Adult Xanthogranuloma Mimicking Basal Cell Carcinoma: Dermoscopy, Reflectance Confocal Microscopy and Pathological Correlation

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Introduction

Juvenile xanthogranuloma is the most common form of non-Langerhans cell histiocytosis. It is predominantly a disease of infancy or early childhood, although adults may infrequently be affected (adult xanthogranuloma) [1, 2], the histological findings of both forms being indistinguishable [1, 3]. The lesions are characterized clinically by unique or multiple yellow-red papulonodules that usually regress spontaneously in children and tend to persist in adult xanthogranuloma [4, 5].

This tumor may be a diagnostic challenge for the dermatologist, with a differential diagnosis that includes benign and malignant neoplasms, such as basal cell carcinoma (BCC), amelanotic melanoma or adnexal neoplasms. Dermoscopy has been described in xanthogranuloma of infancy with an orange-yellowish coloration [6] and in some cases well-defined vessels under dermoscopy [7, 8].

We report a case of a xanthogranuloma in an adult, which clinically and dermoscopically mimicked a BCC due to the presence of characteristic arborizing vessels. A study of the tumor, including in vivo reflectance confocal microscopy (RCM) and histopathology, was performed. To our knowledge, this is the first description of the clinical, dermoscopic and confocal microscopy correlations of a xanthogranuloma.

Key Words
Confocal microscope · Dermoscopy · Xanthogranuloma

Abstract

Juvenile xanthogranuloma in adulthood is an infrequent non-Langerhans cell histiocytosis, which may simulate malignant tumors such as basal cell carcinoma (BCC) or amelanotic melanoma. Dermoscopy has been described as a useful tool in the preoperative diagnosis of xanthogranuloma. We report a xanthogranuloma on the suprapubic area of a 48-year-old female, which clinically and dermoscopically mimicked a BCC with a yellowish hue and arborizing vessels. Reflectance confocal microscopy exhibited large highly refractive atypical cells in the dermis, some of them with pleomorphic nuclei, corresponding to Touton cells in the histopathological study. To our knowledge this is the first description of the clinical, dermoscopic and confocal microscopy correlations of a xanthogranuloma.

Case Report

A 48-year-old female presented with a 3-month history of an asymptomatic suprapubic erythematous nodule (8 × 7 mm) progressively increasing in size. Apart from this cutaneous lesion, there was no relevant disease or familial history. The lesion was examined by dermoscopy (DermLite Foto, 3Gen, Dana Point, Calif., USA) and RCM (Vivascope 1500 plus, Lucid, Rochester, N.Y., USA). Under dermoscopy, according to the 2-step algorithm, the lesion showed no specific criteria of melanocytic tumors [9]. Arborizing telangiectatic vessels were seen on the surface, similar to those found in BCC, but no other specific criteria for non-melanocytic lesions were present (fig. 1) [10]. Under pressure with the plate of the contact dermatoscope, a yellowish-orange hue was evident. Since the dermoscopic appearance due to arborizing vessels was consistent with BCC, we decided to perform RCM guided by dermoscopy using specific software integrated in the confocal system (VivaCam, Lucid, Rochester, N.Y., USA). RCM exhibited a thin epidermis with normal structure of the corneum, granular and spinous layers with a typical honeycomb pattern. The basal epidermal layer and dermal papilla were not distinguished in the tumor. Criteria for melanocytic tumors (cobbledstone pattern, melanocytes in the dermoepidermal junction, clusters of nev
cells) were absent [11]. Numerous fine arborizing vessels (2 μm in diameter) in the upper dermis with a clear correlation with those seen under high magnification dermoscopy were evident. In addition, large highly refractive atypical cells corresponding to xanthomatous cells and Touton cells with a diameter of 25–60 μm, some of them exhibiting multiple pleomorphic nuclei, were present in the upper dermis. Some of the Touton cells presented a few short dendritic structures in vivo. A dense amorphous stromal component with some poorly refractive cells exhibiting mild demarcation was also evident. In the tumor stroma, hyperrefractive particles and small bright cells (2–5 μm) with hyperrefractive nuclei visible in some cases were consistent with inflammatory cells (fig. 2). Criteria for BCC, such as ‘streaming’, polarization of nuclei or the presence of a nest of basaloid cells with clefting, were absent [12, 13]. The lesion was excised and histological study with HE staining revealed a dermal histiocytic infiltrate with vacuolated, foamy xanthomatous cytoplasm and multinucleated giant Touton cells (fig. 3). Marked inflammatory infiltrate of lymphocytes and eosinophils with the presence of small capillaries densely distributed in the tumor were also observed.

**Discussion**

In children, the presence of a unique nodular lesion with a yellowish hue is highly suggestive of xanthogranuloma. In adults, however, this tumor can represent a challenge for clinicians, since this entity is much less frequent and can mimic a wide variety of amelanotic tumors, such as melanoma, BCC, squamous cell carcinoma, adnexal tumors and cutaneous lymphoma.

Dermoscopy is a noninvasive method that can be used to help in the diagnosis of these lesions, since it allows the recognition of structures not visible to the naked eye in pigmented and nonpigmented tumors, such as the vascular pattern [14]. The dermoscopic appearance of xanthogranuloma was reported by Palmer and Bowling [6] with a characteristic orange-yellow background hue and some clouds of paler yellow deposits, consistent with a xanthogranulomatous dermal infiltrate similar to the tumor in our patient. Rubegni et al. [7] recently reported that in their experience the presence of branched and linear vessels is a constant feature in many cases of juvenile xanthogranulomas, and is visible when the examination avoids strong pressure and collapsing the vessels. Cavicchini et al. [8] reported the presence of some isolated dotted vessels in adult xanthogranuloma. We observed vessels that were indistinguishable from ones characteristic of BCC. Xanthogranuloma can also mimic sebaceous hyperplasia under dermoscopy due to the yellowish coloration of this entity with lipid content. In sebaceous hyperplasia, typical crown vessels are seen around the gland structure. A schematic with dermoscopy of xanthogranuloma, BCC and sebaceous hyperplasia describes these findings in figure 4.

To perform a preoperative evaluation, we performed in vivo RCM, a noninvasive technique that has emerged as a promising method for in vivo microscopic evaluation of the skin [11, 15, 16]. This technique allows a dermoscopic correlation for non-melanocytic benign lesions also [17]. RCM showed a normal epidermis with a typical honeycomb pattern but without clear dermal papilla. In the upper dermal component, characteristic refractive large atypical cells of variable diameter (25–60 μm) exhibited prominent nuclei, and in some cases a multinucleated aspect. Those hyperrefractile cells with smaller diameters (25 μm) had a roundish shape, whereas those multinucleated cells with a larger diameter (Touton cells) presented an irregular shape and occasionally short dendritic structures in vivo. These cells corresponded to cells with lipid content in their cytoplasm and had visible nuclei consistent with the typical xanthomatized cells of xanthogranuloma. Small refractive cells (2–5 μm), some of them with small visible nuclei and granularity corresponding to inflammatory infiltrate in the upper dermis, were also visible by RCM. Interestingly, thin capillaries (with a mean caliber of 2 μm) with long arborized shapes were distinct to the typical vessels seen in nodular BCC under RCM, where the diameter tends to be significantly larger. In both entities, vessels tend to proliferate in the upper dermis and are horizontally distributed, making the typical arborizing vessels visible under dermoscopy. No other specific criteria described by dermoscopy or RCM for BCC...

**Fig. 1.** Macroscopic appearance (a) and dermoscopy (b) of the lesion showing an erythematous nodule with a yellowish hue and no specific criteria for a melanocytic lesion. Arborizing telangiectatic vessels are seen on the surface.
**Fig. 2.** Confocal scanning laser microscopy images of the lesion. 

*a* Large highly refractive atypical cells, some of them exhibiting pleomorphic nuclei (asterisks) and some poorly refractive cells exhibiting mild demarcation (arrows) suggestive of inflammatory cells. 

*b* Numerous thin arborizing vessels with a mean caliber of 2 μm in the upper dermis (arrows). 

*c* Some multinucleated giant cells, most probably consistent with Touton cells, were seen in the dermis (arrowhead). 

*d* Granularity aspect with inflammatory cell infiltrate (arrows).
Fig. 3. Microscopic appearance of the lesion, in which cells with foamy xanthomatous cytoplasm (asterisk) and multinucleated giant cells corresponding to Touton cells (arrows) can be observed. HE. \( \times30 \) (a) and \( \times200 \) (b).

Fig. 4. Schematics and dermoscopic images. **a** Xanthogranuloma: the yellowish orange hue is characteristic. **b** BCC with typical arborizing vessels: a pink hue and often other dermoscopic findings, such as ulceration, maple-leaf-like structures or blue ovoid nests, can be associated to telangiectasia. **c** Sebaceous hyperplasia with 'crown vessels': a yellowish coloration can be seen due to lipid content.
were seen in this tumor [10, 13]. Ardigo et al. have also described how the combination of dermoscopy and RCM helps the differentiation of a benign neoplasm (trichoepithelioma) from BCC [18].

In conclusion, xanthogranuloma could mimic the clinical and dermoscopic findings of BCC. The yellowish hue suggesting a xanthomatized tumor was a key in the dermoscopic diagnosis. Reflectance confocal microscopy revealed highly refractive atypical cells in the dermis with pleomorphic nuclei corresponding to the typical xanthomatized tumor cells. Dermoscopy and RCM in combination were a useful tool for the in vivo evaluation in this case of xanthogranuloma, making a strict correlation to histopathology possible.

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References
