



Contents lists available at ScienceDirect

## International Journal of Surgery Case Reports

journal homepage: [www.casereports.com](http://www.casereports.com)A retained plastic protective cover mimicking malignancy: Case report<sup>☆</sup>Mustafa Ozsoy<sup>a,\*</sup>, Bahadır Celep<sup>a</sup>, İsmail Ozsan<sup>b</sup>, Ahmet Bal<sup>a</sup>, Ziya Taner Ozkececi<sup>a</sup>, Yüksel Arikan<sup>a</sup><sup>a</sup> Department of General Surgery, Afyon Kocatepe University, Afyon, Turkey<sup>b</sup> Department of General Surgery, Izmir University, İzmir, Turkey

## ARTICLE INFO

## Article history:

Received 11 October 2012

Received in revised form 19 June 2013

Accepted 20 June 2013

Available online 8 September 2013

## Keywords:

Foreign body

Malignancy

Retroperitoneal

Surgery

## ABSTRACT

**INTRODUCTION:** Cases of retained foreign bodies during surgery are more frequently seen in developing countries. Following surgical procedures, unintentionally retained foreign bodies can cause serious complications, in addition to medico-legal issues.

**PRESENTATION OF CASE:** A 60-year-old man presented with abdominal cramps. He had previously undergone a laparoscopic radical right nephrectomy due to renal cell carcinoma. Abdominal tomography revealed a mass surrounding the main vascular structures with malignant features in the location of previously performed nephrectomy. Further evaluation of the mass was undertaken by PET/CT. Increased FDG uptake on the PET/CT scan suggested disease recurrence. Retroperitoneal lymph node dissection was performed. The dissection specimen was opened to determine the nature of the mass. Retained plastic foreign bodies were found. There were no malignant cells in the histopathological examination of the surgical specimen.

**DISCUSSION:** A granulomatous reaction which is mainly responsible for morbidity occurs around the foreign bodies due to the inflammatory response. These granulomas may cause confusion during patient follow-up, especially in those who have undergone major abdominal surgery due to cancer.

**CONCLUSION:** Following surgical resection for malignancy, unintentionally retained foreign bodies can produce a moderate increase in FDG uptake mimicking disease recurrence.

© 2013 The Authors. Published by Elsevier Ltd on behalf of Surgical Associates Ltd. All rights reserved.

## 1. Introduction

Retained foreign bodies complicate up to 1 per 1000 surgical procedures.<sup>1</sup> Cases with retained foreign bodies following surgery are more frequently observed in developing countries. The most frequently encountered foreign bodies are surgical sponges, surgical instruments and suture materials.<sup>2</sup> Many problems may be seen due to foreign bodies, most of which are caused by the inflammatory response of the host. Depending on the severity of the inflammation, penetration of the foreign material into the surrounding tissues, migration and even fistulization may be observed. Foreign bodies are more frequently forgotten following major abdominal surgery for cancer.<sup>3</sup> We present a patient believed to have recurrent renal cell carcinoma which turned out to be an unintentionally retained foreign body.

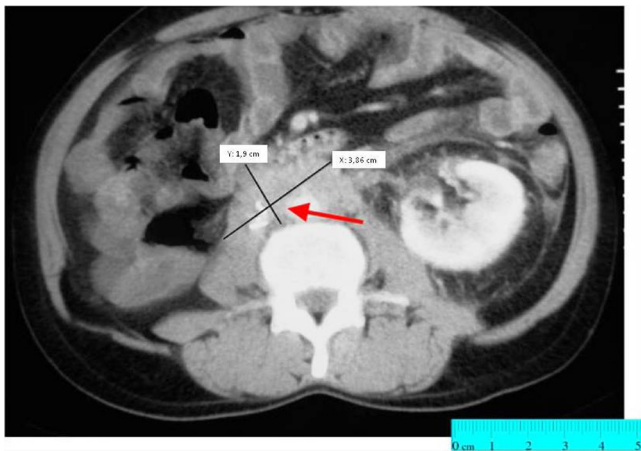
<sup>☆</sup> This is an open-access article distributed under the terms of the Creative Commons Attribution-NonCommercial-No Derivative Works License, which permits non-commercial use, distribution, and reproduction in any medium, provided the original author and source are credited.

\* Corresponding author at: 1819/11 Sok. No: 16/10 İstasyonalıtı Mahallesi, Çiğli, İzmir 35630, Turkey. Tel.: +90 0236 376 12 24; fax: +90 0236 232 17 48.

E-mail address: [dr.mustafafozsoy@gmail.com](mailto:dr.mustafafozsoy@gmail.com) (M. Ozsoy).

## 2. Case report

A 60-year-old man presented with abdominal cramps and right sided back pain. He had undergone a laparoscopic right radical nephrectomy for renal cell carcinoma 5 years earlier. His family history was nonspecific. Physical examination and routine blood tests were normal. Abdominal ultrasonography was nonspecific, while abdominal tomography revealed a mass surrounding the main vascular structures with malignant features in the location of previously nephrectomy (Fig. 1). Magnetic resonance imaging results were similar to abdominal tomography. We decided to use positron emission tomography (PET/CT) to determine whether the mass was malignant or benign (Fig. 2). The mass was deemed to be malignant due to increased metabolic activity with a SUV max of 10.3 (normal value <5), and surgical intervention was deemed appropriate for an apparent local recurrence of renal cell carcinoma (Fig. 3). During the operation, dense adhesions were encountered between the ascending colon and the retroperitoneum. The right colon and duodenum were dissected from the retroperitoneum. A firm mass was detected with irregular borders surrounding the inferior vena cava and aorta. Dissection began from the distal to the proximal part of the mass. Retroperitoneal lymph node dissection including the periaortic and pericaval lymph nodes was performed. The region of previous operation was also included in the dissection (Fig. 4).

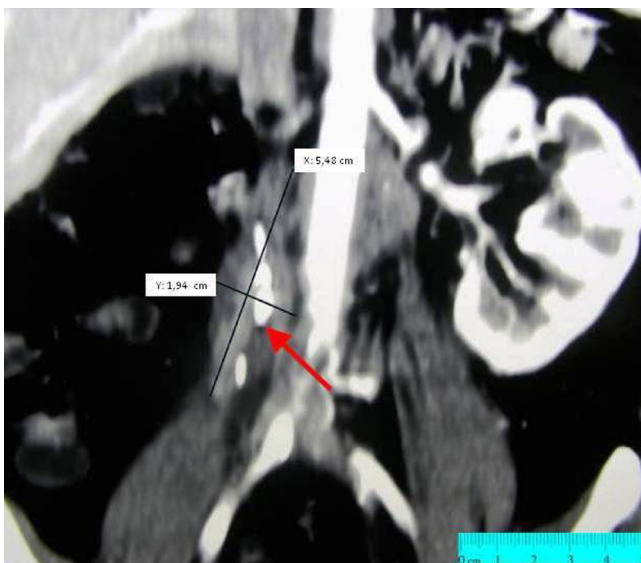


**Fig. 1.** A mass image surrounding the main vascular structures containing calcifications is observed in computerized axial tomography.

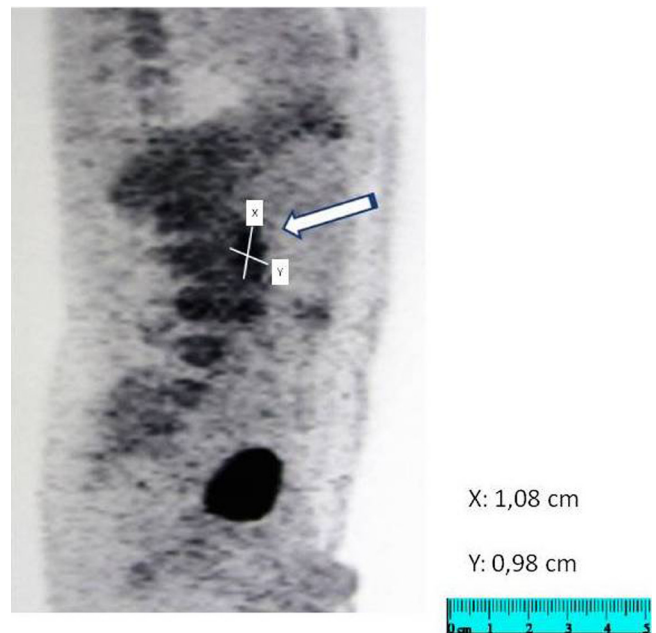
The resected specimen was opened and unintentionally retained plastic foreign bodies were found (Fig. 5A). Detailed analysis of the patient's previous operative note and the hospital bill showed that an endovascular stapler [45 mm articulating vascular stapler (Ethicon Endosurgery, CA)] had been used for vascular control (Fig. 5B). We matched the specimen and the endovascular stapler and recognized that the foreign bodies exactly resembled the plastic protective cover of the vascular stapler. There were no malignant cells in the histopathological examination of the surgical specimen.

**3. Discussion**

Radical nephrectomy is the most effective treatment for localized renal cancers.<sup>4</sup> The most important prognostic criteria in renal cancers are lymph node involvement and the presence of metastatic foci that are also known to have the ability to metastasize by lymphatic and hematogenous spread. Parker is the first author who outlined the renal lymphatic drainage pathways. However, Robson described the details of the technique of retroperitoneal lymph node dissection.<sup>5</sup> Currently, this technique is modified to limited dissection of the para-precaval and hilar lymph nodes in right-sided tumors, and of para-preaortic and

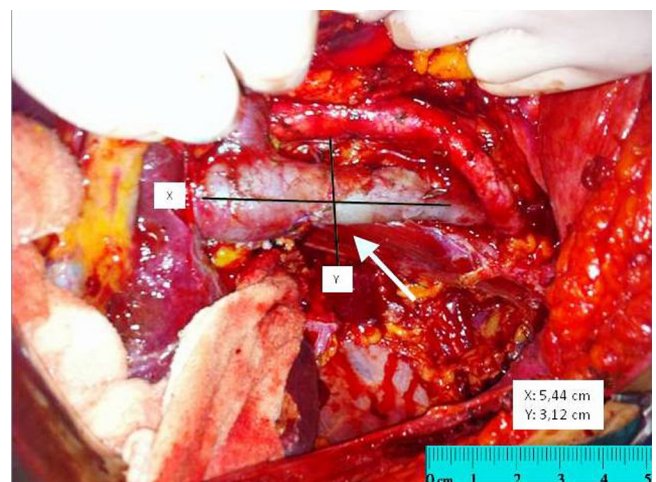


**Fig. 2.** A mass shows hyper intense signal intensity related to adjacent muscle and aorta in coronal image of contrast abdominal computed tomography.

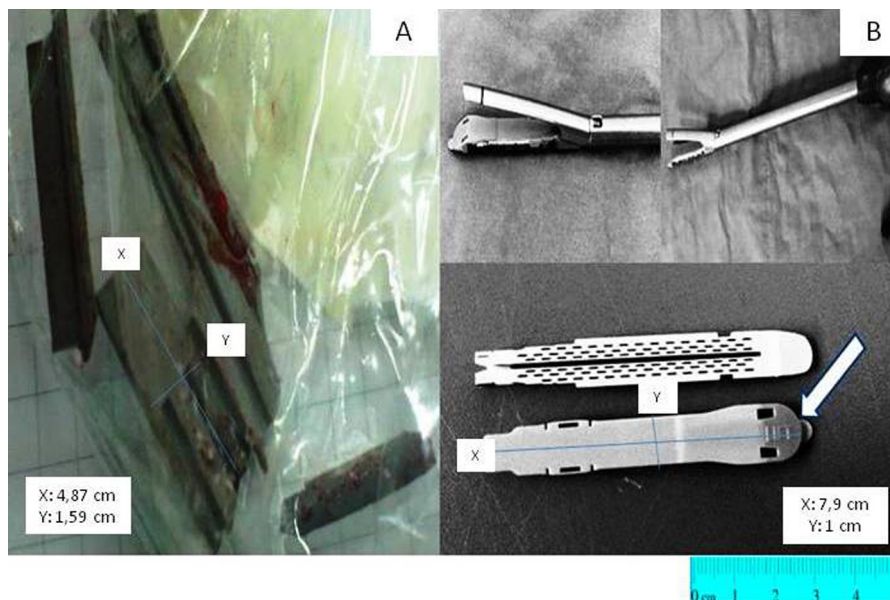


**Fig. 3.** A mass reveals intense homogeneous uptake (arrow) in axial PET/CT fusion.

hilar lymph nodes in left-sided tumors.<sup>6,7</sup> Radical nephrectomy and lymph node dissection can be performed by minimally invasive techniques. However, many surgeons still choose the conventional technique to provide a complete resection with safe surgery. Following major surgical procedures, such as radical nephrectomy, unintentionally retained foreign objects can result in serious complications, in addition to medico-legal issues. In spite of the number of preventive measures currently taken, retained foreign objects are still encountered in 0.3 to 1 per 1000 cases.<sup>8</sup> The main factors responsible for retained foreign objects during operations are long operating hours, inefficient and inexperienced surgical personnel, inattentiveness of the surgeon, emergent cases, extremely obese patients, and the application of new surgical techniques.<sup>9</sup> Systemic procedures, team briefings and double checking sponge and instrument counts have been introduced at least once to prevent such cases. The most frequently retained foreign objects are surgical sponges, surgical instruments, and suture materials. The clinical picture is usually non-specific and varies according to the localization and the nature of the foreign object.



**Fig. 4.** Operation field after resection and periaortic-pericaaval lymph node dissection.



**Fig. 5.** (A) Unintentionally retained foreign objects removed from the surgical specimen is seen. (B) Laparoscopic endovascular stapler fired without removing the cover (white arrow) is observed as an example.

This patient was included in the one of the first laparoscopic radical nephrectomy cases in our clinic. Laparoscopic surgery has obvious advantages over open surgery, such as decreased analgesic consumption, faster recovery, reduced time to return to work and improved cosmetic outcomes. With increased laparoscopic experience, the surgical technique and its outcomes significantly improve.<sup>10</sup> Generally the main reason for the transition from laparoscopic to conventional nephrectomy is the failure to control bleeding. Many attempts have been made to improve vascular control in laparoscopic surgery, and endovascular staplers are often used today. Dang et al. have evaluated gastrointestinal complications associated with surgical staplers in detail.<sup>11,12</sup> The worst handicap of endovascular stapler is the failure to completely remove the stapler after firing. In this case, the patient presented with severe lower back and abdominal pain secondary to the inflammatory response caused by a retroperitoneal foreign object. Severe morbidities such as infection, bleeding, perforation and migration of the object can be observed secondary to the retained foreign objects.<sup>13</sup>

Chronic inflammatory response of the host against the foreign material and granulomas secondary to this response are the primary reason for the complications.<sup>14</sup> Granulomas result in confusion during follow-up, particularly in those who have undergone major abdominal surgery due to cancer. Experimental and clinical studies show that granulomas developing secondary to any foreign material anywhere in the body can mimic tumor recurrence or metastasis in the follow-up imaging studies obtained after surgery. Although abdominal tomography and magnetic resonance imaging results vary according to the origin of the foreign bodies, most frequently a fibrotic capsule with air echogenities, an irregular shaped mass or bodies in the shape of an opaque foreign material can be observed.<sup>15</sup> A frequently used new imaging technique in the diagnosis and follow-up of cancer is positron emission tomography, which relies on the uptake and utilization of 18-fluorodeoxyglucose (18-FDG) by cancer cells. PET might demonstrate an activity enhancement-mimicking malignancy due to the inflammatory reaction against the foreign bodies. The activation rate in PET increases according to the size of the investigated

mass.<sup>16</sup> Differentiating benign from malignant processes on PET is challenging. It is well known that many benign disorders such as inflammation, granulomatous diseases, and abscesses might demonstrate increased activity uptake in PET. Many authors advocate dual-time-point imaging with FDG-PET or FDG-PET/CT.<sup>17</sup> Metser et al. reported weak or moderate activity in most benign lesions. A high activity uptake is much more likely to indicate malignancy.<sup>18</sup> We interpreted the present findings as recurrence of the disease since the patient had a previous radical nephrectomy for malignancy. The increased FDG uptake of the mass in the imaging study led us to insist on an incorrect diagnosis without reviewing other possible diagnoses. The significant period of time elapsed after his nephrectomy, and the absence of metastatic foci during the follow-up should were more consistent with a probable benign process.

#### 4. Conclusion

Following surgical resection for malignancy, unintentionally retained foreign bodies can produce a moderate increase in FDG uptake mimicking disease recurrence.

#### Conflict of interest

We certify that no actual or potential conflict of interest in relation to this article exists.

#### Funding

None.

#### Ethical approval

Obtained.

#### Author contributions

All authors contributed.

## References

1. Bulus H, Simsek G, Coskun A, Koyuncu A. Intraabdominal gossypiboma mimicking gastrointestinal stromal tumor: a case report. *Turk J Gastroenterol* 2011;**22**(5):534–6.
2. Gwande AA, Studdert DM, Orav EJ, Brennan TA, Zinner MJ. Risk factors for retained instruments and sponges after surgery. *N Engl J Med* 2003;**348**(January (3)):229–35.
3. Rappaport W, Haynes K. The retained surgical sponge following intra-abdominal surgery. A continuing problem. *Arch Surg* 1990;**125**(March (3)):405–7.
4. Godley PA, Stinchcombe TE. Renal cell carcinoma. *Curr Opin Oncol* 1999;**11**(May (3)):213–7.
5. Robson CJ, Churchill BM, Anderson W. The results of radical nephrectomy for renal cell carcinoma. 1969. *J Urol* 2002;**167**(February (2 Pt 2)):873–5.
6. Blute ML, Leibovich BC, Chevillet JC, Lohse CM, Zincke H. A protocol for performing extended lymph node dissection using primary tumor pathological features for patients treated with radical nephrectomy for clear cell renal cell carcinoma. *J Urol* 2004;**172**(August (2)):465–9.
7. Terrone C, Guercio S, De Luca S, Poggio M, Castelli E, Scoffone C, et al. The number of lymph nodes examined and staging accuracy in renal cell carcinoma. *BJU Int* 2003;**91**(January (1)):37–40.
8. Stawicki SP, Evans DC, Cipolla J, Seamon MJ, Lukaszczyk JJ, Prosciak MP, et al. Retained surgical foreign bodies: a comprehensive review of risks and preventive strategies. *Scand J Surg* 2009;**98**(1):8–17.
9. Greenberg C, Gawande A. Retained foreign bodies. *Adv Surg* 2008;**42**:183–91.
10. Vickers AJ, Bianco FJ, Serio AM, Eastham JA, Schrag D, Klein EA, et al. The surgical learning curve for prostate cancer control after radical prostatectomy. *J Natl Cancer Inst* 2007;**99**:1171.
11. Bernie JE, Sundaram CP, Guise AI. Laparoscopic vascular control techniques in donor nephrectomy: effects on vessel length. *JSL* 2006;**10**(April–June (2)):141–4.
12. Deng DY, Meng MV, Nguyen HT. Laparoscopic linear cutting stapler failure. *Urology* 2002;**60**:49–53.
13. Gonzalez-Ojeda A, Rodriguez-Alcantar DA, Arenas-Marquez H, Sanchez Perez-Verdia E, Chavez-Perez R, Alvarez-Quintero R, et al. Retained foreign bodies following intra-abdominal surgery. *Hepatogastroenterology* 1999;**46**(March–April (26)):808–12.
14. Poyanli A, Bilge O, Kapran Y, Guven K. Case report: foreign body granuloma mimicking liver metastasis. *Br J Radiol* 2005;**78**(August (932)):752–4.
15. O'Connor AR, Coakley FV, Meng MV, Eberhardt SC. Imaging of retained surgical sponges in the abdomen and pelvis. *AJR Am J Roentgenol* 2003;**180**(February (2)):481–9.
16. Ghersin E, Keidar Z, Brook OR, Amendola MA, Engel A. A new pitfall on abdominal PET/CT: a retained surgical sponge. *J Comput Assist Tomogr* 2004;**28**(November–December (6)):839–41.
17. Zhuang H, Pourdehnad M, Lambright ES. Dual time point 18, F-FDG PET imaging for differentiating malignant from inflammatory processes. *J Nucl Med* 2001;**42**:1412–7.
18. Metser U, Miller E, Lerman H, Even-Sapir E. Benign nonphysiologic lesions with increased 18, F-FDG uptake on PET/CT: characterization and incidence. *AJR Am J Roentgenol* 2007;**189**(November (5)):1203–10.

## Open Access

This article is published Open Access at [sciedirect.com](http://sciedirect.com). It is distributed under the [IJSCR Supplemental terms and conditions](#), which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.