

Line-Field Confocal Optical Coherence Tomography of a Suspected Case of Galli-Galli Disease

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Introduction

Galli-Galli disease (GGD) is a rare genodermatosis. Histology shows acantholysis at suprabasal level, hyperkeratosis and a downward finger-like proliferation of the rete ridges into the papillary dermis [1,2]. When histology is only partially conclusive and/or the patient refuses invasive investigations, non-invasive imaging techniques could assist the diagnosis. Coelho de Sousa et al made the first reflectance confocal microscopy (RCM) evaluation of GGD [3]. Line-field confocal optical coherence tomography (LC-OCT) offers additional features compared to RCM, such as a superior penetration in depth (up to 500 µm), a dermoscopic view of the analyzed tissue, and the possibility to obtain vertical histology-like sections and 3D reconstructions of the examined tissue. To date, there are no LC-OCT descriptions of GGD.

Case Presentation

A 64-year-old woman presented to our clinic showing asymptomatic brown papules and lentigo-like macules on the trunk and extremities (Figure 1). Dermoscopy of a papule showed a central yellowish/brownish area with polygonal shape surrounded by a whitish halo overlying a pinkish homogeneous structureless area with harpin and linear vessels (Figure 1). These findings were similar to the acantholytic Darier and Grover diseases[4]. Lentigo-like macules showed a pseudoreticular pattern similar to adenoid seborrheic keratosis. Histological sections from a skin biopsy exhibited hyperkeratosis, dyskeratosis and suprabasal acantholysis (Figure 1). Since the patient refused to undergo a second biopsy, we used non-invasive techniques for further investigations. We examined several papular and pigmented lesions with

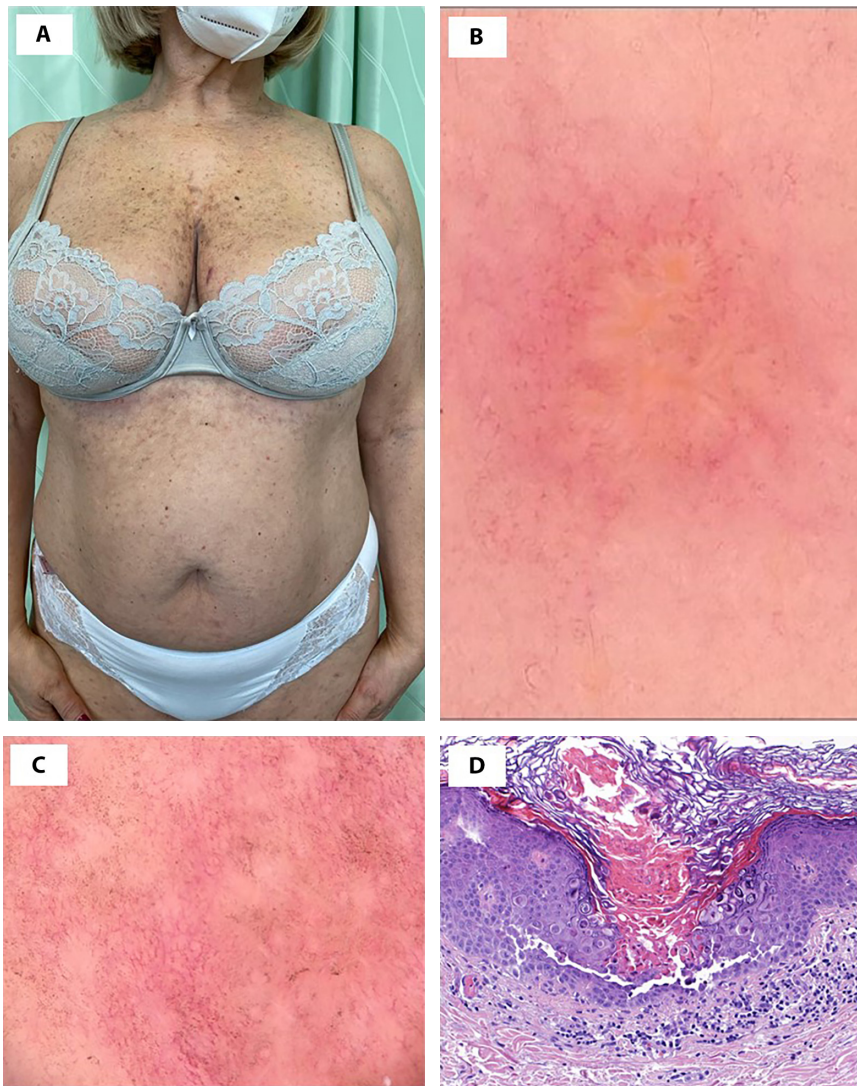


Figure 1. (A) Clinical image of our patient showing brown macules and papules distributed on the trunk and upper extremities. (B) Dermoscopy image of a papule of the upper trunk showing a central yellow area surrounded by white halo and harpin and linear vessels. (C) Dermoscopy image of a lentigo-like macule showing a pseudoreticular pattern. (D) Histological sections from a skin biopsy showing areas of hyperkeratosis and suprabasal acantholysis.

RCM (Vivascope 3000®, Caliber Imaging and Diagnostics): our findings were in accordance with the description of Coelho de Sousa et al (Figure 2) [3]. At LC-OCT evaluation (DeepLive®, DAMAE Medical) several lesions showed intraepidermal dark areas with hyper refractile roundish elements within correlating respectively to acantholysis and dyskeratotic cells, a downward finger-like proliferation of the rete ridges into the papillary dermis and basal hyperpigmentation (Figure 2). These images were reviewed by an interdisciplinary group composed of dermatologists and pathologists; combining these findings with the clinical aspects, GGD was deemed to be the most likely diagnosis. Darier disease has earlier onset, seborrheic distribution of crusted yellow-brown papules rather than lentigo-like macules, nail changes and mucous membrane involvement. Grover's disease usually presents with pruritic keratotic papules on the

trunk, acantholysis and dyskeratosis without elongation of the rete ridges on histology. Dowling-Degos disease was excluded because of the presence of acantholysis and the absence of comedo-like lesions and pitted perioral acneiform scars.

Conclusions

An advantage of LC-OCT in diagnosing GGD is that several lesions can be studied in a relatively short time without causing discomfort to patients; this could be particularly useful given that identifying features such as acantholysis on histology can be difficult and often several histological sections are needed to appreciate them [5]. Indeed, examining different cutaneous lesions can identify the most suitable sites for biopsy thus avoiding the need for multiple biopsies.

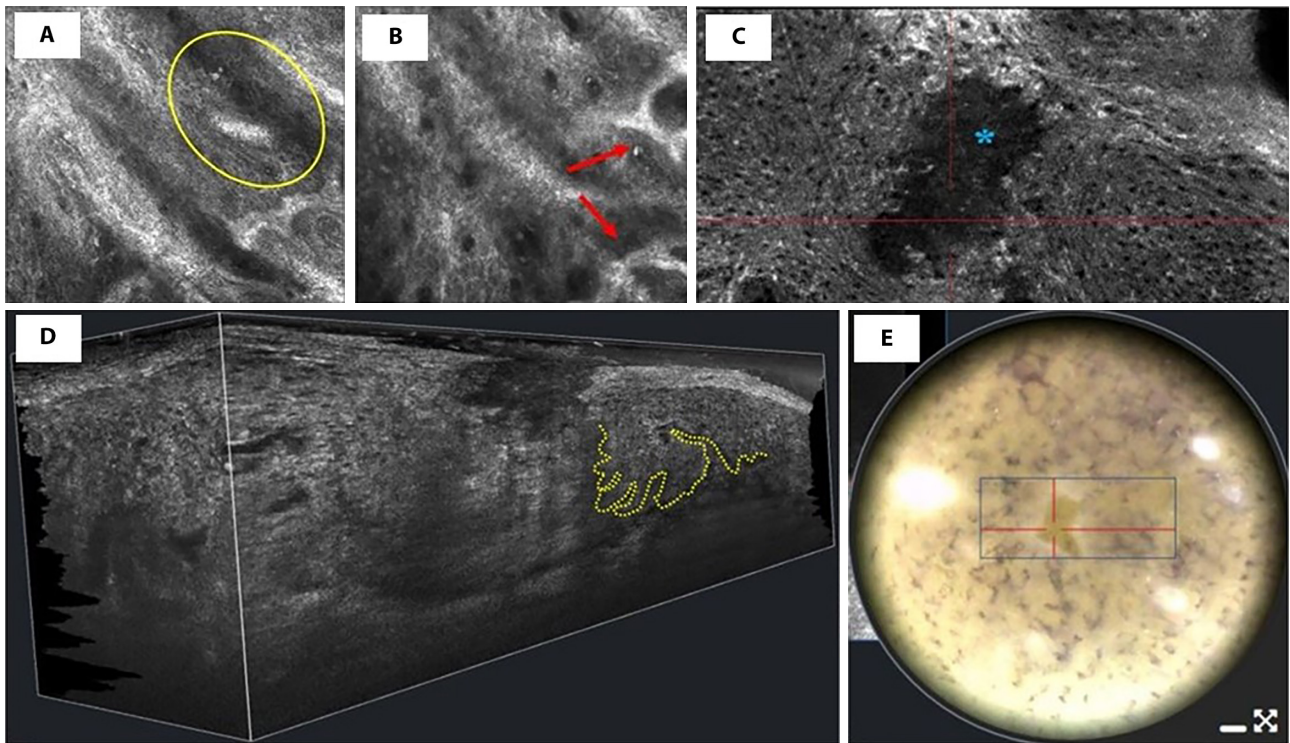


Figure 2. (A,B) Reflectance confocal microscopy RCM images of a hyperkeratotic papule of the trunk showing dark clefts in the epidermis with bright roundish cells within (yellow circle) (A) and branched deer antler-like refractile structure at junctional level (red arrows) (B). (C) Line-field confocal optical coherence tomography (LC-OCT) horizontal section showing an hypo-refractile area of suprabasal acantholysis with dyskeratotic cells within (blue star). (D) LC-OCT 3D reconstruction of the analyzed tissue section showing downward bud-like proliferation of rete ridges into the papillary dermis (yellow line). (E) Dermoscopic view of the pigmented macule analyzed with LC-OCT.

Non-invasive techniques represent a diagnostic tool, yet to be fully discovered, that could allow in a more conservative approach to selected cases.

References

1. Yang A, Cheung K, Kossard S, Murrell DF. Atypical Disseminated Variant of Galli-Galli Disease: A Review of the Literature. *Am J Dermatopathol.* 2020;42(7):484-490. DOI: 10.1097/DAD.0000000000001467. PMID: 31449063.
2. Müller CSL, Pfohler C, Tilgen W. Changing a concept – controversy on the confusing spectrum of the reticulate pigmented disorders of the skin. *J Cutan Pathol.* 2009;36(1):44-48. DOI: 10.1111/j.1600-0560.2008.00995.x. PMID: 18564280.
3. Coelho de Sousa V, El-Shabrawi-Caelen L, Mendes-Bastos P, Oliveira A. Reflectance confocal microscopy for the diagnosis of Galli-Galli disease. *Int J Dermatol.* 2017;56(12):1501-1504. DOI: 10.1111/ijd.13677. PMID: 28703363.
4. Errichetti E, Maione V, Pegolo E, Stinco G. Dermoscopy: a useful auxiliary tool in the diagnosis of type 1 segmental Darier's disease. *Dermatol Pract Concept.* 2016;6(2):53-55. DOI: 10.5826/dpc.0602a10. PMID: 27222773. PMCID: PMC4866628.
5. El Shabrawi-Caelen L, Rütten A, Kerl H. The expanding spectrum of Galli-Galli disease. *J Am Acad Dermatol.* 2007;56(5 Suppl):S86-S91. DOI: 10.1016/j.jaad.2006.10.987. PMID: 17434047.