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Case report

Solitary fibrous tumour of the epididymis: MRI features

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Abstract. We present a case of a solitary fibrous tumour, located at the epididymis, in a 65-year-old man, presented with a scrotal mass. Ultrasound and MRI of the scrotum revealed a paratesticular mass, with rich vascularity, arising in the left epididymis. Radiological findings were non-specific and the patient underwent surgery.

Solitary fibrous tumour (SFT) is a rare mesothelial tumour that was first described as a pleural lesion. Over the past 15 years SFTs have been recognized in many extrathoracic sites, including the orbit, upper respiratory tract, salivary glands, thyroid, peritoneum, retroperitoneum, liver, adrenal, kidney, urinary bladder and prostate [1–3], spermatic cord [4, 5], paratesticular area [6–8], soft tissue, abdominal wall, spinal cord, and meninges. In this article we present a case of SFT arising in the epididymis, which to our knowledge is a location not previously reported in the English literature. We present the ultrasound and MRI findings, with emphasis on the latter. Additionally, a review of the literature on the MRI features of the various paratesticular masses is presented, although there is limited experience on this topic.

Case report

A 65-year-old man admitted to the Urology department for a mass in the left hemiscrotum, noticed during self-examination, 3 months prior. He reported an episode of treated epididymoorchitis on the same side, 36 months previously. Clinical examination revealed a tender, firm mass, probably arising outside the testis. The other hemiscrotum was normal. Serum markers for germ cell tumours (alpha fetoprotein, b-human chorionic gonadotropin, lactate dehydrogenase) were all negative.

Ultrasound examination showed a paratesticular mass in the left hemiscrotum. The mass was well circumscribed, ovoid, appeared solid and hypoechoic, compared with the testicular parenchyma. Colour Doppler assessment revealed rich tumour vascularity (Figure 1). The left testis appeared slightly hypoechoic compared with the other testis. The examination of the right hemiscrotum was normal.

Scrotal MRI was performed using fast spin echo T_2 weighted images in the axial, coronal and sagittal planes; unenhanced and contrast-enhanced T_1 weighted images were also obtained. A paratesticular ovoid mass was seen in the left hemiscrotum. The mass had signal intensity similar to and slightly lower than that of testicular parenchyma on T_1 and T_2 weighted images, respectively (Figure 2a–c). It was well demarcated, surrounded by a low signal intensity capsule. Its relationship with the epididymis was clearly seen on sagittal images. The left testis was slightly inhomogeneous and the tunica albuginea appeared intact. The right testis was normal. After intravenous administration of gadolinium chelate the mass enhanced strongly and homogeneously (Figure 2d). A CT scan of the abdomen and thorax was performed and showed no evidence of metastases.

At left inguinal exploration a hard mass was seen in the paratesticular region. Enucleation of the lesion was impossible, and an orchiectomy was performed. At gross histological examination, a fairly well circumscribed, firm, grey-white mass, with whirling and fasciculation was seen on cut sections of the epididymis. The mass was separated from the tunica albuginea with a thin fibrous capsule. Microscopically a circumscribed lesion with variable cellularity was found in the epididymis. It consisted of a tangled network of fibroblast-like cells, with deposition of abundant collagen fibres. The nuclear atypia was slight/moderate and the maximum number of mitoses was 3/10 high power fields (HPF). Necrosis was not evident. On immunohistochemical studies the neoplastic cells stained strongly for vimentin and CD34. The left testis showed signs of atrophy. Based on the morphological and immunohistochemical characteristics, the diagnosis of SFT was made.

The patient had an uneventful recovery and remains well, 10 months now after surgery.

Discussion

SFTs, regardless their site of origin, usually follow a benign clinical course; however they can recur and metastasize after surgical resection The rate of local recurrence or distant metastases to liver, lung, retroperitoneum, or bone is approximately the same for intrathoracic and extrathoracic SFTs, and it is about 10% [6]. Histological features associated with local or distant recurrence include a high cellularity, mitotic activity >4/10 HPF, nuclear pleomorphism, presence of necrosis and positivity for p53 [4, 6]. These features individually do not inevitably imply malignant clinical behaviour, since up to 60% of benign cases may show at least one such feature. Our patient is free of recurrence or

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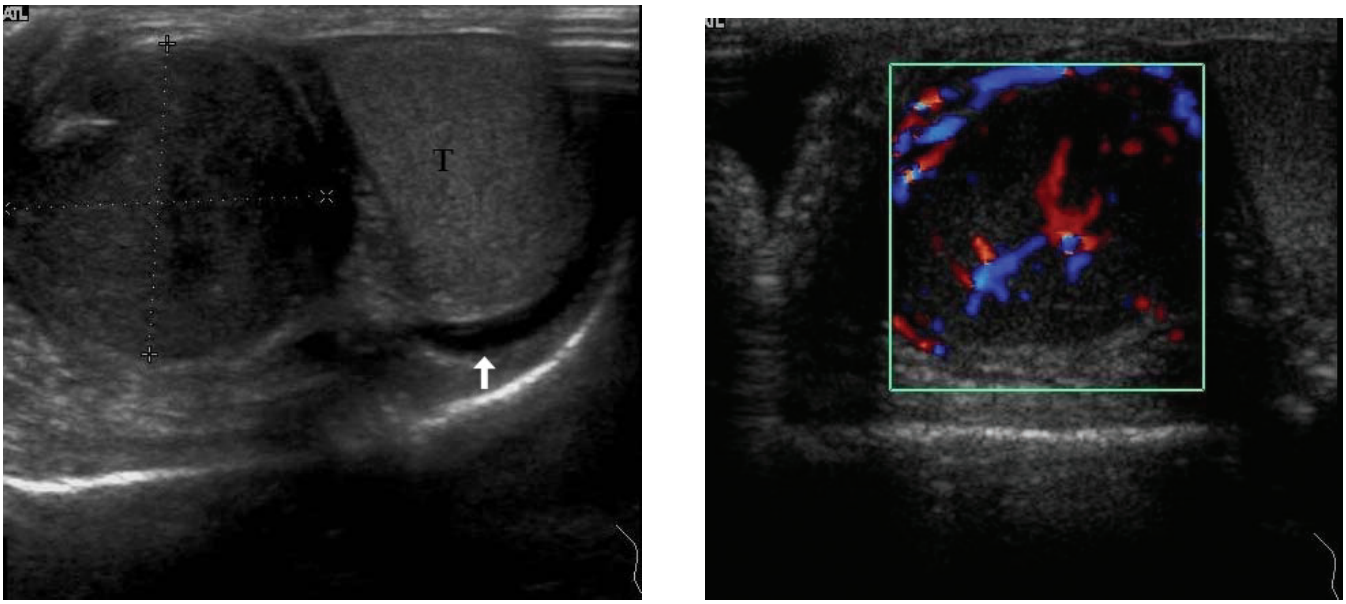

(a) (b)

Figure 1. (a) Transverse ultrasound of the left hemiscrotum shows an ovoid, sharply demarcated, hypoechoic mass, measured 1.8 cm × 1.9 cm (cursors), located outside the testis (T). A small hydrocele is also seen (white arrow). (b) Colour Doppler examination shows rich tumour vascularity in the centre and at the periphery.

distant metastases for 10 months now after surgery. However a careful, long-term follow-up is required in all these cases.

The diagnosis of SFT is made on the basis of its histological features, supported by immunohistochemical studies, as in our case. Radiographic findings are non-specific and the pre-operative diagnosis is difficult.

In our patient MRI study showed a lesion involving the epididymis. The mass had intermediate signal intensity on T_1 weighted images and signal intensity slightly lower than that of testicular parenchyma on T_2 weighted images. The tumour was surrounded by a low signal intensity halo, corresponding to the fibrous capsule, seen on histology and enhanced after gadolinium administration, due to its high vascularity.

MRI allows the precise demonstration and localization of scrotal masses, including the anatomical relationship to the surrounding structures, as in our case. The literature concerning the MRI characteristics of paratesticular tumours is limited [9, 10]. The vast majority of paratesticular masses are benign lesions of the epididymis, like cysts or spermatoceles, scrotal fluid collections, like hydroceles and pyoceles, inflammatory lesions and hernias. The MRI findings of the spermatocele may be diagnostic. The lesion may be seen as a unilocular or multilocular paratesticular mass, of low signal intensity on T_1 weighted images and high signal intensity on T_2 weighted images, not enhancing after gadolinium administration [11, 12]. But this is not always the case, and differentiation from tumours may not be possible [10]. In cases of epididymitis MRI shows enlargement of the epididymis, which appears heterogeneous, of medium signal intensity on T_1 weighted images and of slightly high signal intensity on T_2 weighted images. The spermatic cord is enlarged, oedematous, with increased vascularity [13]. Imaging findings are non-specific and differentiation between non-specific and specific inflammations, like tuberculosis or sarcoidosis is not possible [14, 15]. Hashiguchi et al [16] described the MRI findings of a case of isolated polyarteritis nodosa of the epididymis. MRI showed an enlarged epididymis, of low signal intensity on T_1 weighted images and of mixed high and low signal intensities on T_2 weighted images. After gadolinium administration the affected epididymis enhanced strongly. The findings resemble closely to those of inflammation. On T_2 weighted images there were also multiple small nodular or tubular structures within the epididymis, with an inner high signal intensity and an outer low signal intensity. Some of the lesions showed a flow void centrally. The above findings corresponded histologically to the remarkably thickened arterial walls and may be considered specific for the diagnosis of polyarteritis nodosa.

Lipoma is the most common benign neoplasm of the paratesticular tissues and of the spermatic cord, accounting for 45% of paratesticular tumours. The tumour is easily recognized on MRI, owing to its characteristic signal intensity, bright on T_1 weighted images [9] and low signal intensity on fat-suppressed T_1 weighted images. Adenomatoid tumour is the most common tumour of the epididymis, followed by leiomyoma. Pre-operative diagnosis of these tumours, based on MRI features is difficult. Patel et al [17] described the MRI findings of an adenomatoid tumour of the tunica albuginea, appeared as a mass slightly hypointense to testicular parenchyma on unenhanced images. The tumour showed internal enhancement less than that of the normal testis, after gadolinium administration. Fibrous pseudotumour is not a true neoplasm but a reactive proliferation of paratesticular tissues. The mass may have low signal intensity on both T_1 and T_2 weighted images, because of fibrosis [10] and does not enhance after gadolinium chelate administration [9]. In the adult patients the differential diagnosis of paratesticular tumours should include sarcomas, like leiomyosarcoma, fibrosarcoma and liposarcoma. These neoplasms are

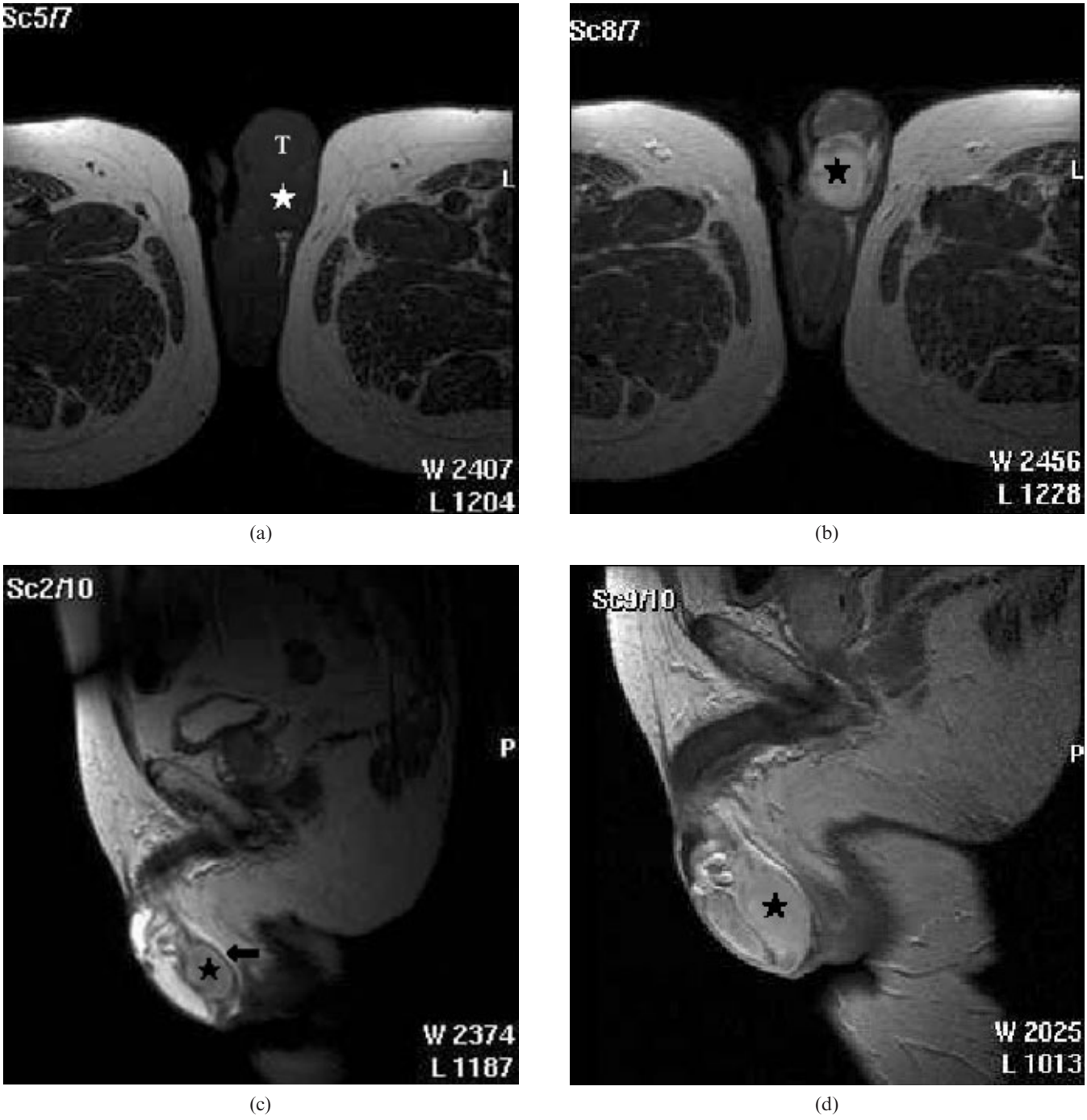

Figure 2. (a) Transverse T_1 weighted image (repetition time/echo time (TR/TE), 650/15) shows a paratesticular mass (asterisk) in the left hemiscrotum, with signal intensity similar to that of testicular parenchyma (T). (b) Transverse and (c) sagittal T_2 weighted fast spin-echo MR images (TR/TE, 4000/100) show the mass (asterisk) clearly as extra testicular, located at the area of the epididymis. It has lower signal intensity, compared with that of testicular parenchyma and surrounded by a low signal intensity capsule (arrow). (d) Sagittal post-contrast T_1 weighted image. The mass (asterisk) enhances strongly and homogeneously.

very rare and the diagnosis based on imaging findings is difficult. Finally metastases, most commonly from testicular, prostatic, renal and gastrointestinal primary neoplasms should be considered, especially if there is a history of primary malignancy.

In conclusion the pre-operative diagnosis of paratesticular tumours is difficult. In some cases, however the MRI findings, always interpreted in conjunction with ultrasound features with respect to tumour location, morphology and tissue characteristics may help narrow the differential diagnosis.

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