Leydig cell tumour of the testis
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Section: Uroradiology & genital male imaging
Area of Interest: Genital / Reproductive system male
Procedure: Imaging sequences
Imaging Technique: Ultrasound
Imaging Technique: Ultrasound-Power Doppler
Imaging Technique: MR
Imaging Technique: MR-Diffusion/Perfusion
Special Focus: Neoplasia Case Type: Anatomy and Functional Imaging
Authors: Athina C. Tsili, Christina Naka, Vasilios Maliakas, Maria I. Argyropoulou
Patient: 32 years, male

Clinical History:
A 32-year-old male patient presented with a non-palpable right intratesticular mass, incidentally detected on ultrasound examination, due to subfertility. Laboratory analysis, including tumour markers, was unremarkable. MRI examination of the scrotum followed.

Imaging Findings:
Sonography of the scrotum revealed the presence of a small right intratesticular mass lesion, measuring 7 mm in maximal diameter (Fig 1). The mass had well-defined margins and mainly low echogenicity, when compared to normal testicular parenchyma. Power Doppler examination showed rich lesion vascularity (Fig 1b).
MRI of the scrotum showed right testicular lesion involving the interlobar region, mainly hypointense and isointense on T2WI and T1WI, respectively (Fig 3). No areas of restricted diffusion were revealed within the mass. An early, strong contrast-enhanced followed by gradual de-enhancement (type III curve) was detected on dynamic contrast-enhanced imaging (Fig 4). Right tunica albuginea was intact. The right paratesticular space and the ipsilateral spermatic cord were normal.

Discussion:
The histologic diagnosis of a benign Leydig cell tumour was made, following right orchiectomy.

Background
Leydig cell tumours (LCTs) are included in the category of sex cord-gonadal stromal tumours of the testis. They constitute approximately 4-6% of adult testicular neoplasms and 10-30% of testicular tumours in infants and children. These tumours are usually benign, malignant behavior occurs in about 10% of cases [1-4]. The widespread use of US has resulted in an increase of incidentally discovered non-palpable small solid testicular lesions, which up to 80 % of cases are benign, with LCTs being the most frequent [5, 6]. Testis-sparing surgery is
Imaging perspective

Characterisation of testicular mass lesions is initially made upon US examination. However, the sonographic appearance of LCTs is variable and often non-specific. Peripheral hypervascularity in a small, hypoechoic testicular mass, with little or no internal colour Doppler flow may suggest the possibility of a LCT [1, 8]. LCT may be suggested by the findings of a short filling time or by a circumferential vessel with a rapid centripetal filling on contrast-enhanced US, combined with a "harder" appearance in real-time tissue elastography, in cases of a small and peripherally located hypoechoic tumour [9, 10].

At conventional MRI, LCTs have been described as isointense on T1WI and hypointense on T2WI, with marked homogeneous enhancement. In addition, they may also demonstrate capsular high T2 signal and a high-signal-intensity central scar on T2WI. However, MRI findings are not sufficiently specific to allow confident exclusion of alternative diagnoses, especially testicular germ cell tumours [1, 3, 4, 11]. Data regarding DWI characteristics of LCTs are lacking.

Mangarano et al. reported an overall diagnostic accuracy of 93% for MRI in differentiating LCTs from testicular seminomas. The presence of a well-defined testicular mass, with markedly hypointense T2 signal, homogeneous contrast enhancement, rapid and marked wash-in, followed by a prolonged wash-out was considered as suggestive of the diagnosis of LCTs. On the contrary, seminomas had blurred margins, weak hypointense T2 signal, weak T1 hyperintensity and weak and progressive wash-in, with an absent wash-out [12]. Sanharawi et al. in a study evaluating the qualitative, semi-quantitative and quantitative parameters of non-palpable testicular tumours, incidentally found on US by dynamic contrast-enhanced MRI reported higher peak, shorter time to peak, higher initial enhancement slope, higher Ktrans and Kep for LCTs compared to seminomas [13].

**Differential Diagnosis List:** Leydig cell tumour of the testis, Leydig cell tumour, Leydig cell hyperplasia, Sertoli cell tumour, Seminoma, Non-seminomatous germ cell tumour

**Final Diagnosis:** Leydig cell tumour of the testis

**References:**


**Figure 1**

**Description:** Sagittal (a) Grey-scale and (b) power Doppler sonographic images of the right testis depict the presence of a small, well circumscribed intratesticular mass (arrow). The lesion is mainly hypoechoic, with rich vascularity. **Origin:** Tsili A, Department of Radiology, University of Ioannina, Greece
Description: Sagittal (a) Grey-scale and (b) power Doppler sonographic images of the right testis depict the presence of a small, well circumscribed intratesticular mass (arrow). The lesion is mainly hypoechoic, with rich vascularity. Origin: Tsili A, Department of Radiology, University of Ioannina, Greece
Figure 2

Description: Transverse (a) T2WI and (b) T1WI. The right testicular mass (arrow) appears mainly homogeneous, of low T2 signal. The lesion is barely imperceptible on T1WI. Origin: Tsili A, Department of Radiology, University of Ioannina, Greece
Description: Transverse (a) T2WI and (b) T1WI. The right testicular mass (arrow) appears mainly homogeneous, of low T2 signal. The lesion is barely perceptible on T1WI. Origin: Tsili A, Department of Radiology, University of Ioannina, Greece
Description: Transverse (a) DW MRI image and (b) the corresponding ADC map (b= 900 s/mm²). The lesion (arrow) appears hypointense and mainly isointense on DW images and ADC maps, respectively.

Origin: Tsili A, Department of Radiology, University of Ioannina, Greece
**Description:** Transverse (a) DW MRI image and (b) the corresponding ADC map (b= 900 s/mm²). The lesion (arrow) appears hypointense and mainly isointense on DW images and ADC maps, respectively.

**Origin:** Tsili A, Department of Radiology, University of Ioannina, Greece
Description: (a) Coronal subtracted dynamic contrast-enhanced image (early phase) demonstrates testicular lesion (arrow) enhancing strongly and homogeneously. Origin: Tsili A, Department of Radiology, University of Ioannina, Greece
Description: (b) Time-signal intensity curves. The tumour depicts early, strong upstroke enhancement, followed by gradual washout of the contrast medium (blue). The normal contralateral testis shows moderate, gradual linear increase of enhancement throughout the examination (red). Origin: Tsili A, Department of Radiology, University of Ioannina, Greece