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Video Article

Transrectal Needle Ablation in the Genitourinary Tract: Step-By-Step Description of A Novel Technique

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Introduction

Ultrasound (US) is often used to guide various interventional procedures in the Genitourinary (GU) tract because it can provide real-time imaging without any radiation hazard. Moreover, US can clearly visualize the pathway of an aspiration or biopsy needle to ensure the safety of the intervention. US guidance also helps clinicians to access lesions via the transabdominal, transhepatic, transvaginal, transrectal, and transperineal routes. Hence, US-guided procedures are useful for radiologists who wish to perform GU interventions [1]. US-guided thermal ablation has been accepted as an alternative treatment for liver [2,3] and thyroid tumours [4], because these organs provide a good sonic window. However, US cannot be used so readily to guide the treatment of renal and adrenal tumours using Radiofrequency Ablation (RFA) [5]. Minimally invasive local therapy possesses several dominant advantages, including minimal invasiveness, repeatability, and low incidence of side effects. RFA have been validated in animal experiments, and pathological examinations demonstrated that RFA can induce coagulative necrosis [6]. To our knowledge, there are no articles describing the technique of percutaneous ablation of a malignant lesion of the genitourinary tract using transrectal access in humans.

Procedure

Male patient, 58 years old, diagnosed with colorectal cancer and liver metastasis diagnosed 5 years ago. The primary tumor (colorectal) and liver lesions were resected in two stages. PET-TC shows a FDG capture lesion (Figure 1) measuring 2.5 x 1.5 cm located in the left seminal vesicle (SUV max = 5.67 / SUV late = 8.86). No further lesions were detected outside the seminal vesicle. In the pelvic MR we better define the dimensions of the lesion (Figure 2) and anatomical relationships. Percutaneous biopsy guided by endocavitary ultrasound was performed and confirmed to be a moderately differentiated adenocarcinoma (grade 2 histological) with tubuloacinar pattern and papillary foci infiltrating the seminal vesicle. After multidisciplinary discussion (Tumor Board) a minimally invasive treatment was chosen with percutaneous ablation guided by transrectal ultrasound outside the hospital environment due to the pandemic COVID-19 and an immunocompromised patient (Figure 3).

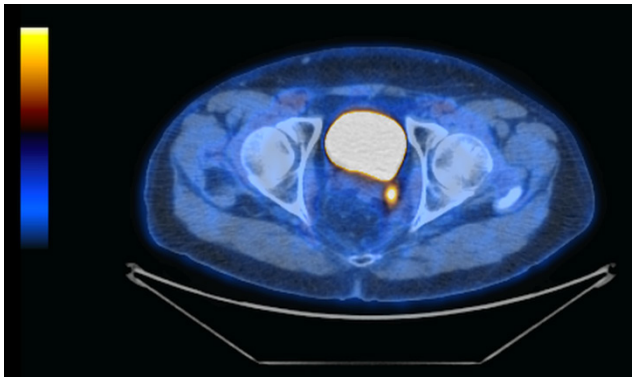

Figure 1: PET-CT showing FDG-capturing lesion located in the topography of the left seminal vesicle (arrow).

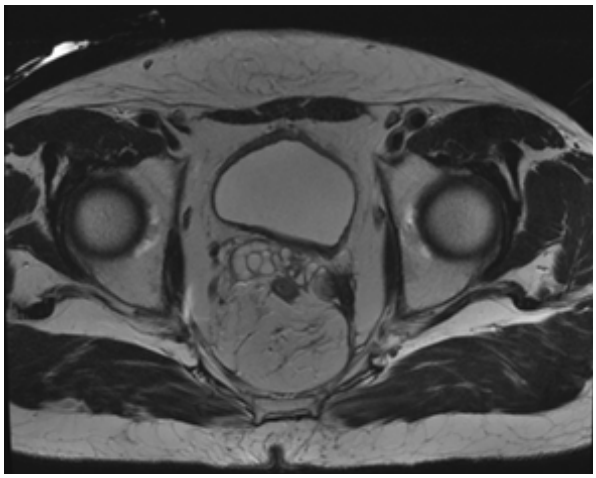

Figure 2: MR imaging of the pelvis, axial T2, demonstrating the lesion's morphological characteristics (arrow) and anatomical relationship with the bladder triangle.

Figure 3: Ablation procedure guided by endocavitary ultrasound showing the needle (red arrow) and the position on the side of the lesion (yellow arrow).

The procedure was performed under sedation and guided by transrectal ultrasound (Siemens Acuson S2000 ultrasound, Eindhoven, Netherlands), with Wide Bandwidth endovaginal transducer (4-9 MHz). Patient in left lateral decubitus position and guided by endocavitary ultrasound, the procedure was planned with identification of the lesion in the left seminal vesicle, as well as its anatomical relationships, mainly with ipsilateral distal ureter, prostate and bladder floor. We chose not to perform hydrodissection or perilesional infiltration with 5% glycated serum due to the favorable anatomy of the endocavitary approach. Percutaneous ablation was then performed using a 35 cm x 16G V-Tip needle (VCTM; http://www.rfa.co.kr/en, RF Medical Co., Ltd. Seoul, Korea). The RF energy was generated by a M-3004 RF generator (RF Medical). The ablation was used with an active needle tip set to 1 cm with 10-second shots and the following parameters (Figure 4). The manual program with a power of 70W was used. The total time using the RF was 3 minutes and 3 seconds, with a total accumulated power (Watts per second) of 11172 at the end of the procedure. The average initial impedance was 80 Ω (Ohms). The temperature of the device was below 10 degrees throughout all the procedure. Medical discharge was given after 2 hours of procedure with the patient in good general condition and without complications. PET with 30 days shows no more evidence of anomalous FDG uptake in the tumor area in the left seminal vesicle demonstrating complete response (Figures 5,6).

Figure 4: RFA device and its parameters during the ablation procedure.

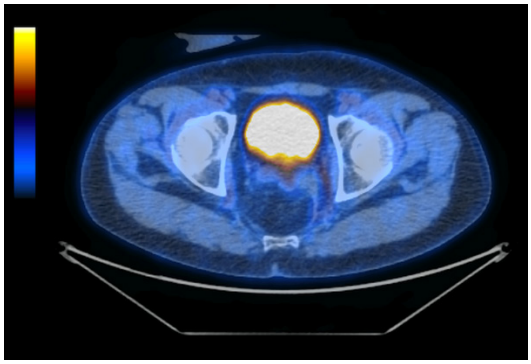

Figure 5: PET-CT control after 30 days showing absence of capture of the FDG previously located in the topography of the left seminal vesicle (arrow).

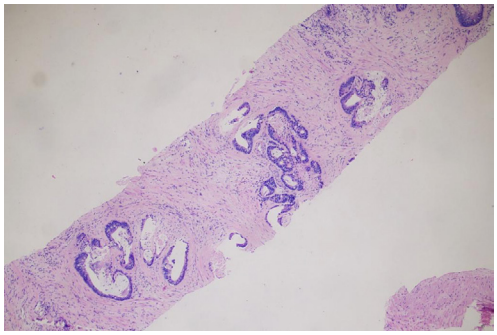

Figure 6: Anatomopathological analysis confirmed to be a moderately differentiated adenocarcinoma with tubuloacinar

pattern.

Comments

US guidance is useful for ablation in the treatment of GU tract diseases. Radiologists should be familiar with the basic principles and various techniques of US-guided GU interventions. As such, radiologists can improve the diagnostic or therapeutic outcomes of US-guided procedures conducted in the GU organs.

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