Interesting images

**Needle track recurrence after transrectal prostate biopsy detected by $^{18}$F-Choline PET–CT**

**Siembra tumoral secundaria a una biopsia transrectal de próstata detectada por $^{18}$F-Colina PET–TC**

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**A R T I C L E  I N F O**

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A 72-year-old patient was referred to our department to carry out an $^{18}$F-Choline PET–CT due to biochemical PSA failure from prostate cancer. The patient’s prostate cancer history started 5 years ago when he was diagnosed of a Gleason 3 + 4 tumor and treated with external radiotherapy. Three years later he presented biochemical failure and prostate tumor recurrence. Transrectal biopsy confirmed histological diagnosis of local recurrence (Gleason 4 + 5). The patient underwent salvage temporal high-dose-rate brachytherapy (HDR-BT) treatment using an Iridium-192 ($^{192}$Ir) isotope. The PSA dropped to undetected levels. Fourteen months after salvage HDR-BT, a rising PSA was detected and reached 1.4 mg/dl before the PET–CT study was performed.

The PET–CT showed bone metastasis not present in a recent bone scintigraphy (not shown). Also, a focal hypermetabolism near the anterior wall of the rectum was discovered. The activity was difficult to localize due to lack of IV contrast on CT. A rectal MRI was requested for characterization and further localization of the lesion. The MRI showed a submucous lesion in the anterior wall of the rectum adjacent, but without communication with the posterior border of the prostate. This lesion was not present on previous MRI studies.

There was good correlation with PET–MRI fusion between the $^{18}$F-Choline uptake and the submucous lesion in the rectum (Fig. 1). A fine needle endoscopic biopsy was carried out and the pathological result was compatible with adenocarcinoma of prostate origin.

Choline PET–CT has recently shown promising results in the evaluation of patients with biochemical failure after therapy for prostate cancer.¹ Although most studies are carried out with $^{11}$C-Choline, similar cellular uptake and phosphorylation by choline kinase are observed with $^{18}$F-Choline. The longer half-life of $^{18}$F-Choline makes it a more available tracer; however, urinary excretion may interfere with visualization of abnormalities in the prostate, requiring dynamic acquisition shortly after IV injection.²

We present a case of prostate cancer recurrence in the rectum detected by $^{18}$F-Choline PET–CT. The mechanism of the recurrence is likely due to tumor seeding from the needle track of the transrectal prostate biopsy. Less likely is local lymphatic or hematogenous spread. On an MRI study carried out before the transrectal biopsy and the brachytherapy treatment (not shown) there were no signs of extraprostatic spread of the tumor.

Another possible mechanism is tumor seeding during the brachytherapy salvage treatment. This is also unlikely in our case. During HDR-BT, a transperineal approach was used for the temporary placement of $^{192}$Ir isotopes through flexible wires, without affecting the rectum.

Needle track seeding has been described in transperineal prostate biopsies but few cases have been reported in transrectal prostate biopsies. Tumors with a large volume, a high Gleason score and those resistant to hormone treatment are more likely to cause needle track seeding during prostate biopsy.³

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**Fig. 1.** PET axial image (a) of the pelvis, acquired 8 min after the injection of $^{18}$F Choline, shows focal uptake in the anterior wall of the rectum, shown in the PET–CT fusion image (b). Axial (c) and sagittal (e) T2-weighted images show hypointense nodule in the submucous layer of the rectum, which correlates with the PET uptake, as shown on the PET–MRI axial (d) and sagittal (f) images.

**References**

