Case report

Penile masses: Shear Wave Elastography correlated with Magnetic Resonance Imagining. A two cases report.

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Abstract

Definitive diagnosis of penile masses usually depends on clinical symptoms and patient history but in some challenging cases the help of radiologic diagnostic tools is required. Although ultrasound is an effective tool for detecting penile masses, unlike magnetic resonance imagining, it is not able to differentiate benign and malignant pathologies. Shear wave elastography (SWE) is a novel method, which has the ability to differentiate malignant and benign tissues by giving quantitative information about tissue elasticity. In this paper we present two cases with penile masses to demonstrate the potential use of SWE in the differential diagnosis of penile masses.

Keyword: MRI, Penile mass, SWE

Introduction

The penis is predominantly a superficial organ, thus clinical evaluation and definitive diagnosis of penile pathologies usually is not challenging. In most of the cases clinical symptoms such as pain, edema, and enlargement together with a detailed history of patient and physical examination can lead to the definitive diagnosis. However, there are some problematic cases where the assistance of diagnostic tools such as ultrasound (US) and magnetic resonance imagining (MRI) is required [1]. US is the first choice of imaging in penile pathologies due to its accessibility, low cost, and effectiveness in the diagnosis. However, US is not sufficient in the differential diagnosis of benign and malignant masses of penis. MRI is an alternative modality for penile pathologies and it provides high-resolution images of the penis and is superior to US in the differentiation of malignant and benign masses [1,2]. However, due to the long examination time and higher costs, it is not possible to use MRI in daily practice. Shear wave elastography (SWE) is a novel imaging modality, which could give quantitative information regarding the stiffness of tissues and is found effective in the diagnosis of several pathologies including liver fibrosis and malignancies of the breast, thyroid and prostate [3,4]

In this paper we will present two cases with penile masses which were evaluated by SWE in addition to MRI to show the possible role of SWE in the differentiation of benign and malignant masses.

Case 1

A 31-year-old man presented with penile curvature and pain during erection. The patient was referred to our clinic for Doppler US examination with suspicion of Peyronie’s disease. In gray-scale imaging an expansile mass was noticed in the left corpus cavernosum (fig 1a). Detailed history revealed a recent vigorous sexual intercourse. Mean elasticity value of the lesion was measured as 86 kPa, which is slightly higher than the contralateral normal corpus cavernosum (mean elasticity value of 26 kPa) (fig 1b). A hypointense lesion was seen in the left corpus cavernosum in the axial fat-sat T1 weighted MRI. The key finding was disruption of the low signal intensity
tunica albuginea, indicating a hematoma, secondary to penile fracture (fig 1c). The patient was referred to our urology department and the surgery confirmed our diagnosis.

Case 2

A 67-year-old man, cystectomized with the diagnosis of bladder cancer, was admitted to our clinic with palpable penile masses. Multiple hypoechoic cavernosal lesions were revealed on the US. Mean elasticity value of one of the cavernosal masses were measured as 299 kPa, which was significantly higher than the normal corpus cavernosum (37.8 kPa) in SWE (fig 2a). In MRI examination, lesions were hypointense in T1 fat saturated and T2 sequences, and they showed heterogeneous contrast enhancement (fig 2b). In light of US and MRI findings, the first diagnosis that came into mind was metastasis. Pathological investigation of the penectomy specimen revealed multiple metastasis of the primary bladder cancer and confirmed our initial diagnosis.

Discussions

Penile cancer is an uncommon disease and most of them are primary squamous carcinomas [5]. Secondary penile cancer, as a result of systemic metastasis is a rare condition and is usually secondary to malignancies of the pelvic region [5]. Bladder and prostate are the most common primary organs of penile metastasis [5]. Since almost all penile primary cancers start in the skin cells of the penis, early diagnosis of primary cancers is usually not a challenging entity for clinicians. However, secondary penile cancer is usually a deep disease that does not develop as a superficial skin lesion and usually early diagnosis is more difficult [5]. Penile fracture on the other hand is a urological emergency caused by blunt trauma to the penis during erection. Significant pain, swelling, and hematoma are common presenting symptoms. Although patient history is usually enough for the diagnosis of the swelling; adequate clinical examination may not always be possible or may be inconclusive in some situations.

Since the penis is a superficial structure, US is an ideal diagnostic tool for the imaging of penile masses. Although US has a high sensitivity to detect penile lesions, it is not able to differentiate benign and malign lesions accurately. Agrawal et al showed that US is not able to establish a specific pattern for echogenicity between benign and malignant lesions. SWE is a medical imaging modality that maps the elastic properties of soft tissues. The main idea is that whether the tissue is hard or soft, diagnostic information regarding the presence or status of the disease can be obtained [6]. Malignant pathologies are usually harder than the surrounding tissues, whereas benign pathologies are usually not, and this feature can be used for the distinction of benign and malignant tumors [7]. In our cases, although mean elasticity values of both of the lesions were higher than parenchyma, mean elasticity values of metastatic lesions were significantly higher than the hematoma. Since there are no data about SWE of penile masses in current literature, we do not have a cut off value for malignant and benign lesions. But in our opinion SWE is a potential tool for the differential diagnosis of solid masses, hemato-
mas and, probably, other pathologies as well. Further studies are required to define the utility and limits of SWE in the diagnosis of penile masses.

In conclusion, penile masses, although rare, sometimes could constitute a diagnostic challenge in routine practice. History of the patient and clinical evaluation often leads to an estimation of the cause but in some situations, imaging modalities are needed for the definitive diagnosis. MRI often aids in the diagnosis but it is costly and time consuming. SWE seems to be a potential alternative for MRI in the differential diagnosis of benign and malignant penile masses.

References


