Title
High-frequency ultrasound features in a case of gouty panniculitis

Journal
Dermatology Online Journal, 23(6)

Authors
Maldonado Cid, P
Rubio Flores, C
Prats Caelles, I
et al.

Publication Date
2017

DOI
10.5070/D3236035386

Volume 23 Number 6 | June 2017
DOJ 23 (6): 9

High-frequency ultrasound features in a case of gouty panniculitis

P Maldonado Cid[1]; C Rubio Flores[1]; I Prats Caelles[1]; VM Leis Dosil[1]; F Alfageme Roldán[2]; P Richi Alberti[3]; C Santonja Garriga[4]; RM Díaz Díaz[1]

Affiliations: [1]Department of Dermatology, Hospital Universitario Infanta Sofía, Madrid, Spain, [2]Department of Dermatology, Hospital Universitario Puerta de Hierro, Madrid, Spain, [3]Department of Rheumatology, Hospital Universitario Infanta Sofía, Madrid, Spain, [4]Department of Pathology, Hospital Universitario Fundación Jiménez Díaz, Madrid, Spain

Corresponding Author: Paola Maldonado Cid, Department of Dermatology, Hospital Universitario Infanta Sofía, Paseo de Europa 34, CP 28702, San Sebastián de los Reyes, Madrid, Spain, E-mail: pmaldonadocid@gmail.com

Abstract

Gouty panniculitis is caused by the deposition of urate crystals in the subcutaneous tissue, accompanied by a lobular panniculitis. It presents as subcutaneous nodules, most commonly located on the lower extremities. Being an unusual clinical presentation of gout, the sonographic findings of gouty panniculitis have been scarcely described in the literature. Our report describes the ultrasound features we found in a case of gouty panniculitis and the usefulness of this technique for diagnosis and monitoring of this disease.

Keywords: gouty panniculitis; gout; ultrasound; tophi

Introduction

Gouty panniculitis is a rare manifestation of gout [1]. It presents as subcutaneous nodules, which may or may not be painful, mainly located on the lower limbs. These nodules are caused by the deposition of monosodium urate crystals in the subcutis associated with a lobular panniculitis [2].

Ultrasound is considered as a useful tool for diagnosis and monitoring of crystal deposition within joints [3, 4]. Compared to other imaging techniques, ultrasound is more sensitive than plain radiography in detecting bone damage and tophi [5]; computed tomography and magnetic resonance imaging allow early detection of bone changes and tophi, but these are expensive and time-consuming imaging modalities [6, 7]. Optical coherence tomography is not adequate for gout assessment as it has a penetration depth of 1.5 mm and in gout lesions are localized deeper [8]. Dermatologists are becoming increasingly interested in the use of high-frequency ultrasound for both inflammatory and tumoral cutaneous disorders. We present a case of gouty panniculitis studied with high-frequency ultrasound and confirmed by histopathological examination. To the best of our knowledge, there is only one previous brief description in the medical literature of sonographic findings in a case of gouty panniculitis [9].

Case Synopsis

A 37-year-old man presented with a nontender mass on the lateral aspect of his right leg. He complained that the lesion had progressively enlarged in the previous 2 years. On physical examination we identified an ill-defined subcutaneous firm nodule of

Figure 1. *Clinical image of gouty panniculitis showing the patient´s lateral side of the leg, with marks surrounding a subcutaneous nodule.*

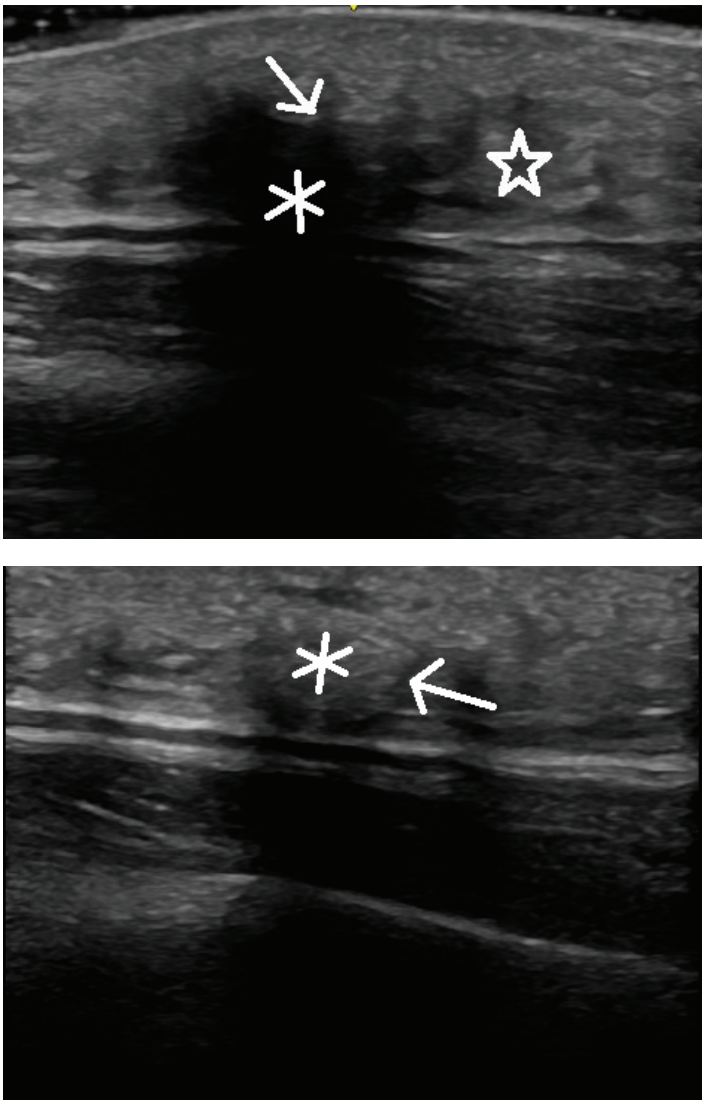

Figure 2. *(Top) Isoechoic and hyperechoic nodular structures in the subcutaneous tissue (arrow) generating a posterior acoustic shadow artifact (asterisk), and mixed hyperechoic and hypoechoic areas in the subcutis (star). (Bottom) Isoechoic subcutaneous nodule (asterisk) surrounded by a hypoechoic rim (arrow).*

about 3 cm on the lateral aspect of the right leg, with neither ulceration nor visible inflammatory signs on the skin (**Figure 1**). Palpation allowed appreciation of similar smaller nodules in the surrounding skin. On the lateral aspect of the contralateral leg we found a similar subcutaneous nodule of approximately 1 cm. The patient had a history of gout diagnosed 10 years before, with frequent attacks of gouty arthritis. He had been taking allopurinol 300 mg daily and colchicine during attacks for years, without medical control. He had tophi on his elbows and on his right foot. The patient denied excessive alcohol intake. He had a history of smoking until two years before presentation, and had a family history of gout.

We performed an ultrasound examination of the subcutaneous nodules using high-frequency linear probes of 10 MHz and 18 MHz (Logiq e BT2 equipment, General Electric Medical Systems, Milwaukee, WI, USA). We found isoechoic and hyperechoic masses in the subcutis generating a posterior acoustic shadow artifact (**Figure 2A**). Some of these nodular structures were surrounded by a hypoechoic rim (**Figure 2B**). In the surrounding subcutaneous tissue there were mixed hyperechoic and hypoechoic areas. These findings were indicative of panniculitis.

Histopathological exam of a biopsy specimen taken from a nodule on the right leg showed deposits of weakly eosinophilic, granular material surrounded by histiocytes, characteristic of gouty tophi (**Figure 3**). These involved exclusively the subcutaneous tissue. A diagnosis of gouty panniculitis was made.

Results of laboratory tests revealed an elevated serum uric acid level of 9.1 mg/dl (normal range 2.5-8 mg/dl), with the rest of laboratory investigations including serum creatinine being within reference range.

Our patient started treatment with febuxostat and colchicine with slow progressive reduction of the size of subcutaneous tophi and a decrease in serum uric acid levels.

Case Discussion

Gouty panniculitis is a rare cause of lobular paniculitis [10]. We have found only a brief description in the medical literature about sonographic findings in gouty panniculitis, described as a heterogenous mass with multiple punctate hyperechoic images [9]. In our case we found iso- and hyperechoic masses in the subcutaneous tissue (tophi) with posterior acoustic shadow, diffuse hyperechoic spots that could correspond to microtophi, and mixed hyperechoic and hypoechoic subcutaneous areas which represent areas of mixed panniculitis.

Intra-articular tophi show similar sonographic features, described as nodular structures with variable echogenicity, with or without posterior acoustic shadow and sometimes with a hypoechoic halo [3]. Posterior acoustic shadow is observed if tophi are hyperechoic or calcified and the hypoechoic

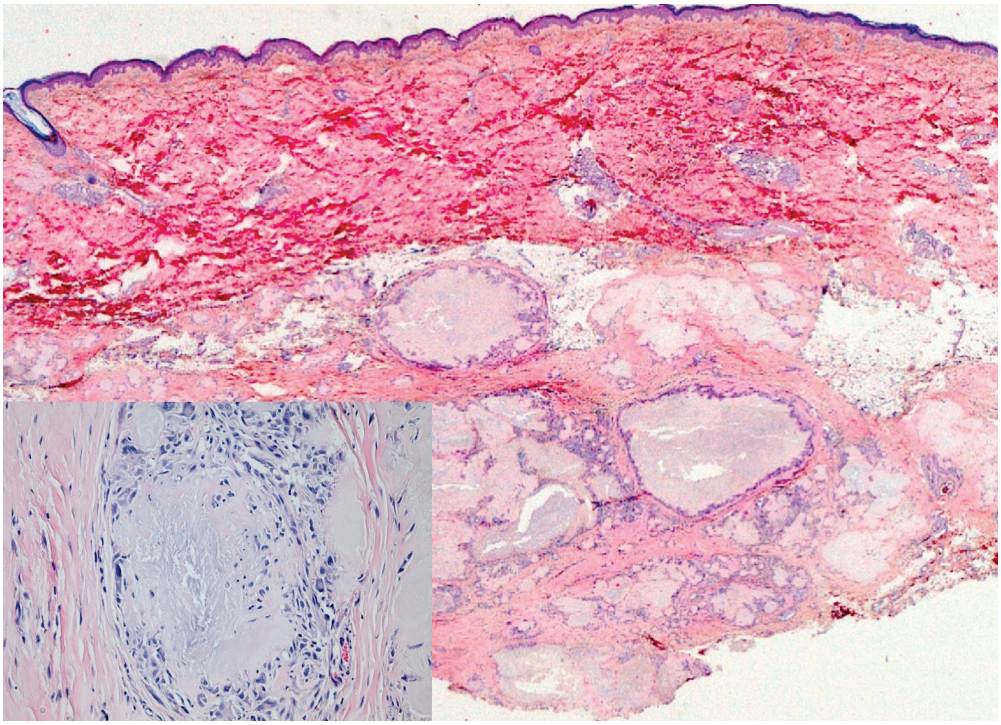

Figure 3. *Low power view of the lesion, showing selective involvement of the subcutis by characteristic deposits of granular, weakly basophilic material surrounded by foreign-body granulomatous reaction (H&E, 2.5x). (Inset), high power view (H&E, 20x).*

halo is related to an inflammatory reaction around the tophus [3]. Microtophi are seen in joints as hyperechoic spots in the joint effusion [5]. Other sonographic signs of gout in joints are bone erosions and the double contour sign [3, 6].

Clinically the differential diagnosis of subcutaneous nodules on the limbs includes other forms of panniculitis such as erythema nodosum, cutaneous calcifications, vascular dilatations such as varicose veins, or tumoral nodules like cutaneous metastases. Regarding ultrasound examination, hyperechoic areas in the subcutis may also be related to calcified deposits such as occurring in lupus erythematosus, secondary hypoparathyroidism, or dermatomyositis [11].

Advantages of ultrasound compared to other imaging techniques are that it is highly sensitive, safe, relatively inexpensive, and adequate for monitoring; it can be repeated as needed [4, 6]. Although the diagnosis of gouty panniculitis is histological, ultrasound examination can be helpful prior to biopsy to better locate urate deposits and increase the yield of wedge biopsy. The technique also allows clinicians to exclude other entities that should not or need not be biopsied (such as varicous veins or lipomas), [12]. It is also suitable for monitoring of treatment response, as tophi can be measured with ultrasound and reduction in their size can be reliably followed during urate-lowering therapy [6].

Conclusion

In conclusion, high frequency ultrasonography of subcutaneous nodules in patients with an elevated serum uric acid level may be of help to diagnose, direct wedge biopsy performance, and monitor this uncommon presentation of the disease.

References

1. Wang L, Rose C, Mellen P, Branam G, Picken MM. Gouty panniculitis with ulcerations in a patient with multiple organ dysfunctions. Case Rep Rheumatol. 2014:320940. [PMID: 25018887]
2. Olazagasti J, Wang AS, Isseroff R. Multiple Firm Nodules and Tender, Indurated Plaques. JAMA Dermatology. 2014;150(5):569–70. [PMID: 24671726]
3. Fodor D, Nestorova R, Vlad V, Micu M. The place of musculoskeletal ultrasonography in gout diagnosis. Med Ultrason. 2014;16(4):336–44. [PMID: 25463888]
4. Grassi W, Okano T, Filippucci E. Use of ultrasound for diagnosis and monitoring of outcomes in crystal arthropathies. Curr Opin Rheumatol. 2015;27(2):147–55. [PMID: 25633243]
5. Ottaviani S, Bardin T, Richette P. Usefulness of ultrasonography for gout. Joint Bone Spine. 2012;79(5):441–5. [PMID: 22386965]
6. Perez-Ruiz F, Dalbeth N, Urresola A, de Miguel E, Schlesinger N. Imaging of gout: findings and utility. Arthritis Res Ther. 2009;11(3):232. [PMID: 19591633]
7. Dalbeth N, Doyle AJ. Imaging of gout: an overview. Best Pract Res Clin Rheumatol. 2012;26(6):823–38. [PMID: 23273794]
8. Welzel J, Lankenau E, Birngruber R, Engelhardt R. Optical coherence tomography of the human skin. J Am Acad Dermatol. 1997;37(6):958–63. [PMID: 9418764]
9. Gaviria JL, Ortega VG, Gaona J, Motta A, Medina Barragán OJ. Unusual Dermatological Manifestations of Gout: Review of Literature and a Case Report. Plast Reconstr surgery Glob open. 2015;3(7):e445. [PMID: 26301134]
10. Requena L, Yus ES. Panniculitis. Part II. Mostly lobular panniculitis. J Am Acad Dermatol. 2001;45(3):325–64. [PMID: 11511831]
11. Lorente Luna M, Alfageme Roldan F, Gonzalez Lois C. Ultrasound Diagnosis of Calcified Skin Deposits. Actas Dermosifiliogr. 2015;106(7):586–8. [PMID: 25890387]
12. Nalbant S, Corominas H, Hsu B, Chen LX, Schumacher HR, Kitumnuaypong T, et al. Ultrasonography for Assessment of Subcutaneous Nodules. J Rheumatol. 2003 Jun;30(6):1191-5. [PMID: 12784388]