An uncommonly reported possible complication of a retained surgical sponge is the development of an angiosarcoma [33].

The diagnosis of gossypibomas may be extremely challenging for the radiologist because of variable clinical presentation and lack of classical radiological imaging findings. A high index of suspicion may be required especially in any post operative patient who presents uncommon manifestations. Investigation has shown that gossypiboma is best diagnosed with CT, followed by conventional radiography and then ultrasonography [18]. Other imaging techniques for the diagnosis of gossypiboma include MRI, barium enema and PET-CT. Improving quality of healthcare services rendered to our patients is becoming the predominant theme of this era, the need to redefine interdisciplinary relationship among care givers has never been this important. The aim of this work is to report a case of gossypiboma to describe CT imaging findings and diagnostic challenges as well as to call for understanding and mutual trust among radiologists and other medical disciplines to improve radiological services in our setting.

CASE REPORT

Abdominal CT scan was performed on a 35 year old woman who presented with a 2-week history of myomectomy with mesenteric injury, abdominal swelling, increasing abdominal pain and fever. The

scan revealed a thick-walled, roundish, well-encapsulated low-density heterogeneous mass with a spongiform pattern containing central air bubbles in the left lower abdominal quadrant. Mass measures 11.78cm x 11.95cm x 11.87cm (anterioposterior x transverse x craniocaudal diameters). This CT finding is suggestive of gossypiboma (Figure 1a, 1b and 1c). In view of the fact that, the reported CT appearances of gossypiboma are not pathognomonic and most often they are imprecise, we made several attempts to get feedback from the surgeon to confirm our diagnosis but the surgeon was evasive.

Fig. 1a: Non-contrast axial CT of the abdomen showing an intra-abdominal gas containing mass (gossypiboma) in a 35-year-old woman with a prior history of myomectomy who presented with abdominal swelling, increasing abdominal pain and fever. (arrows)

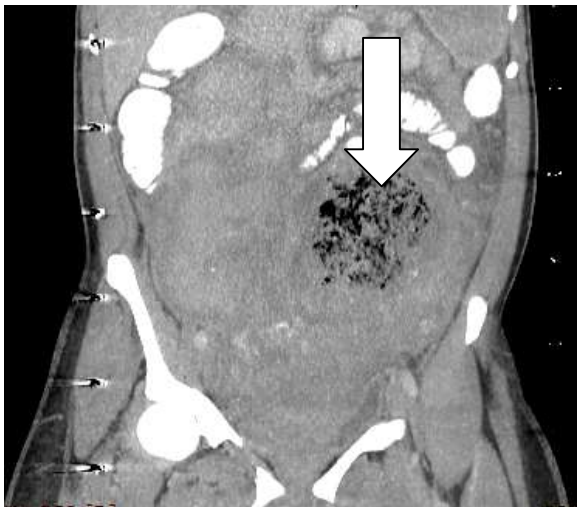

Fig. 1b: Contrast enhanced coronal CT of the abdomen showing an intra-abdominal gas-containing mass (gossypiboma) in a 35-year-old woman with a prior history of myomectomy who presented with abdominal swelling, increasing abdominal pain and fever (arrows)

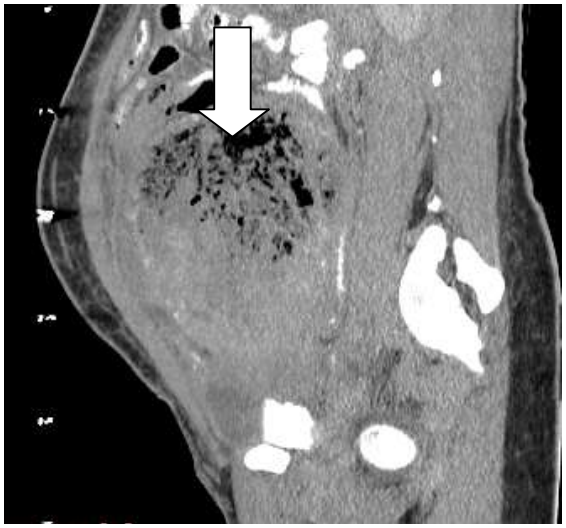

Fig. 1c: Contrast enhanced sagittal CT of the abdomen showing an intra-abdominal gas-containing mass (gossypiboma) in a 35-year-old woman with a prior history of myomectomy who presented with abdominal swelling, increasing abdominal pain and fever.(arrow)

DISCUSSION

Gossypiboma or textiloma is a non-absorbable surgical material with a cotton matrix around which a foreign body reaction occurs. The term gossypiboma may be new to some health workers but has been in use for long [34]. It is an uncommon surgical error with medico-legal consequences. The true frequency of occurrence of this condition may be difficult to ascertain as surgeons may not report these events for fear of litigation and adverse publicity. This probably may be the reason we were unable to confirm our diagnosis from the surgeon that was managing the patient being reviewed. In a similar report on the reasons for the under-reporting of gossypiboma in a third-world country like Nigeria, Erabor [29], ascribed some of these reasons to socio-cultural factor. He asserted that when a patient is re-operated upon because of uncommon symptoms after laparotomy and a retained pack is found, the unwritten rule is that "it was never there". As such, that information never enters the operation notes or the operations register. Everyone in theatre agrees (via an unwritten rule) that such information must not leave the theatre in order to protect the reputation and professional integrity of a colleague. Therefore, the chief perpetrator never gets to realize his/her mistake and when, out of inquisitiveness, he asks about the operation findings, he/she is usually told that an organized abscess was found. This is the magnitude of concealment of information pertaining to gossypiboma and is a major challenge to the development of radiological practice in the third world like ours. The radiologists cannot easily get feedback to

confirm his/her suspicion in not-straightforward cases like that of a gossypiboma.

Although a history of an inaccurate sponge count may be lacking, gossypiboma is considered a strong diagnostic possibility in postoperative patients presenting with unexplained symptoms such as pain, abdominal mass and intestinal obstruction. The patient being reviewed presented with abdominal mass and pain following a myomectomy. Similar presentation has been reported by Mohinder et al., [35] in a case report on migratory surgical Gossypiboma as a cause of iatrogenic perforation. They enumerated the prevalence of the leading signs and symptoms as pain/irritation (42%), palpable mass (27%) and fever (12%).

Wan, et al., [17] in their study reported that, the abdominal cavity is the most predominate site for retained surgical sponge, followed by pelvis, and then thorax. In the case under review the suspicious foreign body was diagnosed in the abdomen.

The Computed tomography is the modality of choice for detection of gossypiboma and possible complications. CT characteristically shows a low-density heterogeneous mass with a spongiform pattern containing central air bubbles and an external high-density wall that is further highlighted on contrast-enhanced imaging., [15, 22, 23]. Characteristic feature of gossypiboma in chronic cases includes a rim of calcification around a reticular mass giving the "calcified reticulate rind" sign has been described in a report by Lu et al., [36]. Based on the characteristic CT imaging features of gossypiboma in early post operative period and clinical history, the case under review was diagnosed as gossypiboma.

A gossypiboma produce two different types of reaction. There is an exudative reaction which leads to the formation of abscesses, and there is also a fibrotic reaction which leads to adhesions and mass lesions. Exudative response normally occurs early in the postoperative period and fibrotic reaction may remain silent for years. Our patient presented 15 days post-operatively with unusual abdominal complaints.

Our patient is a female and underwent a gynaecological surgery. This is similar to the reports of studies conducted by Terkimbi et al., (37), Dane et al (38), Rappaport and Hayness (14) and Gawande et al., (15). In Terkimbi et al study, they reported a higher incidence of retained laparotomy sponges in association with gynecological procedures. Gawande et al., [15] also reported that mistakes in tool and sponge counts occurred in 12.5% of surgeries. Rappaport and

Hayness (14) reported that females have a higher incidence of retained foreign body during surgery. It has also been documented by Dan et al., (38) that cotton pads, towels and sponges are usually used to control bleeding and occasionally for packing the paracolic gutters during gynaecologic surgeries.

The differential diagnoses of gossypiboma are numerous, which includes faecaloma, hematoma, abscess formation and tumour. Faecaloma may have a spotted appearance on CT but has a recognizable colonic wall and lacks thick well-defined capsule. Hematoma is usually observe in the early postoperative period and shows resorption in follow-up investigation.

CT findings of an intra-abdominal abscess may be indistinguishable from gossypiboma [39, 40]. An abscess is visualized as a mass of fluid density and has a well- defined enhancing wall. Gas within it gives an air-fluid level rather than the spongiform pattern characteristic of gossypiboma. Conversely, abscess formation can occur as a complication of gossypiboma formation. Gossypiboma mimicking tumour is usually detected as a palpable abdominal mass in a patient who is asymptomatic or has an imprecise abdominal complaints with a past history of laparotomy. This condition must be taking into consideration to proper diagnosis.

The diagnosis of gossypiboma depends on demonstration of characteristic CT appearance in a patient with a history of previous surgery that is either recent or far-off. The possibility of a retained foreign body should always be taken into consideration in the differential diagnosis of any post-operative patient who present with pain, infection or palpable mass [41].

The diagnosis and confirmation of diagnosis of gossypiboma may be challenging to the Radiologist especially in our setting where information on retained foreign body is not discussed outside the operating theatre. In an effort to protect the reputation and professional integrity of a colleague, the surgeons engage in an “unwritten rule” not to take such information beyond the theatre. The magnitude of this cult-like loyalty and concealment of information pertaining to gossypibama is such that the primary surgeon is even not trusted and does not even get to realize his/her mistake. The radiologists cannot easily get feedback to confirm his/her suspicion in not-straightforward cases like that of a gossypiboma. In our case our diagnosis remains tentative since we were unable to confirm it probably for fear of breaking an unwritten theatre rule by the

surgeons. This is a major setback to the radiologists and a challenge to the development of radiology in the third world like ours. It is a well known fact that a system with effective teamwork can improve the quality of patient care and reduce workload among healthcare professionals [42].

CONCLUSION

Gossypiboma is a known medical error and will continue as long as man remains fallible. Non-disclosure of medical error to patients is not ethically justified and worse still when a colleague is left unapprised. Given the fact that all medical personnel work in synergy for the advancement of medical knowledge and improvement of patients' care, information on medical errors should be made known to colleagues especially when such information is requested. In this manner everyone will learn from his/her mistakes and make amendments where necessary. Awareness of this problem among surgeons and radiologists is essential to avoid unnecessary morbidity and mortality. The cocoon of the "place of concealment" should be shattered to boost team work and promote interdisciplinary relationship with concomitant improvement of healthcare services in our environment.

REFERENCES

[1] Iglesias AC, Salomão RM. Gossipiboma intra-abdominal - análise de 15 casos. Rev Col Bras Cir. 2007; 34: 105-13.

[2] Mafalda LG, Caitano MJC, Magioni FM, et al. Textiloma simulando tumor de cólon e mesentério, assintomático durante 40 anos. ABCD Arq Bras Cir Dig. 2009; 22: 186-7.

[3] Lauwers RP, Van Hee RH. Intraperitoneal gossypibomas: the need to count sponges. World J Surg 2000; 24: 521–527

[4] Rajagopal A, Martin J; Gossypiboma – A Surgeon legacy report of a case and review of literature. Dis Colon Rectum, 2002; 45:119120.

[5] Williams RG, Bragg DG, Nelson JA (1978) Gossypiboma—the problem of the retained surgical sponge. Radiology 129:323–326

[6] Kim HS, Chung IS, Suh SH, KIim SY; MR imaging findings of paravertebral gossipyboma. AJNR Am J Neurodiol, 2007; 28 (4): 709-13

[7] Jain M, Jain R, Sawhney S. Gossypiboma: ultrasound-guided removal. J Clin Ultrasound 1995; 23:321–323

[8] Rajput A, Loud PA, Gibbs JF, et al. Diagnostic challenges in patients

with tumors: case 1. Gossypiboma (foreign body) manifesting 30 years after laparotomy. J Clin Oncol 2003;21:3700–01

[9] Jebbin NJ, Adotey JM; Gossypiboma-a report of 2 cases. Nigerian journal of medicine,2006:15,87-88

[10] O'Connor A, Coakley F, Meng M, Eberhardt S. Imaging of retained surgical sponges in the abdomen and pelvis. AJR 2003; 180: 481 –489

[11] Gencosmanoglu R, Inceoglu R. An unusual cause of small bowel obstruction: gossypiboma—case report. BMC Surg 2003; 3:6

[12] Kiernan F, Joyce M, Byrnes CK, O'Grady H, Keane FB, Neary P. "Gossypiboma: a case report and review of the literature". Ir J Med Sci 177 (4): 389–391. 5.

[13] Manzella A, Filho PB, Albuquerque E, Farias F, Kaercher J. "Imaging of gossypibomas: pictorial review".AJR Am J Roentgenol 2009; 193 (6 Suppl): S94–101.

[14] Rappaport W, Haynes K. The retained surgical sponge following intra-abdominal surgery. A continuing problem. Arch Surg. 1990; 125: 405-7.

[15] Gawande AA, Studdert DM, Orav EJ, et al. Risk factors for retained instruments and sponges after surgery. N Engl J Med. 2003; 348: 229-35.

[16] Botet del Castillo FX, López S, Reyes G, Salvador R, Llaurado JM, Penalva F, et al. Diagnosis of retained abdominal gauze swabs. Br J Surg. 1995; 82: 227–8.

[17] Ketan VK; Medical Science Gossipyboma: A diagnostic challenge but a surgeon's nightmare. Indian Journal of applied research, 2014(4):4

[18] Wan W et al. Improving safety in the operating room: a systematic literature review of retained surgical sponges. Curr Op Anesthesiology 2009: 22: 207-214

[19] Kominami K, Fujikawa A, Tamura T, Naoi Y, Horikawa O. Retained surgical sponge in the thigh: report of the third known case in the limb. Radiat Med 2003; 21: 220–222

[20] Ebner F, Tolly E, Tritthart H. Uncommon intraspinal space occupying lesion (foreign-body granuloma) in the lumbosacral

region. Neuroradiology 1985; 27: 354–356

[21] El Khoury M, Mignon F, Tardivon A. Retained surgical sponge or gossypiboma of the breast. Eur J Radiol 2002; 42:58 –61

[22] Kim CK, Park BK, Ha H. Gossypiboma in abdomen and pelvis: MRI findings in four patients. AJR 2007; 189:814–817

[23] Choi JW, Lee CH, Kim KA, et al. Transmural migration of surgical sponge evacuated by defecation: mimicking intraperitoneal gossypiboma. Korean J Radiol 2006: 7: 212–214

[24] Ribalta T, McCutcheon IE, Neto AG, et al. Textiloma (gossypiboma) mimicking recurrent intracranial tumor. Arch Pathol Lab Med 2004; 128: 749 –758

[25] Ranjan R, Nityasha N, Anubhav P, Arya K, Mishra N. Transvisceral migration of gossypiboma presenting as gastric outlet obstruction managed endoscopically. Int Surg J. 2016; 3: 1663–5.

[26] Zantvoord Y, van der Weiden RMF, van Hooff MHA. Transmural migration of retained surgical sponges: A systematic review. Obstet Gynecol Surv. 2008; 63: 465–71.

[27] Mefire, A.C., Tchounzou, R., et al. (2009) Retained sponge after abdominal surgery: Experience from a third world country. The Pan African Medical Journal, 2, 10.

[28] Bamgboye, E.L. (2003) Hemodialysis: Management problems in developing countries, with Nigeria as a surrogate. Kidney International, 63, S93-95. doi:10.1046/j.1523-1755.63.s83.19.x

[29] Irabo D. O. Under-reporting of gossypiboma in a third-world country. A sociocultural view, Health 2012. Vol,4, No.2, 56-59. http://dx.doi.org/10.4236/health.2012.42010

[30] Chopra S, Suri V, Sikka P, Aggarwal N. A Case Series on Gossypiboma-Varied Clinical Presentations and Their Management. J Clin Diagn Res. 2015; 9: QR01–3.

[31] Stawicki, S.P., Evans, D.C., et al. (2009) Retained surgical foreign bodies: A comprehensive review of risks and preventive strategies.

Scandinavian Journal of Surgery, 98, 8-17.

[32] Cima, R.C., Kollengode, A., Garnatz, J., Storsveen, A., Weisbrod, C. and Deschamps, C. (2008) Incidence and characteristics of potential and actual retained foreign object events in surgical patients. Journal of the American College of Surgeons, 207, 80-87. doi:10.1016/j.jamcollsurg.2007.12.047

[33] Haaga JR, Boll D. CT and MRI of the whole body. Mosby. (2009) ISBN: 0323053750.

[34] Malik A, Jagmohan P. Gossypiboma: US and CT appearance. Indian J Radiol Imaging. 2002; 12: 503-4.

[35] Mohinder K. Malhotra. Migratory surgical Gossipiboma- cause of iatrogenic perforation: case report with review of literature. Nigeria Journal of Surgery. 2012; 1(18)27-29.

[36] 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: 4927–9.

[37] Terkimbi UB, Joseph IT, Barnabas E. Retained Post-Operative Foreign Body of Gynaecologic Origin at Ascending Colon, Gynecol Obstet Case Rep. 2016, 2:2. doi:10.21767/2471-8165.1000028.

[38] Dane, C., Yayla, M; Dane, B. Gynecol Surg (2006) 3: 130. https://doi.org/10.1007/s10397-006-0181-5.

[39] Kokubo T, Itai Y, Ohtomo K, et al. Retained surgical sponges: CT and US appearance. Radiology 1987; 165: 415–418.

[40] Haegeman S, Maleux G, Heye S, et al. Textiloma complicated by abscess-formation, three years after surgical repair of abdominal aortic aneurysm. JBR-BTR 2008; 91: 51–53.

[41] Ali Aminiam. Gossypiboma: a case report. Case J. 2008: 1(1):220**.**

[42] S Lerner, D Magrane, E Friedman. Teaching teamwork in medical education. Mt Sinai J Med. 2009; 76: 318–29.