

## CASE REPORT

# False-positive Positron Emission Tracing/Computed Tomography Secondary to Suture Granuloma Formation in Early-stage Endometrial Cancer

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## ABSTRACT

Suture granuloma formation can cause abnormal radiotracer uptake of 2-deoxy-2-[18F] fluoro-D glucose (FDG) in positron emission tracing/computed tomography (PET/CT) scan. It can be formed secondary to usage of silk suture during surgery as part of delayed host inflammatory reaction to a foreign body. Here, we report a case of a 61-year-old woman diagnosed with endometrial cancer who underwent tumor debulking surgery secondary to abnormal radiotracer uptake in PET/CT suspected as tumor recurrence which on histology revealed suture granuloma.

**Keywords:** Endometrial cancer, False-positive PET/CT, Silk suture, Suture granuloma.

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## INTRODUCTION

Endometrial cancer is a common gynecologic malignancy.<sup>1</sup> The primary management of endometrial cancer is peritoneal fluid cytology, total hysterectomy with or without bilateral adnexectomy with bilateral pelvic lymphadenectomy with or without paraaortic lymph node dissection.<sup>2</sup> The recurrence rate for early stage endometrial cancer is reported to be less than 15%.<sup>3</sup> Risk factors for recurrence include tumor grade, stage, and degree of LVSI.<sup>4</sup> Integrated PET/CT has combined benefits of anatomic tumor delineation of CT and functional changes or metabolic uptake detected by PET<sup>5,6</sup> making this modality ideal for detection of tumor metastasis and recurrence. False-positive PET/CT has been reported in different kinds of literature secondary to multiple benign conditions. The authors aim to report a case of a false-positive PET/CT scan suspected as tumor recurrence from endometrial malignancy but turned out to be suture granuloma secondary to silk sutures.

## CASE REPORT

A 61-year-old multiparous woman underwent laparoscopic extrafascial hysterectomy with bilateral salpingo-oophorectomy with bilateral pelvic and para-aortic lymphadenectomy for a biopsy-proven endometrial adenocarcinoma. During the surgery, silk sutures were used to ligate the infundibulopelvic and round ligaments and monofilament suture for vaginal cuff repair. Intraoperatively, the tumor invaded more than half of the myometrium (75%) and almost full thickness cervical stroma (95%). The surgery was uneventful and the patient had an unremarkable postoperative course. The final histopathologic diagnosis was moderately differentiated endometrioid adenocarcinoma involving the cervical stroma. All removed lymph nodes were negative for malignancy. The final diagnosis was stage II endometrial cancer. The patient had adjuvant radiotherapy, 50.4 gray in 28 fractions irradiating the whole true pelvis. Monitoring was done with periodic pelvic examinations revealing normal findings and no symptomatic complaints. However, nine months after the surgery, the patient complained of mild to moderate intermittent pelvic pain. CT scan was done which revealed a 1.5 × 1.2 cm contrast-enhanced nodule

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in the right pelvis suspicious for tumor recurrence. A whole-body tumor scan from skull vertex to upper thigh using 2-deoxy-2-[18F] FDG PET/CT was performed which showed abnormal radiotracer uptakes at several small peritoneal nodules/lymph nodes (score 3) with the largest one in right pelvic area (score 4), highly suspicious for malignancy, with a maximum standard uptake value (SUV max) of 15.3 (Fig. 1). Due to the high suspicion of tumor recurrence, she underwent surgery for tumor debulking. Intraoperatively, there were nodules at the left and right infundibulopelvic ligament stumps and the left and right round ligament stumps with visible silk sutures noted (Fig. 2). The rest of the abdominopelvic organs were smooth and free of tumor. The nodules were excised and histology revealed suture granuloma on all specimens (Fig. 3).

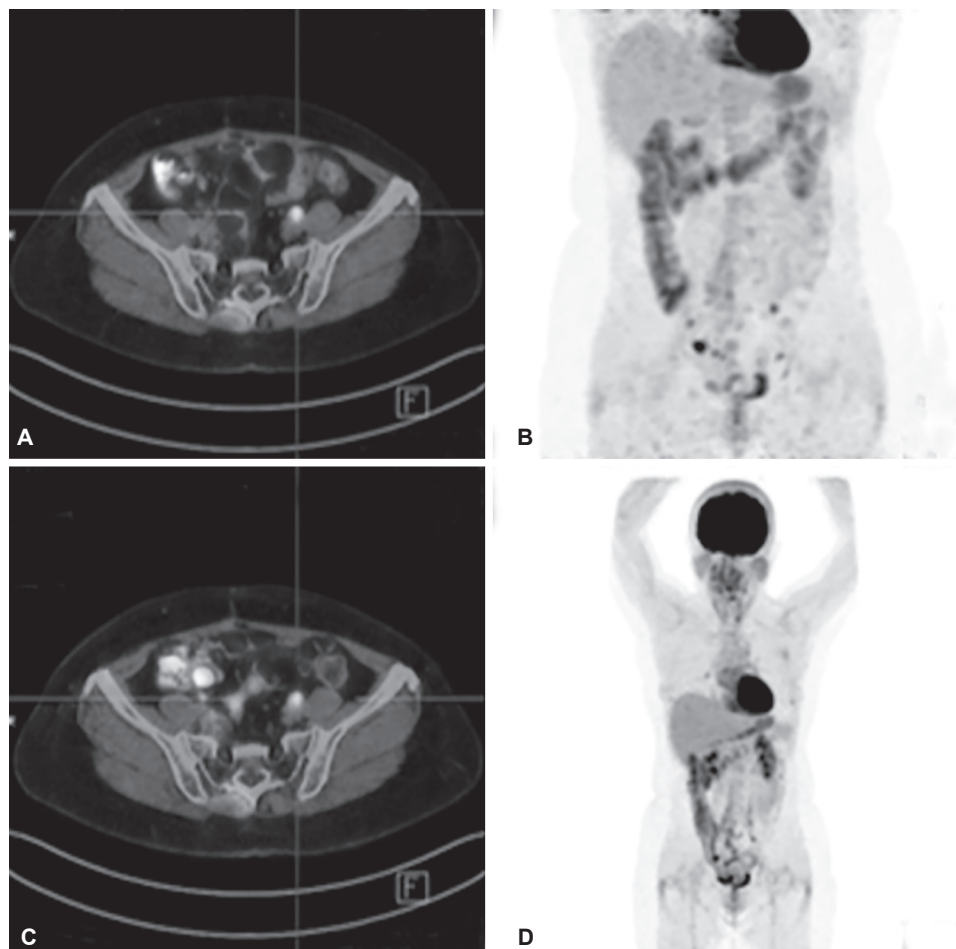
## DISCUSSION

The recurrence rate for early stage endometrial cancer is low. PET uses radiolabelled glucose analog 18F-FDG to detect increased glucose metabolism in malignant tumors.<sup>1</sup> 18F-FDG PET/CT scan has been used as a post-treatment surveillance imaging tool for gynecologic and breast cancer to detect recurrence due to high sensitivity, specificity, and

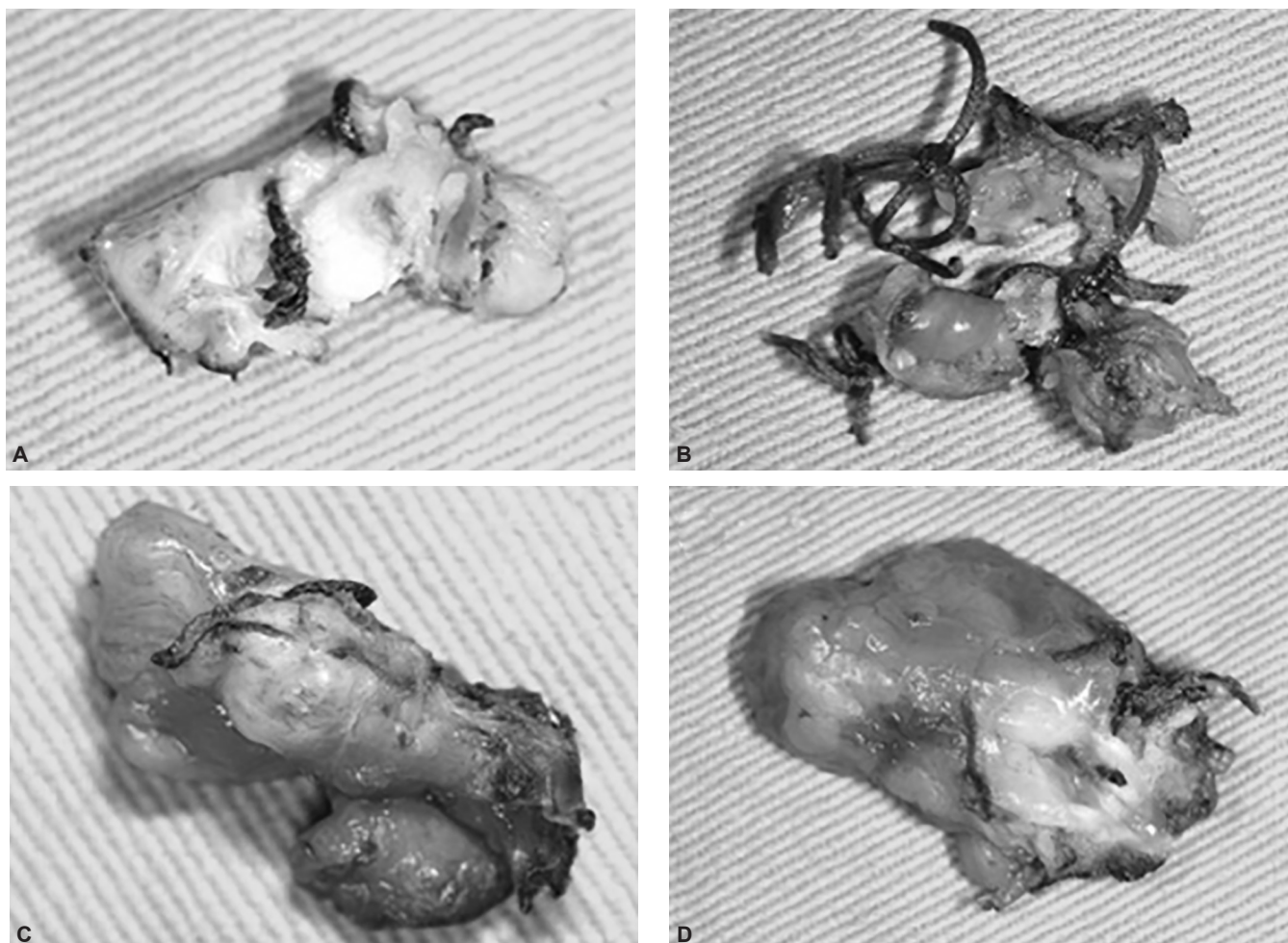
accuracy.<sup>4,7</sup> Bollineni et al. demonstrated the high diagnostic performance of 18F-FDG PET/CT not only in identifying lymph node metastasis preoperatively but also in detecting recurrence after endometrial cancer surgery with 95% sensitivity and 91% specificity with an overall diagnostic accuracy of 93%.<sup>2</sup> A systematic review and meta-analysis on the accuracy of 18F-FDG PET imaging on post-treatment monitoring of 541 endometrial cancer patients were reported to have 95.8% sensitivity and 92.5% specificity.<sup>8</sup>

Despite the high sensitivity and specificity of PET/CT scan, false-positive PET/CT results have been reported in the literature. Physiologic variations in FDG uptake in normal brown fat, skeletal muscles, laryngeal uptake, myocardium, uterus and ovaries, thyroid, testes, adrenal glands, thymus, breast, GI tract, and urinary tract could be interpreted as false-positive PET.

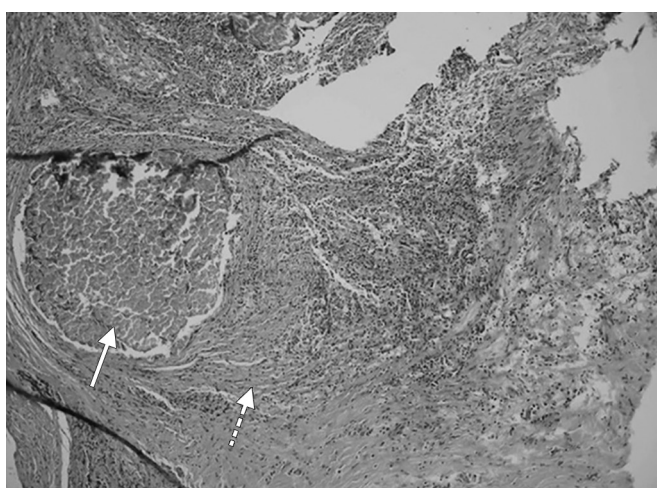
Moreover, tissues undergoing an infectious or inflammatory process like an autoimmune disease or granulomatous condition may have an increased uptake of FDG due to high glucose turnover from activated granulocytes, lymphocytes and macrophages present in these tissues leading to a false-positive result of PET/CT. Activated granulocytes, lymphocytes and macrophages have enhanced glycolysis due to an increase in glucose



Figs 1A to D: PET/CT scan showing abnormal uptake in the pelvic region



**Figs 2A to D:** Gross pictures of suture granuloma with silk sutures



**Fig. 3:** Microscopic picture showing cross section of the suture (arrow) surrounded by fibrosis (broken arrow)

transporters in these cells during the inflammatory process.<sup>9</sup> In the index patient, the inflammatory process from suture granuloma secondary to the usage of silk sutures caused the false positive PET/CT result.

Suture granuloma is formed when there is an inflammatory reaction secondary to delayed host response to a foreign body, which was the silk suture in the index case. In cases of post-surgical tissue, the normal healing

process is accompanied by an inflammatory reaction with leukocytic infiltration in the granulation tissue even in the absence of infection.<sup>9</sup> In suture granuloma, this inflammatory reaction is prolonged and heightened causing infiltration of more inflammatory cells.

Silk suture, which is a braided non-absorbable suture, has been reported to cause granuloma formation ranging from 0.6 to 7.1%.<sup>10</sup> which may occur for a few weeks up to years after surgery. It is thought to be due to a delayed host inflammatory reaction secondary to an infectious process in the wound leading to a delayed suture breakdown.

## CONCLUSION

Suture granuloma formation can cause abnormal radio-tracer uptake of 2-deoxy-2-[18F] FDG in PET/CT scan. It can be formed secondary to the usage of silk suture during surgery as part of a delayed host inflammatory reaction to a foreign body. Hence, in patients with early stage endometrial cancer with the usage of silk suture during surgery, with no other clinical or biochemical evidence of tumor recurrence, suture granuloma can be considered as a differential diagnosis.

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