



Macroplastique® for stress urinary incontinence lights up as a PET-avid urethral lesion: A case report

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ABSTRACT

Macroplastique® is a periurethral bulking agent used for the treatment of female stress urinary incontinence. It is composed of polydimethylsiloxane macroparticles suspended in a polyvinylpyrrolidone carrier to allow injection. The patient in this case report had increased 18F-FDG avidity on PET scan at the site of prior Macroplastique® injection. This avidity was likely due to a local inflammatory response and did not represent an occult malignancy. Keen clinical judgement is necessary when this PET-avid area is demonstrated in women with prior bulking therapy as this is an incidental benign finding that does not require further invasive management.

1. Introduction

Macroplastique® (Cogentix Medical, Minnetonka, MN, USA) is a proven safe and effective bulking agent used for the treatment of female stress urinary incontinence (SUI) since the early 1990s. [1] It is composed of permanent silicone-like elastomer polydimethylsiloxane (PDMS) beads suspended in polyvinylpyrrolidone, a gel carrier. Macroplastique® efficacy has been well studied and has self-reported success rates ranging from 40 % to 60 % and durable presence around the urethra based on follow-up translabial ultrasound studies. [1–5]

With concerns surrounding the use of mesh for urogynecological procedures, bulking therapy has become increasingly popular as an alternative to the mesh midurethral sling for SUI. [6–8] From this, it is inferred that more women are living with bulking agents such as Macroplastique® and thus it is important for clinicians and radiologists to be familiar with how this agent appears on various imaging modalities.

18F-Fluorodeoxyglucose (FDG) positron emission tomography (PET) can identify areas of hypermetabolic activity and thus is commonly used in cancer detection and screening. However, 18F-FDG uptake is also seen in benign tissues affected by inflammation or granulomatous disease. This was pathologically demonstrated in one woman who underwent excision of a suburethral mass six months after Macroplastique® injection. [9] The etiology of the 18F-FDG avidity in this situation is likely secondary to a granulomatous or inflammatory reaction that occurs in the tissue surrounding the PDMS implant.

Clinicians need to be aware of Macroplastique® avidity for 18F-FDG so that subsequent unnecessary and often invasive procedures can be

avoided. Herein, a case is presented of a woman with a history of lung adenocarcinoma and prior Macroplastique® injection who had increased uptake of 18F-FDG noticed in the bladder neck and urethra at the prior injection site.

2. Case Presentation

An 84-year-old woman with newly diagnosed lung adenocarcinoma had an 18F-FDG-PET/CT scan for cancer staging. In addition to PET avidity in the known left lung cancer, her study demonstrated a PET-avid lesion in the lower pelvis suggesting possible bladder neck or proximal vaginal primary pathology [Fig. 1]. A contrast-enhanced computed tomography (CT) scan from three years prior was reviewed for comparison which showed a similar-appearing enhancing lesion in the periurethral space corresponding to the lesion seen in the current PET/CT scan [Fig. 2]. Further review of her history revealed she underwent a prior hysterectomy and received periurethral Macroplastique® injection four years prior for bothersome SUI. Given the stable appearance of the lesion over the past three years and the location consistent with the site of prior Macroplastique® injection, it was highly suspected that this lesion corresponded to the injectable bulking agent and therefore no invasive tissue diagnosis was pursued. The patient ultimately underwent radiation therapy for the lung adenocarcinoma. Subsequent 18F-FDG PET/CT scan six months later again showed persistent, stable activity near the bladder neck consistent with the location of the prior Macroplastique® injection [Fig. 3].

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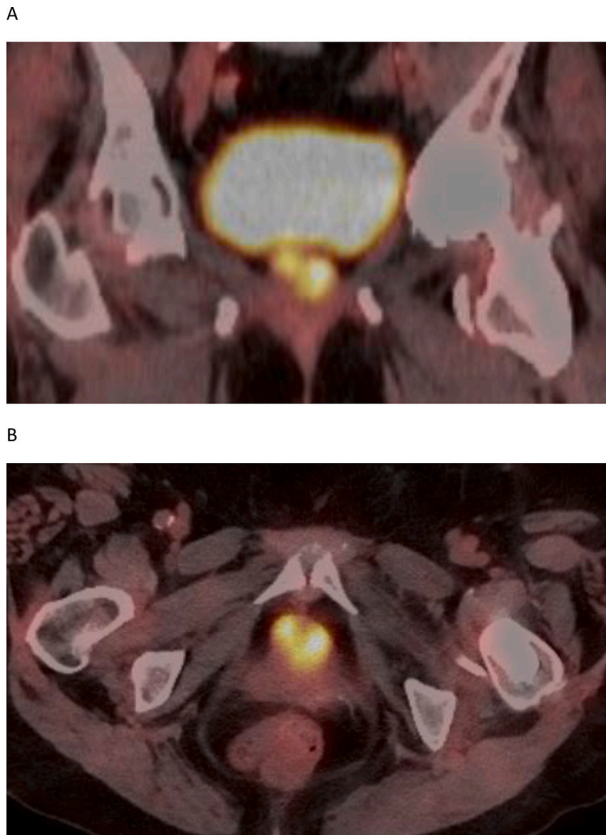


Fig. 1. 18F-FDG PET/CT images demonstrating increased tracer uptake in the pelvis inferior to the bladder.

3. Discussion

This case report is intended to alert clinicians and radiologists to the appearance of Macroplastique® around the urethra and bladder neck area on 18F-FDG PET imaging and to avoid unnecessary additional procedures such as biopsy or excision.

There have been previous reports of increased 18F-FDG activity in PDMS implants. One patient treated with Macroplastique® for post-prostatectomy incontinence had an 18F-FDG PET scan as part of the evaluation for gastric adenocarcinoma which showed intense 18F-FDG uptake in a periurethral mass. [10] Increased 18F-FDG uptake has also been shown after use of PDMS in VOX implants for treatment of dysphagia or vocal cord paralysis. [11,12] Unfamiliarity with this benign radiologic finding can lead to unnecessary biopsy or surgery, as occurred in one woman who ultimately underwent a radical hysterectomy and partial vaginectomy for a positive PET lesion in the vagina and bladder base in the setting of a prior Macroplastique® injection and history of rectosigmoid cancer – the final pathology of which was benign. [13]

Clinicians are often contacted regarding periurethral masses noted on CT scan, which frequently are linked to a prior injectable agent such as collagen, Durasphere®, Macroplastique®, or lately Bulkamid®. Some reports, shared via electronic medical reports with patients, raise concerns for a possible malignancy in that area which is a source of anxiety for these women already battling an active cancer condition. Therefore, it is important that the appearance of Macroplastique® on PET imaging be well recognized and not misconstrued as a rare vaginal or urethral cancer. This recognition will avoid unnecessary stress on the patient and her family as well recommendations for additional invasive testing or procedures.

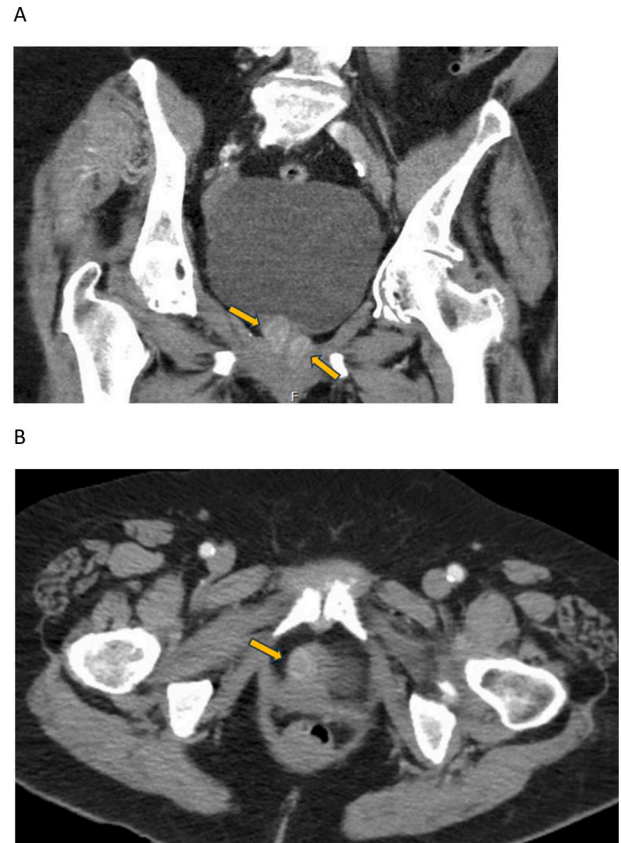


Fig. 2. Contrast-enhanced computed tomography images three years prior demonstrating enhancing lesion in the pelvis inferior to the bladder.

4. Conclusion

Macroplastique® bulking agent used for female SUI demonstrates increased 18F-FDG avidity likely secondary to an inflammatory reaction. Keen clinical judgement is necessary when this PET-avid area is demonstrated in a woman with a history of prior bulking therapy as this is an incidental benign finding that does not require further invasive evaluations.

Contributors

Christine Herforth contributed to patient care, conception of the case report, acquiring and interpreting the data, drafting the manuscript, undertaking the literature review and revising the article critically for important intellectual content.

Philippe E Zimmern contributed to patient care, conception of the case report, acquiring and interpreting the data, drafting the manuscript, undertaking the literature review and revising the article critically for important intellectual content.

Both authors approved the final submitted manuscript.

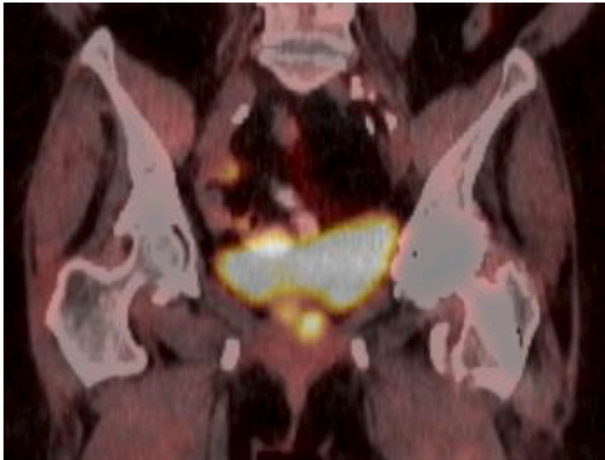
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Patient consent

The patient has consented to the publication of the report and all accompanying images.

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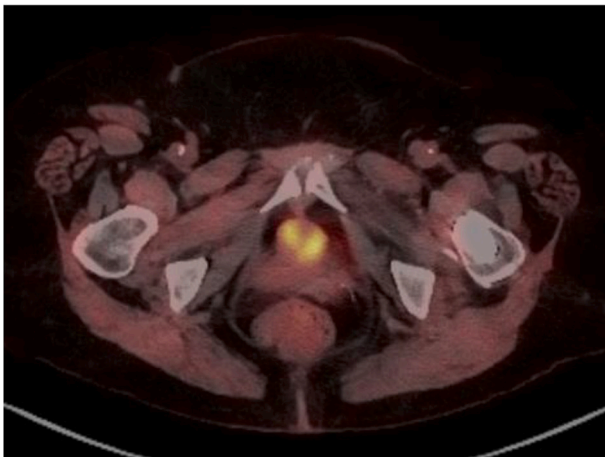


Fig. 3. 18F-FDG-PET/CT images after radiation for lung cancer with unchanged tracer uptake at the site of prior Macroplastique® injection 6 months later.

Provenance and peer review

This article was not commissioned and was peer reviewed.

Conflict of interest statement

The authors declare that they have no conflict of interest regarding the publication of this case report.

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