Utility of FDG-PET CT scan to detect an incidental rare recurrence of carcinoma urinary bladder following radical cystectomy

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DESCRIPTION

A 58-year-old man, known case of muscle invasive high-grade urinary bladder cancer, underwent radical cystectomy with extended pelvic lymph node dissection and ileal conduit diversion 2 years ago. Histopathology showed urothelial cancer with detrusor muscle invasion, grade 2, all margins, prostate and lymph nodes, were free of tumour. There was no evidence of carcinoma in situ elsewhere. The patient was on regular follow-up and six monthly CT imaging; renal, liver functions and chest X-ray showed no evidence of recurrence. At 2-year interval follow-up, the patient was doing well with no major concerns. As the patient was not able to follow-up at our centre due to emerging COVID-19 pandemic situation, he consulted a urologist at a private centre and was advised for fluorodeoxyglucose (FDG)-Positron Emission Tomography (PET) CT scan. To our surprise, FDG-PET CT scan showed FDG avid multiple enhancing soft tissue masses (Standard Uptake Value (SUV) max=7.4) in the penile and bulbar urethra suggestive of urothelial cancer recurrence (figure 1). There was no evidence of recurrence elsewhere. The patient was admitted at our centre and was evaluated further. Urethroscopy showed multifocal papillary tumours in penile and bulbar urethra and biopsy of the lesion confirmed high-grade urothelial cancer. Routine work-up including hemogram and renal and liver functions was normal. Conventional contrast enhanced CT imaging showed no tumour recurrence along the course of urethra (figure 2). Multidisciplinary team approach including radiologist, pathologist and oncologist opinion was taken.

Figure 1 Fluorodeoxyglucose (FDG)-PET CT axial section showing FDG avid enhancing multiple soft tissue masses along the length of urethra. PET, Positron Emission Tomography.

Figure 2 Conventional CT abdomen axial image showing no evidence of tumour in the urethra.

In view of localised recurrence of disease in urethra only, the patient was counselled and consented for urethrectomy. Under spinal anaesthesia, midline perineal incision was given. Urethra was mobilised all the way from external urethral meatus to proximal most limit up to membranous urethra and excised (figure 3A,B). Haemostasis was achieved and the wound was closed with vicryl 2-0 sutures. Histopathology showed high-grade urothelial cancer with muscularis propria invasion, absence of carcinoma in situ and margins were free of tumour. At 1-year follow-up, the patient is doing well and FDG-PET CT scan shows no evidence of recurrence of disease.

Detection of local recurrence and distant metastasis continuous to be a significant problem

Figure 3 (A, B) Gross and cut specimen of the urethrectomy showing multifocal papillary tumours in penile and bulbar urethra.

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following radical cystectomy and portends poor prognosis.¹ To add on, there is a need for a diagnostic test which can offer high sensitivity and specificity in predicting local/distant recurrence or residual disease in carcinoma urinary bladder. The most distinctive feature of the cancer tissue is that it shows a higher glucose metabolism than normal tissues.² Harney *et al* were the first one to demonstrate a high uptake of FDG in cancerous lesions of urothelial cancers.³ Öztürk and Karapolat reported that FDG-PET CT scan efficiently detects local recurrence and distant metastases with high sensitivity and positive predictive value in the restaging of patients who underwent radical cystectomy for

carcinoma urinary bladder.⁴ Guney *et al* also reported that FDG-PET CT scan is superior to other imaging modalities not only in distant localisations but also in evaluating pelvic lesions and lymph nodes.⁵

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Patient's perspective

I acknowledge the guidance and treatment provided by my doctors and staff during hospital stay and follow-up.

Learning points

- Isolated urethral recurrence following radical cystectomy in carcinoma urinary bladder is very rare.
- Conventional CT imaging and urethral wash cytology may not pick up the lesion.
- Fluorodeoxyglucose-PET CT scan is a useful adjunct to detect recurrences at unusual sites such as urethra.

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