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CASE REPORT

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Not all that glitters is tumour: radiological finding of a plugoma and review of the literature

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ABSTRACT

Background: The imaging of "plugoma" (or meshoma) has not been largely described in the literature and could conduct to misdiagnosis. Therefore, there is a need for surgeons and radiologists to further their knowledge about postsurgical anatomic alterations after hernia repair.
Case Presentation: In this paper, we describe our finding of a right inguinal mass at CT scan and 18F fluorodeoxyglucose positron emission tomography/Computed tomography (CT) in differential diagnosis with metastasis, which ultimately resulted in a plugoma.
Conclusion: Our imagining effort together with our considerations may help other colleague to identify this alteration, thus avoiding unnecessary treatment for patients.

ARTICLE HISTORY

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KEYWORDS

Hernia; plugoma;meshoma foreign body reaction; PET captation; unnecessary workup

Background

Nowadays prosthetic mesh repair represents the method of choice in inguinal hernia surgery. The use of prothesis has significantly lowered the recurrence rate. Imaging findings related to the reparation technique could conduct to a misdiagnosis and unnecessary workup or surgery, although surgeons and radiologists must be confident to recognize postoperative change.

Case Report

We present a case of 75-year-old female with previous mastectomy for invasive ductal carcinoma about 5 years ago and an inguinal hernia repair about 40 years ago.

During work up for suspicion of timoma, 18F fluorodeoxyglucose (FDG) positron emission tomography (PET)/Computed tomography (CT) detected an incidental hypermetabolic soft tissue mass in right inguinal region between bowel and abdominal wall (Fig. 1).

CT scan showed a 2-cm oval mass incorporating inferior epigastric vessels, Hounsfield unit (HU) measurement was around 150 (Figs. 2–4).

At the clinical examination, the patient was asymptomatic from inguinal region; yet, the clinician observed an epigastric hernia with a 2-cm wall defect, and the patient reported a painful sensation at the site of the bulge.

Although the previous follow-up for breast cancer was negative, the patient had never received a PET scan before the work-up for timoma. Indeed, the timoma was a new finding in a recent thorax CT scan and there was no report in previous imaging.

In consideration of previous oncological history, lack of similar reports in the literature and the need to repair the epigastric hernia, we decided to perform an IPOM plus (intraperitoneal onlay mesh repair) and exploring the pelvis to check the mass in order to exclude a metastasis or a lymphadenopathy.

The intraoperative finding was a hard mass visible through the peritoneum (Fig. 5) and we proceed with the removal with clips apposition on the epigastric vessels.

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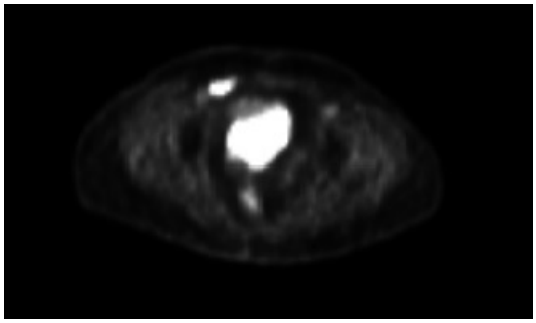


Figure 1. PET scan with captation in right inguinal region.



Figure 2. CT scan findings of plugoma.

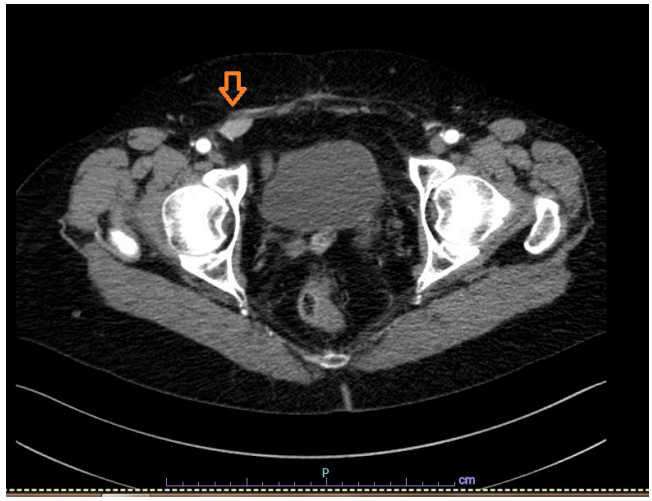


Figure 3. CT scan findings of plugoma.

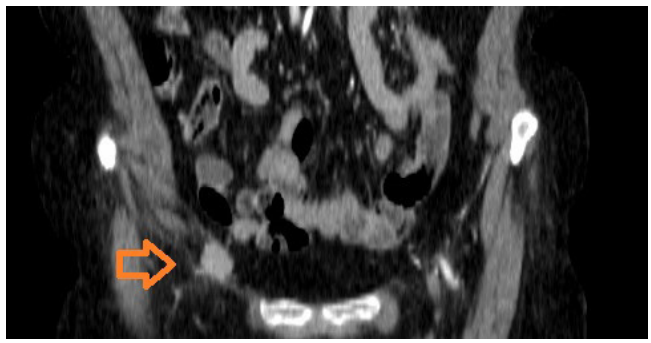


Figure 4. CT scan findings of plugoma.

We decide to proceed with transabdominal preperitoneal inguinal hernia repair to reinforce the inguinal wall through a preperitoneal mesh, thus avoiding a recurrent hernia.

The specimen was a plugoma, a granulomatous reaction to a plug implanted 40 years before, characterized by macrophages, granulomas, and foreign body giant cells.

The patient was discharged in 4th post-operative day without complications.

Discussion

Long-term postsurgical changes after hernia repair are not well-described radiographically in the literature.

In the study by Aganovic et al. [1], radiologists were able to identify the 100% of the plugs in a CT scan review in patients who underwent prosthetic plug hernia repair. They described the plugs as round or oval in shape in close proximity to the inferior epigastric artery, HU measurement averaged from 7 to 36 (range 0–51) according to contrast phase. In another study, mean attenuation value was 17 HUs (range, 4–64 HU) [2].

Host reaction at the prosthetic materials could conduct to vary degree of inflammation with the deposition of connective tissue and the formation of a granuloma [3], called meshoma [4]. Persistent foreign body reaction is independent of the implantation time, but considerably affected by the type of mesh material [3].

Several articles discussed about the wrong indication to remove an incidental plugoma [5,6]. After collegial discussion, we decided to proceed with the removal for several reasons: in the literature there was not analog case with PET captation after this long time, our HU measurement was higher than described cases and our patient had the longest interval time from the inguinal repair. Moreover, the plug was about to pierce the peritoneal cavity, thus causing long-term injuries at the bowel.

In consideration of previous breast cancer, the suspicion of timoma together with, the absence of previous reports of these findings at the imaging as well as the long term risk to leave the plug inside

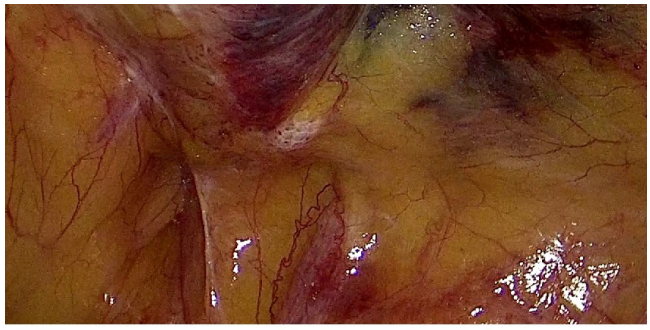


Figure 5. Intraoperative finding.

the peritoneal cavity, we preferred to remove the specimen to exclude metastases and to avoid long-term complications.

Although several reports describe the appearance of mesh or plug at CT scan after surgery, PET captation is quite uncommon, and however, using medline search, we did not find previous report with high metabolic glucose captation and simultaneous CT study.

Hypermetabolism on PET scans is directly proportional to the inflammation and may mimic metastases. The metabolic activity is directly proportional to the severity of the inflammation and this process can be seen for years [7].

In our patient, it could be explained by a strong inflammation around the plug that was crossing the peritoneum and could interest the bowel.

The persistence of inflammation at the mesh-tissue interface could explain several postsurgical complications like chronic pain. Although the patient had no symptoms, our lesion had a very similar appearance on CT scan as in the case of a migrated Bard PerFix plug that was found intraperitoneally and was presumed to be a cause of pelvic pain in a patient after indirect hernia repair [8].

Surely other markers should be investigated to have a definitive correlation between the Pet captation and postsurgical complications.

The knowledge of radiologic findings could help to identify patients who could benefit for surgical explanation. In addition to metastases, the most common misdiagnoses are represented by lymphadenectomy, recurrent hernia, and free fluid in inguinal canal.

In our case, more detailed studies before surgery, such as ultrasound and magnetic resonance imaging could help to detect used meshes for the purpose of repairing inguinal hernia. Moreover a late-phase FDG-PET scanning is recommended (at least 1 hour later) for the purpose of ruling out malignant tumors.

We suggest that an atypical lesion in inguinal region, with PET captation and CT scan report of round or oval shape, should be correlated with previous hernia repair.

Conclusion

We believe that our case and imaging may help other surgeons and radiologists to define this kind of lesion, although imaging may mimic metastasis, the knowledge of this finding should lead to right choice for the patient in order to avoid unnecessary workup. Moreover, this report could help identify patients with long-term inflammation related to plug implantation; this persistent reaction could explain long term complications like chronic pain or initial peritoneum fistulization. The wide range of attenuations on CT scan and Pet captation may be reflective of varying degrees of fibrotic reaction and inflammation or old blood associated with the mesh, but certainly more radiological reports will be necessary to correlate radiological findings to complications.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

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Consent for publication

A written informed consent to publish this case was obtained from the patient.

Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

References

1. Aganovic L, Ishioka KM, Hughes Cassidy F, Chu PK, Cosman BC. Plugoma: CT findings after prosthetic plug inguinal hernia repairs. J Am Coll Surg 2010; 211(4):481–4; doi: 10.1016/j.jamcollsurg.2010.06.001
2. Chernyak V, Rozenblit AM, Patlas M, Kaul B, Milikow D, Ricci Z. Pelvic pseudolesions after inguinal hernioplasty using prosthetic mesh: CT findings. J Comput Assist Tomogr 2007;31(5):724–7; doi: 10.1097/rct.0b013e3180315db8.
3. Klinge U, Klosterhalfen B, Müller M, Schumpelick V. Foreign body reaction to meshes used for the repair of abdominal wall

hernias. Eur J Surg 1999;165(7):665–73; doi:10.1080/11024159950189726.
4. Amid PK. Lichtenstein tension-free hernioplasty: its inception, evolution, and principles. Hernia 2004;8(1):1–7; doi: 10.1007/s10029-003-0160-y.
5. Staiano JJ, Savage P, Stephenson BM, Milling MA. Mesh mimics metastasis. Lancet 2005;366(9482):341; doi: 10.1016/S0140-6736(05)66993-0.
6. Amid PK. Radiologic images of meshoma: a new phenomenon causing chronic pain after prosthetic repair of abdominal wall hernias. Arch Surg 2004;139(12):1297–8; doi:10.1001/archsurg.139.12.1297.
7. Gupta K, Jadhav R, Virmani S. 18F-FDG PET/CT appearance of plugoma. J Nucl Med Technol 2020;48(2):177–8; doi: 10.2967/jnmt.119.233999.
8. Moorman ML, Price PD. Migrating mesh plug: complication of a well-established hernia repair technique. Am Surg 2004;70:298Y299.