Multiple Skeletal Muscle Metastases in a Case of Transitional Cell Carcinoma of Bladder Detected by F-18 FDG PET/CT

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Abstract We present a case of poorly differentiated muscle invasive transitional cell carcinoma in a 64-year-old male diagnosed with FDG-avid mass in the urinary bladder wall and multiple skeletal muscles visualised on F-18 FDG PET/CT.

Keywords TCC · Skeletal metastasis · PET/CT · F-18 FDG

Introduction

Transitional cell cancer occurs most commonly (90%) in the urinary bladder and represents the most common type of cancer in the bladder. Approximately 5% of cases have metastasis at presentation. Most common sites of spread are lymph nodes and skeleton. FDG PET may not be useful in staging the tumour extent or the depth of invasion, but it is very useful in the detection of nodal and distant metastasis especially when the primary tumour shows muscle invasion in the bladder wall.

Case Report

A 64-year-old male patient diagnosed to have poorly differentiated muscle invasive transitional cell carcinoma

was subjected to F-18 FDG PET/CT for staging prior to further management. FDG PET/CT was performed 60 min after intravenous injection of 10 mCi of F18-FDG. Intense FDG uptake was noted in the periphery of a heterogeneously enhancing mass measuring 6.0×3.3 cm in the right lateral wall of the bladder with loss of fat plane from the seminal vesicles with areas of calcification (Figs. 1 and 2a). Involvement of multiple retroperitoneal lymph nodes, pancreas, liver, chest wall, right adrenal gland, both kidneys, multiple bones and brain was also noted (Fig. 1). Intense FDG uptake was noted in ring-enhancing lesions in right adductor brevis, quadriceps femoris, and medial head of the gastrocnemius muscle, and left quadriceps and semitendinosus muscle (Figs. 1 and 2).

Discussion

Skeletal muscle is a rare site for metastasis due to its high resistance to cancer cells. This high resistance of muscle to cancer cells has been attributed to factors such as contractile activity, pH changes, oxygenation, lactic acid accumulation, intramuscular blood pressure and mechanical interactions within the microvasculature. Several case reports of skeletal muscle metastasis have been published. Thigh and calf muscles are common sites and the majority of the cases are secondary to lung carcinoma [1]. Other tumours producing metastasis to skeletal muscle include osteogenic sarcoma [2, 3], melanoma [4], adenocarcinoma of colon [5], stomach [6], ovary [7], leiomyosarcoma [8], mesothelioma [9] and nasopharyngeal carcinomas [10]. Metastasis from transitional cell carcinoma to brain [11], skin [12] and pericardial effusion [13] are also described. Skeletal muscle

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Fig. 1 Maximum intensity processing (MIP) image of the whole body up to pelvis (**a**) and lower extremities (**b**) showing widespread metastases including metastatic deposits in the lower limbs

Fig. 2 Fused PET/CT image showing FDG uptake in the **a** periphery of the bladder tumour, **b** adductor muscles on the right side and quadriceps on the left, **c** gastrocnemius on the left side, and **d** quadriceps femoris on the right side

metastasis from transitional cell carcinoma of bladder has been reported only by Nabi et al. [14]. We add to the literature another case involving skeletal muscle metastasis, documented using FDG PET/CT.

Conflict of Interest The authors declare that they have no conflict of interest.

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