



Contents lists available at ScienceDirect

Gynecology and Minimally Invasive Therapy

journal homepage: www.e-gmit.com

Case report

A false positive fluorodeoxyglucose positron emission tomography/computed tomography diagnosis of pelvic lymph node recurrence following surgical treatment of Stage 1 endometrial cancer—a case report



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ARTICLE INFO

Article history:

Received 9 April 2016

Received in revised form

4 February 2017

Accepted 8 February 2017

Available online 10 March 2017

Keywords:

corpus luteal cyst

endometrial cancer

lymph node recurrence

PET-CT scan

ABSTRACT

A 47 year old patient with a G3, FIGO stage 1A endometrial cancer was treated by hysterectomy. Her two ovaries were conserved because of the pre-operative diagnosis of endocervical cancer. On follow up PET-CT follow up investigation, she had a benign ovarian corpus luteal cyst mistaken as a metastatic pelvic lymph node which was later removed and proven benign histologically. This paper is to raise the clinical awareness of possible false positive PET finding from a benign ovarian cyst, such that a misinterpretation of "recurrence" as in this case can be avoided.

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Introduction

Medical imaging with ultrasound, computed tomography (CT), magnetic resonance imaging (MRI), and fluorodeoxyglucose (FDG) positron emission tomography (PET)/CT are commonly used to assess the extent and status of gynecological cancers, as well as to plan for their treatment.¹ It is generally agreed that PET-CT is an accurate modality for detecting lymphadenopathy and distant metastases. PET-CT plays an increasing role in the postoperative assessment of cancer recurrence in cancer patients. The detection of hypermetabolic lesion(s) in PET, combined with the high-resolution CT, can help to locate sites of early recurrence. This paper reports and discusses a patient with endometrial cancer to whom a benign ovarian corpus luteal cyst was mistaken as a metastatic pelvic lymph node on a PET-CT scan after surgery.

Case Report

A 47-year-old woman had an abdominal radical hysterectomy and bilateral pelvic lymphadenectomy performed with a

preoperative diagnosis of endocervical cancer. The pathology subsequently reported as endometrioid adenocarcinoma in an endometrial polyp, with Grade 3 differentiation, absence of lymphovascular invasion, involvement limited to the inner half of the myometrium, and no invasion to the cervical stroma. All excised pelvic lymph nodes were negative for malignancy. The endometrial polyp was found to protrude into the cervical canal mimicking an endocervical cancer. Clinically, she had The International Federation of Gynecology and Obstetrics (FIGO) Stage 1A, Grade 3 adenocarcinoma of the uterus. Her two ovaries were conserved because of the mistaken preoperative diagnosis of cervical cancer.

In the first 6 months after surgery, the patient was well except with mild lower abdominal discomfort. At her 6 months' follow-up, she requested to know the status of her ovaries as well as any residual cancer because her last surgery had both of her ovaries conserved. Her blood CA125, CA19.9, and SCC antigen levels were all normal. A PET-CT scan was performed. The radiologist's report revealed a right pelvic lesion with strong FDG uptake next to the right external iliac artery, and it was diagnosed as a recurrent metastatic right iliac lymph node (Figures 1A and 1B). There was no other active lesion in the rest of the body. Laparoscopy was performed because of the abnormal PET-CT finding and the need to remove both ovaries to complete her surgical staging. The operation revealed moderate adhesions in the pelvis and confirmed the

Conflicts of interest: The author has no conflicts of interest relevant to this article.
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<http://dx.doi.org/10.1016/j.gmit.2017.02.002>

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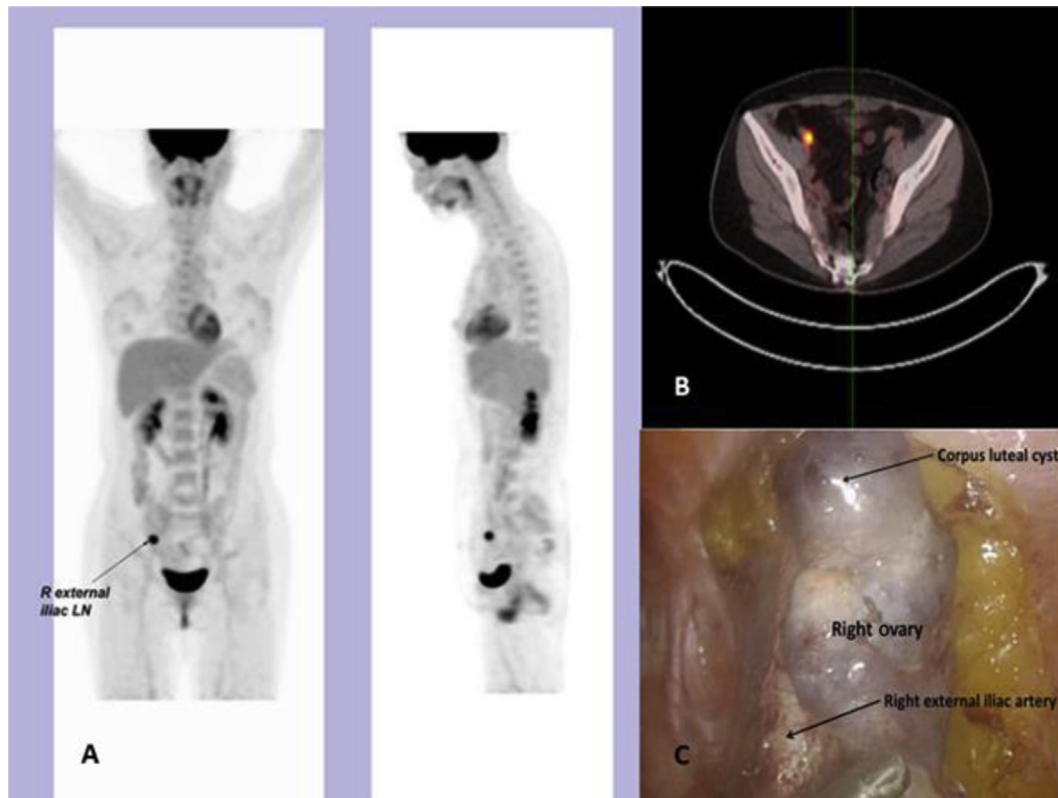


Figure 1. (A) A contrast enhanced computed tomography scan of the chest, abdomen and pelvis showed a round enhancing lesion in the right adnexal region corresponding to the positron emission tomography scan finding of a suspicious lymph node at the right external iliac artery. (B) Transverse pelvic positron emission tomography scan showed a fluorodeoxyglucose avid focus in the right adnexal region. (C) Laparoscopic finding of a corpus luteal cyst at the lower end of the right ovary lying over the right external iliac artery. R, right; LN, lymph node.

presence of a cystic tumor of 1.5 cm in the right ovary overlying the right external iliac artery (Figure 1C). Right salpingo-oophorectomy was performed and the tumor was removed intact in an endobag without rupture. The left ovary and tube were also removed at the same time. The entire right external and internal iliac vessels were surgically explored and revealed no enlarged lymph node.

The right ovarian tumor was histologically confirmed as a corpus luteal cyst without any evidence of malignancy. She was discharged home on Day 2 after her operation.

Discussion

FDG PET-CT scan has been used to differentiate benign lesions from malignant ones. Despite physiological FDG uptake had been reported by PET-CT in the myocardium, thyroid, skeletal muscle, hydrosalpinx, pedunculated fibroids, endometriosis, and benign ovarian conditions,^{2–5} abnormal uptake by ovarian corpus luteal cyst had been overlooked and misdiagnosed.^{6,7} Ames et al⁶ reported a patient with cervical cancer who was clinically upstaged to Stage 3 because of her preoperative PET-CT showed increased uptake in an ovary mimicking metastatic pelvic lymph node. It was subsequently confirmed to be a corpus luteal cyst. Bagga⁷ had also reported a case of an ovarian corpus luteal cyst being mistaken by PET-CT as malignant lymph node. Despite these reports, it had not increased the clinical awareness of the surgeon and radiologist in this case. Even though laparoscopic surgery, a minimally invasive approach, is able to make a definite diagnosis after removing the suspicious lesion, it is not without risk as complications of vascular, bowel, and ureteric injuries could potentially occur during the surgery. In this case, our radiologist had mistaken the

active FDG uptake lesion as a metastatic lymph node without prior clinical correlation and communication with the surgeon. The surgeon also was not aware of this clinical entity prior to the laparoscopy.

Therefore, lessons to be learnt from this case are: (1) when surgeons are to conserve ovaries in their cancer patients, they could consider applying large size metallic clips to mark and identify the ovaries. This would facilitate easy identification and localization of ovaries in subsequent ultrasound or PET-CT investigations. (2) If there is any uncertainty on the exact nature of the imaging findings, especially in the context of an awareness of a possible corpus luteal cyst, it is preferable to wait for 2–3 weeks to repeat another PET-CT scan or go for an ultrasound scan for further definition of the lesion, thus avoiding any unnecessary surgery. With a clinical awareness of possible positive PET findings from an ovarian corpus luteal cyst, misinterpretation of *recurrence* as in this case can be avoided. Concomitant ultrasound examination can also easily diagnose a corpus luteal cyst, or alternatively by using the new PET-MRI, which can precisely identify the increased uptake in an ovary. Today, the role of laparoscopic minimally invasive approach is well defined and serves to allow a cautious clinician to clarify any recurrence or remove it prior to the planning of any definitive treatment.

Conclusion

This case highlights the need to consider that physiological changes of ovaries could be associated with PET-CT scans in cancer patients. Increased ovarian uptake of FDG in various ovarian condition must be considered, and avoid being misinterpreted as a malignant lesion with potential adverse sequel. Hopefully, this case

report helps to increase the clinical awareness of a false positive PET-CT finding in a benign ovarian lesion, thus allowing appropriate management in our cancer patients.

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