

Textiloma formation post endovascular repair of abdominal aortic aneurysm

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Abstract: We report a case of an 80-year-old man, who underwent an endovascular repair of an abdominal aortic aneurysm. Surgical access was obtained from both common femoral arteries, and the procedure was uneventful. One month computed tomography (CT) follow-up was without findings. Two months after endovascular aortic aneurysm repair (EVAR), the patient complained of claudication on the left side associated with persistent pain, rigid swelling on the left groin area, and occasional febrile episodes within the last month. Ultrasonography showed fluid collection, and needle aspiration gained pus. It was thought to be local postsurgical infection, and the patient got antibiotics, but he did worse. One month later, computed tomography revealed focal left common femoral artery (CFA) stenosis, edematous appearance of subcutaneous soft tissue in the left groin area, and anterior displacement of the ipsilateral CFA in relation to the right side. Surgical exploration of the region revealed retained, unencapsulated, and partially destroyed surgical gauze, lying just behind the left CFA, which was removed.

Keywords: textiloma, gossypiboma, endovascular repair, inflammation

Introduction

Textiloma or gossypiboma represents a mass-like lesion, formed around accidentally retained cotton or synthetic fibers in the body, usually during open surgical procedures [1]. They are most commonly intra-abdominally found; however, plenty of cases of textilomas are found to be located also in the thoracic area [2], in the thigh [3], the central nervous system [4], and the breast [5]. In the absence of high clinical suspicion, the diagnosis is challenging, as clinical symptoms may be nonspecific and imaging findings are often inconclusive. Delay in diagnosis could induce considerable morbidity [6]. Herein, we present a case of left inguinal textiloma as a late complication of an endovascular aortic aneurysm repair (EVAR) procedure.

Case Presentation

We report a case of an 80-year-old man, who had undergone an EVAR procedure for endovascular repair of an 8.3-cm large infra-renal abdominal aortic aneurysm. Since the endovascular procedure took place in another tertiary center, we were not aware of the technical details of the operation. As far as we know, the patient underwent EVAR through open arterial exploration and longitudinal incision of both common femoral arteries. On one-month follow-up computed tomography angiography (CTA), no pathologic findings were revealed. The patient came to us another month later, complaining of left lower limb claudication and pain and rigid swelling in the left groin area, while he referred transmitted episodes of fever.

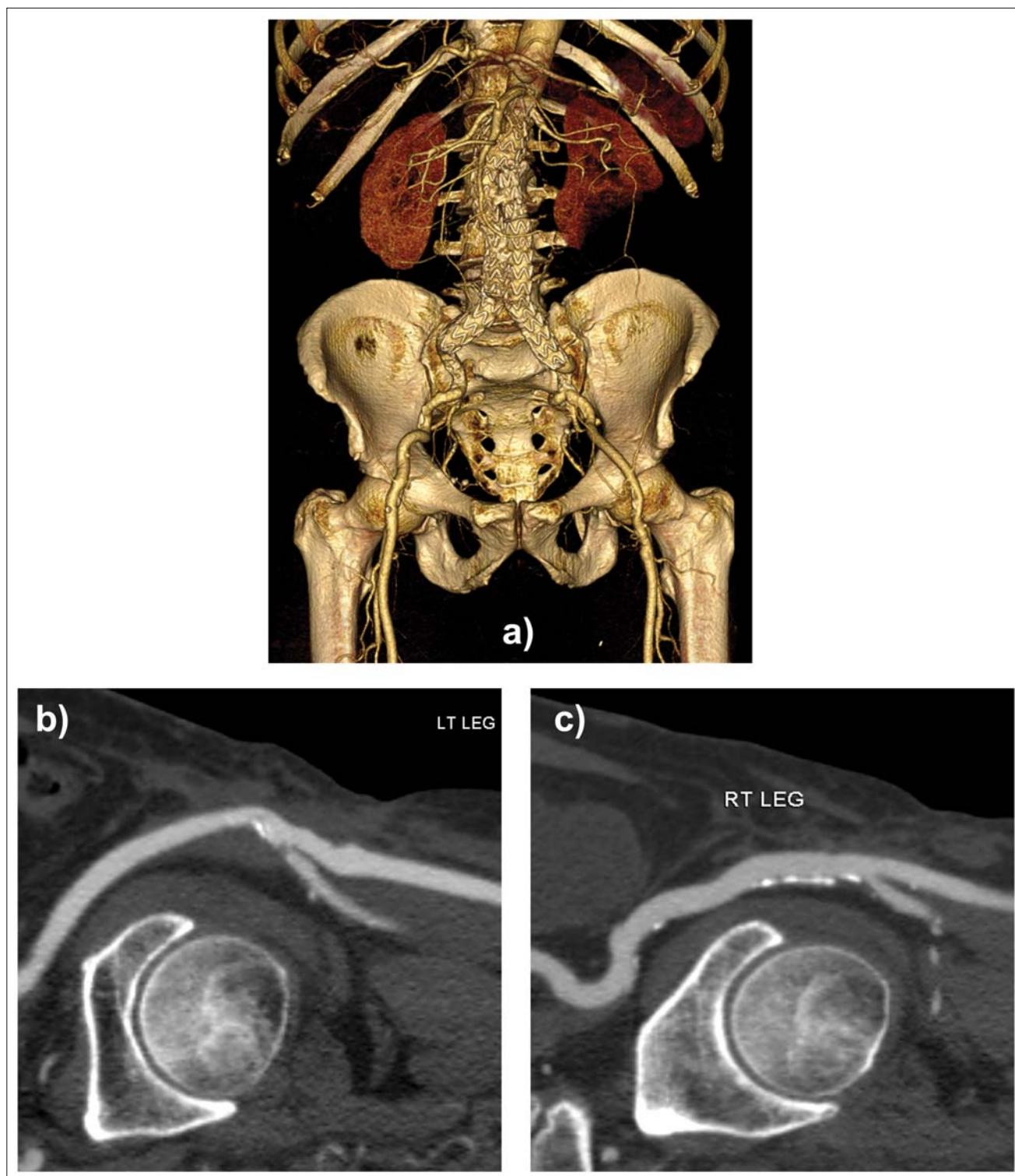


Fig. 1. (a) One-year CTA follow-up with good stent-graft patency and without further pathology. Moderate focal stenosis of the left CFA is seen. (b) Left common femoral artery bifurcation image after lumen middle line reconstruction shows anterior displacement of the CFA, focal left CFA stenosis, and slightly edematous appearance of the subcutaneous soft tissue in the left groin area. Retrospectively, the same image finding was seen also on the one-month follow-up CTA. (c) In relation to the left side, no pathological signs are seen around the right CFA

On physical examination, the left groin region was reddish, warm, and edematous while a mass-like lesion was present at deep palpation. Apart from slightly elevat-

ed white blood cell count ($12.0 \times 10^9/L$), the rest of the hematological and biochemical tests were within normal limits. Ultrasound examination revealed a fluid collec-

tion around the left common femoral artery (CFA), while color Doppler showed focal 50% stenosis of the vessel, with biphasic waveform in the superficial femoral artery (SFA). In order to rule out an inflammatory process, ultrasound-guided puncture of the palpated mass in the left groin area was conducted which drained a small pusscollection. Microbiological culture of the fluid's sample was negative. Oral double broad spectrum antibiotic therapy was suggested; however, symptoms were only partially relieved.

As mentioned above, the standard one-month post-EVAR follow-up with computed tomography angiography (CTA), postinterventional course was estimated as

uncomplicated. Thus, new CTA was ordered 1 month after ultrasound guided aspiration, to exclude vascular and soft tissue pathology. On this, 3 months post-EVAR CTA, focal left CFA stenosis and slightly edematous appearance of the subcutaneous soft tissue in the left groin area were seen. Additionally, anterior displacement of the ipsilateral CFA in relation to the right CFA was noted (*Fig. 1a-c*). Nevertheless, there were no imaging features of an underlying inflammatory process or abscess formation. Retrospectively, the anterior displacement of the ipsilateral CFA was seen also on the previous follow-up CTA.

Due to deterioration of his symptomatology, the patient underwent immediate surgical exploration of the

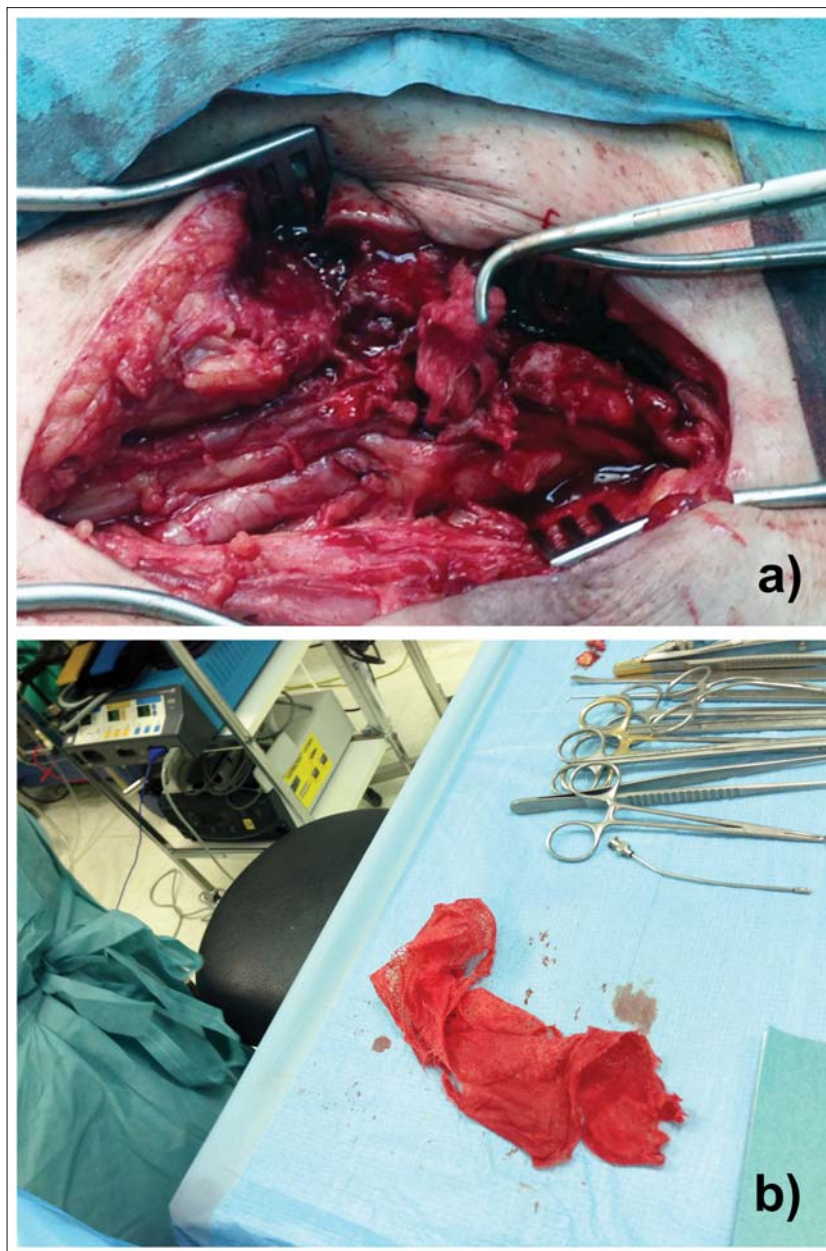


Fig. 2. (a) Intraoperative photo with partial removal of the retained gauze. (b) Post-operative photo of the removed gauze

region, which revealed disseminated inflammation of the soft tissues surrounding the CFA. A retained, unencapsulated, and partially destroyed surgical gauze, lying just behind the left CFA, was found occupying a space of about 2×2 cm. The gauze was finally removed with great difficulty (*Fig. 2a* and *b*). It was probably put there to control a minor hemorrhage. Surgical restoration of the inflamed CFA wall was performed after correction of the focal stenosis by arterectomy and replacement with a 3-cm long venous segment from the great saphenous vein. Finally, the inflamed surrounding tissue was thoroughly cleaned. We did not send the gauze to bacteriology because we thought that it would be negative since the patient was already under double antibiotics treatment and the earlier fluid aspiration was also negative. Nevertheless, we consider that it should be sent anyway. Postoperative recovery was unremarkable, and complete resolution of symptoms was achieved in the following days.

Discussion

Accidentally retained cotton or synthetic fibers, during interventional procedures, produce a type of foreign body reaction with consequent mass-like lesion formation, referred as textiloma or gossypiboma. It represents an unusual besides serious surgical complication with a reported incidence which varies between 1:5,000 and 1:19,000 [7, 8]. As a textiloma diagnosis is strongly related to medico-legal implications, the aforementioned incidence is believed to be underestimated.

Many factors have been associated with the presence of textilomas, with emergency surgeries, unplanned changes in surgical procedures, and elevated body-mass index, representing the majority of them [9]. Such risk factors apply more frequently to intra-abdominal surgeries, and that explains the high incidence of these mass-lesions in the abdominal cavity. Less commonly than intra-abdominally, such lesions reside in the pelvis [8] and thorax [2], while there are few reported cases of a more rare presentation in the central nervous system, breast, and lower extremity [3–5]. To the best of our knowledge, there is no described case of an inguinal textiloma after a bifemoral accessed endovascular procedure.

Textilomas may induce two types of reaction: aseptic fibrinous or exudative. The former type refers to a biochemically inert, foreign body response which creates fibroblastic reaction, encapsulation, and consequent granuloma formation. In this type of reaction, the clinical course is usually occult and patients remain asymptomatic. The second type, typically presenting in the early postoperative period, is characterized by an inflammatory process with potential secondary bacterial contamination and abscess or fistula formation [1].

Plain radiographs represent the most commonly used method for retained cotton or synthetic fibers detection. Most surgical gauzes contain an incorporated radiopaque marker which facilitates their detection on plain radiographs; besides surgical equipment lacking, this kind of radiographically distinctive material is still used in many centers [10]. In the absence of a distinctive radiopaque thread, the unusual depiction of the characteristic whirl-like pattern, consisting of lamellar, curvilinear radiopaque stripes with mottled radiolucency, presumably due to air bubbles, may aid to the correct diagnosis [11]. Also in our case, no radiopaque marker or whirl-like pattern was visualized.

Computed tomography (CT) is the mainstay of preoperative diagnosis of textilomas, followed by plain radiography and ultrasound [12]. Textilomas may depict a wide spectrum of CT features, depending on their chronicity and the type of induced reaction. In the early postoperative period, imaging findings are well defined and include a marginated hypodense mass with a hyperdense rim, which is highlighted after intravenous contrast material administration, while the center of the lesion remains hyperdense. A whirl-like pattern consisting of multiple curvilinear hyperdense bands together with air bubbles is the most specific CT sign [13, 14]. Calcification of the mass or a reticulate ring sign may also be visualized [1]. On later stages, the appearance mostly resembles that of a solid mass due to the resorption of the trapped amount of air [15].

In the presenting case, the lack of a radiopaque marker together with the absence of typical CT findings precluded an early diagnosis. Clinical symptomatology led to ultrasound examination of the groin with needle aspiration of the fluid seen around the CFA. The only CT-imaging finding implying the presence of a possible underlying space-occupying lesion was the anterior displacement of common femoral artery. Taking into account the low index of clinical suspicion, as the surgical procedure was uncomplicated, routinely performed, and there was minimal invasion in the groin area, a potential explanation in the delayed diagnosis could be provided.

The textiloma remained silent for about 2 months before causing any symptoms. The gauze was one usually used in interventional radiology (IR) suites, so it did not contain metallic threads to be easily identified by X-ray. We think that such gauzes should be avoided during EVAR procedures. From surgical point of view, the long-term inflammation led to arterial wall infection and subsequent focal stenosis which caused the patient's main symptom of claudication. Open surgical repair was mandatory in order to clean the infected area, repair the arterial damage, and remove the foreign body.

An accidentally retained foreign body, despite its low incidence, should be considered in the differential diagnosis in all patients with unexplained persistent symptoms and a history of prior surgery. Comprehensive de-

tailed interpretation of imaging findings is mandatory, and even a minimal indication of the presence of space-occupying lesion should be considered with suspicion.

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