Case report

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Cutaneous histiocytoma – histological and imaging correlations. A case report.

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Abstract

Dermatofibroma (benign fibrous histiocytoma) represents one of the most common skin tumors. We present the case of a 52 year old female patient with a highly pigmented nodular lesion, localized on the right thigh. Dermoscopy completed the clinical diagnosis, but could not exclude a malignant tumour . Ultrasound examination (Dermascan C sonograms 20 MHz, 2D ultrasound, Doppler ultrasound, contrast enhanced ultrasound, and elastography) evidenced a highly vascularized lesion (peripheral type of vascularization), and a sonographic depth index of 8.3 mm. The histopathological examination confirmed the diagnosis of a benign fibrous histiocytoma with the histological Breslow index of 8 mm. The particularity of the case consists of the complex non-invasive and in real time imaging examination which describes the "in vivo" histology of the benign tumor lesion.

Keywords: histiocytoma, skin ultrasound, contrast enhanced ultrasound, elastography, histology

Introduction

Dermatofibroma, known as benign fibrous histiocytoma, nodular subepidermal fibrosis, or sclerous hemangioma represents the second most common tumor of the skin. It appears as an elevated papule that occurs more commonly in females (4/1), usually in the limbs. The tumors are usually painless, although pruritus and tenderness may be present. The cause of dermatofibromas is unknown [1,2]. Diagnosis of pigmented skin tumors is often difficult [3]. High frequency ultrasound (HFUS) and Doppler ultrasound can characterize these tumors and may help in establishing positive and differential diagnosis of pigmented skin tumors [4-6]. Elastography is a non-invasive method which evidences the elasticity of soft-tissues. The method is able to increase the specificity of US in the evaluation of nodular lesions of the skin [7-9]. In this case report we will highlight the importance of non-invasive imaging methods in the assessment of cutaneous tumors.

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Case report

A 52 year old female patient presented with a discrete painful, nodular lesion with an irregular surface, highly pigmented, localized on the right thigh. The lesion initially had the appearance of a small, fibrous papule that evolved in 6-7 months, reaching the actual size of 2/3 cm (fig 1a). The patient had no associated pathology, autoimmune diseases or atopic dermatitis and had not suffered any local traumatism.

Dermoscopy showed fine pigmentation at the periphery of the lesion with leucopigmentary macules situated in the center. No atypical pigmentary reticulation (common for melanocitary tumors), or bizarre vascular arborisations (common for basal cell carcinomas) were

identified (fig 1b). High-frequency US (Dermascan C sonograms 20 MHz) revealed a well-delimited, inhomogeneous, hypoechoic structure, penetrating into the hypodermis, with a US depth index of 8.3 mm (fig 1d).

Gray scale US revealed a cutaneous, well delimited hypoechogenic, inhomogeneous structure, with horizontal dimensions of 36/32 mm and a US depth index of 27 mm; liquid areas could be noticed in the interior of the structure, corresponding to cystic areas (fig 2a). Doppler examination revealed the presence of intratumoral signal, with peripherally disposed vessels only (arterial character, linear intratumoral disposition) (fig 2b). The vascularization degree was correlated with the intense vascularization (dilated vessels) identified on the histological sections.

Elastography revealed a mixed aspect, with peripheral rigidity and elasticity in the central area (fig 2c). Contrast enhanced US allowed the assessment of the intratumoral vascularization, time of arterial load, time of partial download in the area of interest, and time of total download of the contrast agent at the tumoral level (fig 2 d,e,f).

The imaging diagnosis indicated a benign, firm, intense vascularized tumoral lesion compatible with a fibrous histiocytoma. Histological examination confirmed the diagnosis of a benign fibrous histiocytoma (histological Breslow 8 mm) (fig 1c).

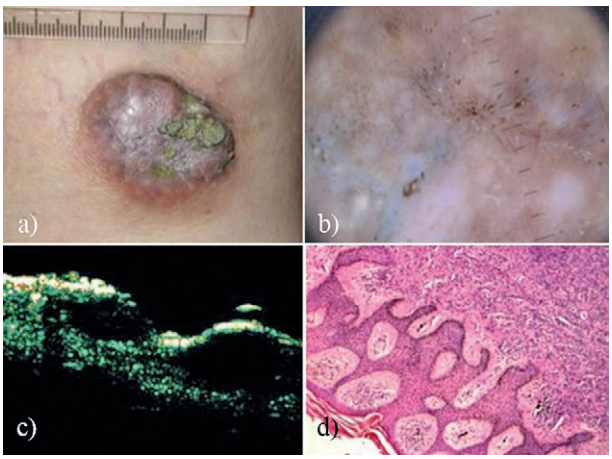

Fig 1. Benign histiocytoma with cystic degeneration: a) Clinical aspect; b) Dermoscopy;c) HFUS; d) Histology (details inside the text).

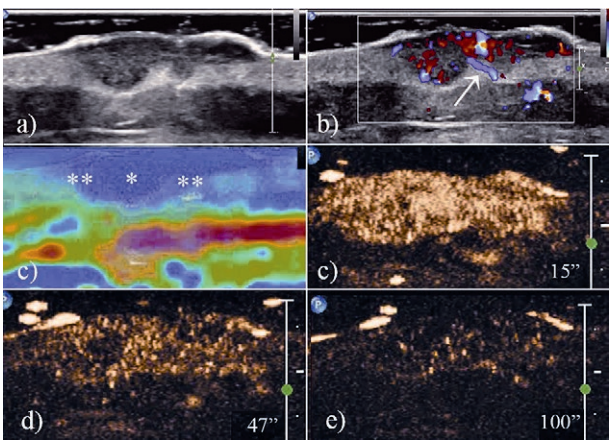

Fig 2. Ultrasonographic aspect; a) gray scale US: discrete exophytic and polycyclic tumoral lesion with imprecise delimitation and inhomogeneous content; b) color Doppler: intense vascular signal of the tumor; vessels have a regular spatial distribution, in an arborescent manner. c) real-time elastography using a color map (blue – rough area, red – low rigidity): the structure is more firm than the surrounding tissues; the tumoral rigidity is increased in the center of the lesion (*) compared to the periphery (**); d) i.v contrast examination: arterial time of the upload; the upload is precocious (15 sec), intense and uniform (complete upload of vascular bed); the delimitation of the vascular bed corresponds to the delimitation of the tumor, as it results from the 2D examination and elastography; e) i.v contrast examination: partial download of the contrast agent from the area of interest (47 sec); the persistence of the vascularized aspect in the tumoral periphery may be noticed; f) i.v contrast examination: complete download of the contrast agent from the area of interest (100 sec); vascular bed is sketched by the presence of few vascular elements

Discussion

Skin tumours represent an increasingly important pathology, whose early identification is nowadays a major public health issue. Ultrasound imaging represents an important non-invasive method that offers promising means to characterize skin lesions. [10]

In our case, the clinical lesion was large, exophytic, with irregular surface, pigmented, with a negative retraction sign. The clinical diagnosis requires the histological confirmation in order to exclude malignant melanoma, pigmented basal cell carcinoma or histiocytoma protuberans. Dermoscopy allows only the exclusion of malignant pigmentary lesions or nodular pigmentary basal cell carcinomas, but not the other forms of malignant tumoral process.

High-frequency and conventional US offer important complementary information regarding the dimensions, structure, elasticity, vascularization degree, dynamics of vascular flow, all important aspects for the prognosis and therapeutic approach. The higher value of the 20 MHz US depth index (8.3 mm), compared to the histological one (8 mm), can be explained by the presence of the peritumoral inflammatory infiltrate. Similar data are

published in literature [11]. Our lesion, as described by HFUS examination, invades the hypodermis (subcutis) and compared to other study data, this happens in 39.3% of the cases [1]. The macrocirculation assessed by Doppler and microcirculation assessed by CEUS exploration (harmonic ultrasound imaging with i.v. contrast) using standardized methods reveal typical aspects for a benign tumour: peripheral circulatory pattern, and a slow "wash out" time of the contrast agent [12-14]. The elastography using a colour coded procedure "touch elastography" showed different aspects related to the histological structure. Previous studies have mentioned that elastography is a sensitive diagnostic tool for detecting of different malignancies, based on the principle that tumoral cells present a higher stiffness compared to the adjacent normal tissue [15-17].

The particularities of the case are related to the histology (the presence of xantomatous cells, the persistence of vessels in an intense fibrous stroma, the presence of dilated vessels in a parallel disposition) on the one hand, and to the ultrasonographic correlations related to the morphometry and vascularization pattern, on the other. The combination of conventional ultrasonography with advanced techniques (CEUS and elastography) has the potential to further improve the differentiation between benign and malignant skin tumours.

Conclusion

US represents a useful imaging method that allows an "in vivo" assessment of the cutaneous tumoral pathology, providing important information, unavailable during clinical or histological examination. It quantifies in real time the vascular flow and elasticity of the lesions. Nevertheless, histology remains the gold standard for diagnosis.

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