



A rare case of bilateral testicular metastasis from ileocecal NET: multiparametric US detection

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Abstract

Testicular metastasis are rare findings and bilateral metastasis of testes are extremely rare. Here we are describing for the first time a case of bilateral testicular metastasis in a patient with a known ileocecal valve NET using an in-depth ultra-sound studying including microvascular flow imaging (MV-flow), ultra-sound new technique, able to detect small vessel slow-signal.

Keywords Bilateral testicular metastases · Ileocecal NET · Testicular tumor · Multiparametric US · MV-flow imaging

Introduction

Neuroendocrine tumors (NETs) are slow-growing malignancies occurring most frequently in the gastrointestinal tract and bronchopulmonary system. The gastrointestinal ones occur mostly in the small bowel (41.8% of gastrointestinal carcinoids), especially in the ileum (47.3% of small bowel carcinoids) [1].

The main target of metastases from small bowel NET are the liver and the regional lymph nodes [2], on the contrary testes represent very unusual sites. Ultrasound (US) imaging is the method of choice to examine the scrotum, providing information about volume, echotexture, tissue stiffness, macrovascularization and microvascularization, essential in the diagnosis of testicular tumors [3].

Besides, microvascular flow imaging (MVFI; MV-FlowTM, Samsung Medison Co., Ltd., Seoul, Korea), a new Doppler microvascular imaging, has been used for detecting

slow blood flow, increasing confidence in the evaluation of the lesion vascularity [4].

Case report

Here describe the case of a 59 years old male, with a story of ileocecal valve NET (G1) treated with ileal resection and ileocolic anastomosis, with multiple metastatic liver lesions showed at computed tomography (CT). He presented a non-painful palpable mass in the right testicle. Performed a US examination on RS85 ultrasound scanner (Samsung Medison Co., Ltd.) using LA2-14A linear array transducer. Performing B-mode scan, examined the testes in the sagittal and transversal axes finding multiple homogeneously hypoechoic or isoechoic nodular masses with regular shape in both testes, the greater ones about 10 mm with a peripheral halo, (Fig. 1) that showed predominantly peripheral hypervascularity at color-doppler (CDUS) (Fig. 2) and yellow areas, as intermediate elasticity stiffer than the surrounding parenchyma, at real-time sonoelastography (RTSE) (Fig. 3). The masses were also detected by MV-flow imaging and showed the presence of peripheral and central microvascular structures (Fig. 4). Then performed contrast-enhanced ultrasonography (CEUS) (Fig. 5) with a 2.4 mL contrast medium (SonoVue, Bracco Imaging, Milan, Italy) administered intravenously in the antecubital vein followed by a 0.9% saline flush (10 ml). It showed a late contrast enhancement of the masses, considered hypervascularization. All the described findings were highly suggestive for metastases,

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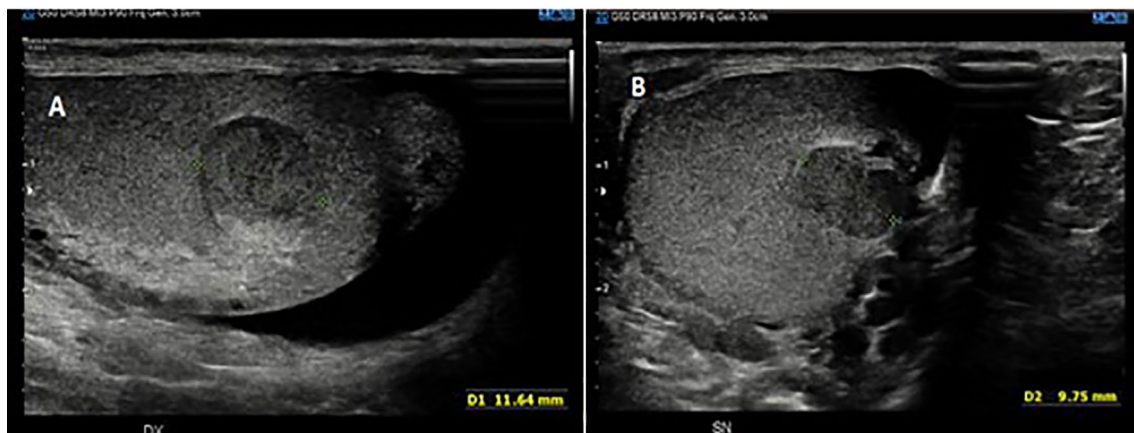


Fig. 1 US gray-scale image shows nodular masses with diameter about 10 mm with regular shape and a peripheral halo in right (a) and left (b) testicles

Fig. 2 US color-Doppler image shows peripheral vascularization of the mass



so the patient underwent a positron emission tomography (PET) that revealed an increased fluorodeoxyglucose (FDG) uptake in both testes, as well as liver and bone.

Discussion and Conclusion

Testicular metastasis is uncommon findings with an incidence of 0.9% in all testicular tumors [5]. Even more uncommon are bilateral testicular metastasis, most of them reported from prostatic carcinoma [6].

Only a few cases of metastasis from ileocecal carcinoid were reported in the literature at this moment and, to our

knowledge, bilateral testicular metastasis from ileocecal carcinoid has never been previously reported.

The US is the modality of choice to study the scrotum, with almost 100% sensitivity combined with history and physical examination [7]. Most testicular malignancy typically occur as nonpainful masses without specific features that differentiate primary from secondary tumors;

the multiparametric US can help to define some differences among the subtypes. According to Huang et al. [8], seminoma appears at the gray-scale US as a solid round homogeneous low-reflectivity, at CDUS shows vascularity within the lesion and on CEUS there is a rapid enhancement in the mass with a rapid washout of the contrast, but with the persistence of the abnormal crossing

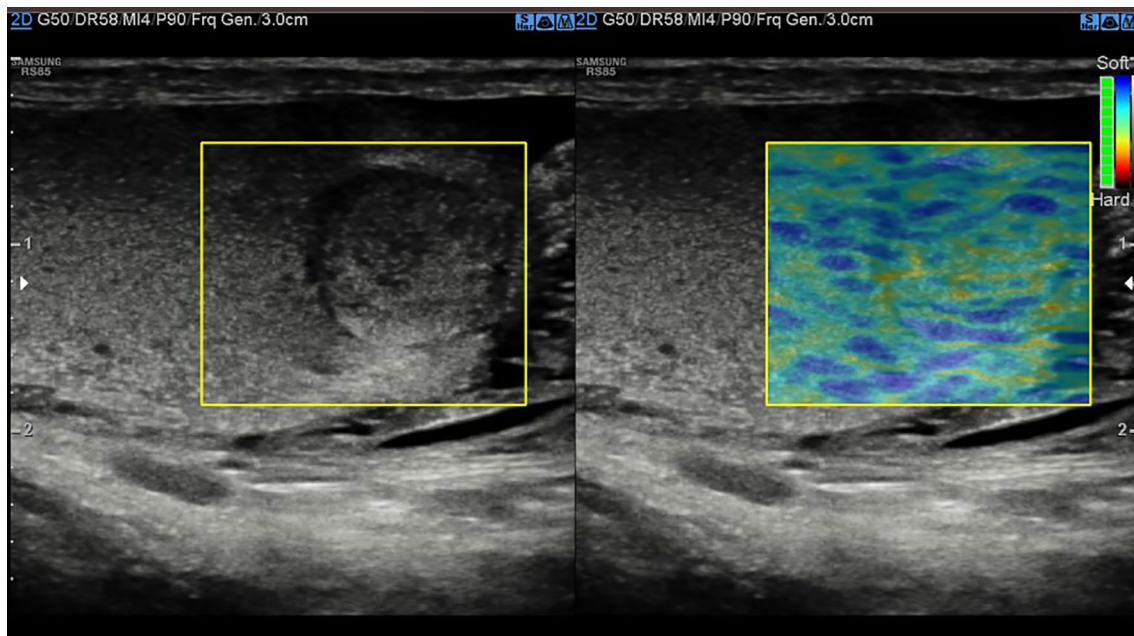


Fig. 3 US image shows intermediate elasticity stiffer at real-time sonoelastography (RTSE)

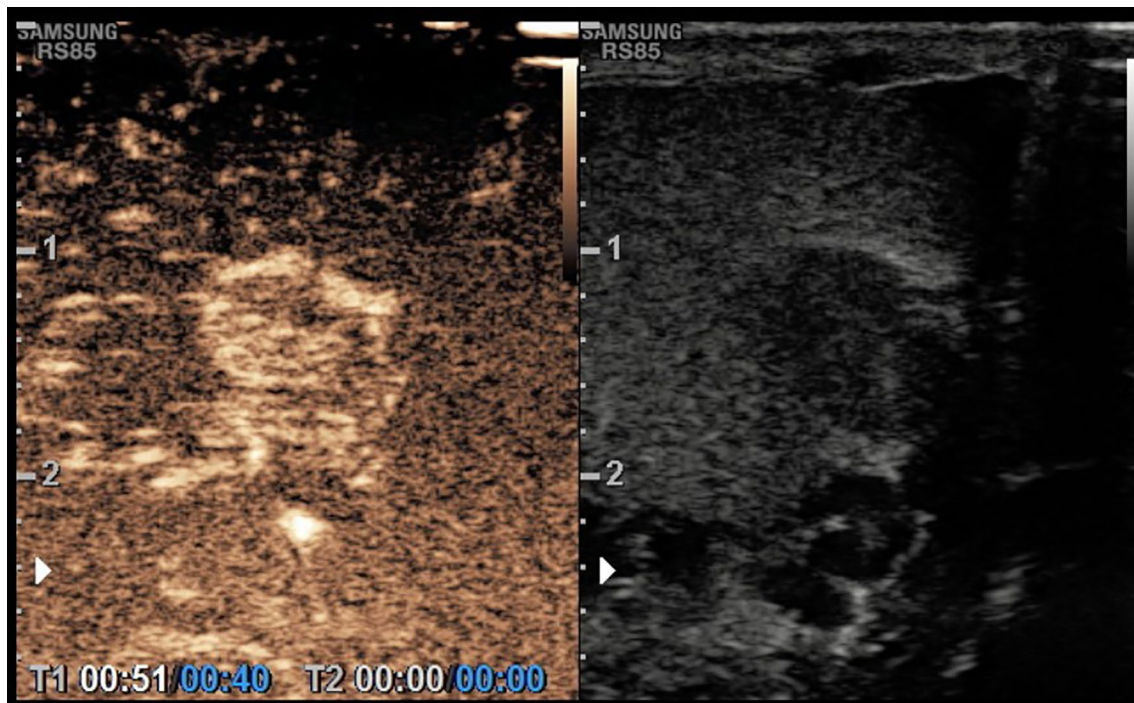


Fig. 4 contrast-enhanced ultrasonography (CEUS) image shows contrast enhancement of the mass

vessels within the lesion. The non-seminomatous germ-cell tumors on B-mode images may be inhomogeneous, with areas of increased echogenicity, calcification and cysts, CDUS may or may not show increased vascularity, on CEUS individual microbubbles may be seen within

the lesion in a haphazard pattern. Metastatic masses can appear as focal or multifocal hypoechoic nodular lesions with a halo [9] with internal vascularity within the lesions at CDUS confirmed at CEUS with internal and peripheral contrast enhancement. All the lesions demonstrate an

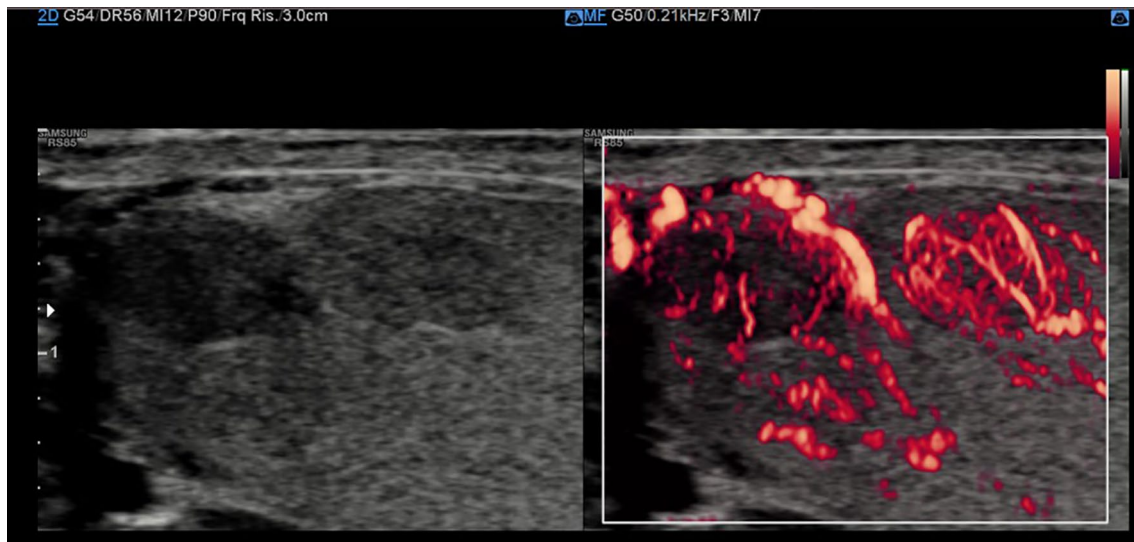


Fig. 5 US image shows masses neo-vascularity at MV-flow image

intermediate-hard elasticity stiffer on RTSE. The metastatic mass features found in our patient were similar to the ones described in the literature: homogeneously hypoechoic nodular masses with a peripheral halo and predominantly peripheral hypervascularity at CDUS, an intermediate elasticity stiffer at RTSE and a late contrast enhancement on CEUS. Besides, we performed the MV-flow imaging, for the first time on the testicles to our knowledge. This specific technique, already used in a limited number of studies [10–12] was able to depict the microvascular structures due to tumoral neoangiogenesis within the lesions.

Similar techniques to study testicular blood slow-flow were already reported using different scanner brands. Rocher et al. [13] described the feasibility of ultrasensitive Doppler (USD) on the Aixplorer US system (SuperSonic Imagine, Aix-en-Provence, France) that improved the detection of vascular architecture or the absence of any vessels in different testicular lesions. Lee et al. [14] used superb microvascular imaging (SMI) technique, on the Aplio 500 (Toshiba Medical System Corporation, Tokyo, Japan) to detect the perfusion difference between normal and undescended testes in young children.

In conclusion, the US is the method of choice to explore the scrotum since it is easily available, noninvasive, rapid to perform and economic. We believe that the multiparametric US is necessary in detecting as well as possible testicular abnormalities because every single technique can add useful information to improve the characterization of testicular lesions and to increase diagnostic confidence, especially for unusual findings as demonstrated in this case.

Declarations

Conflict of interest The authors declare that they have no conflict of interest.

Ethical statements and Informed consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki declaration of 1975, and its late amendments. Additional informed consent was obtained from all patients for which identifying information is not included in this article.

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