UC Davis
Dermatology Online Journal

Title
Minimally invasive management of osteoma cutis miliaris

Permalink
https://escholarship.org/uc/item/3j09q8rh

Journal
Dermatology Online Journal, 31(3)

Authors
Pinzon-Luna, Juliana
Sanchez-Zapata, Maria J
Rodriquez-Lechtig, Bladimir
et al.

Publication Date
2025

DOI
10.5070/D331365369

Copyright Information
Copyright 2025 by the author(s).This work is made available under the terms of a Creative Commons Attribution-NonCommercial-NoDerivatives License, available at https://creativecommons.org/licenses/by-nc-nd/4.0/

Peer reviewed

eScholarship.org Powered by the California Digital Library
University of California

Case Presentation

Minimally invasive management of osteoma cutis miliaris

Juliana Pinzon-Luna, MD[1a], Maria J Sanchez-Zapata, MD[1], Bladimir Rodríguez-Lechtig, MD[1], Ana Sarmiento-Ruiz, MD[1], Mariam Rolón, MD[1], Adriana Motta-Beltrán, MD[1,2]

[1] Department of Dermatology. Universidad El Bosque, Bogotá, Colombia, [2] Research Group, Dermatología Clínica e Infecciosa, Bogotá, Colombia

Keywords: facial dermatoses, osteoma, osteoma cutis

Dermatology Online Journal

Vol. 31, Issue 3, 2025

Abstract

Osteoma cutis miliaris is a rare condition of bone formation in the dermis, often misdiagnosed. We present a 52-year-old woman with asymptomatic, hard papules on the forehead, initially treated as acne. Biopsy confirmed osteoma cutis, and surgical removal via microincisions successfully extracted the lesions with no recurrence. This case emphasizes the importance of accurate diagnosis and highlights a minimally invasive approach as an effective, low-risk treatment option.

Introduction

Osteoma cutis miliaris is a rare condition characterized by bone tissue formation in the dermis and subcutaneous cellular tissue level. This occurs predominantly in middle-aged women and may be associated with a history of severe acne. It presents as calcified papules on the skin and diagnostic confirmation is performed by skin biopsy showing lamellar bone with numerous osteocytes and Haversian canals.[1] Diagnosis is challenging, given the low clinical suspicion and multiple differential diagnoses, which can lead to inadequate management. We present a case of a patient diagnosed with osteoma cutis miliaris, in whom surgical resection was performed with satisfactory results.

Case Synopsis

A 52-year-old woman with a history of mild acne vulgaris in her adolescence was consulted for a two-year history of the progressive appearance of asymptomatic euchromic lesions on the face. The condition was initially treated as comedogenic acne with adapalene and benzoyl peroxide without response. On physical examination she exhibited multiple, hard, nonmobile euchromic papules of 2-3mm on the forehead (Figure 1A-B). Based on these findings, a biopsy was indicated. The histopathological study revealed spicules of mature bone at the level of the upper and middle dermis with presence of dense eosinophilic deposits compatible with osteoma cutis miliaris (Figure 2A-C).



Figure 1. ***A-B)*** *Forehead: multiple euchromic papules of 2-3mm with a hard consistency are evident.*

Based on the results obtained, management with surgical resection was indicated. This was performed through microincisions on the lateral edge of the osteoma with a 20G needle. The needle was then directed toward the skin that over the osteoma, generating a small incision on it. A skin hook was used when needed. Complete extraction was performed and subsequent closure by secondary intention. Two sessions were carried out during which approximately 15 osteomas per session were extracted. Healing was excellent and no recurrence was noted 6 months after treatment.

Case Discussion

Osteoma cutis miliaris is a mature bone neoformation of spongy or lamellar bone, which forms in the dermis or subcutaneous cellular tissue.[1] It could be primary (<15% of the cases) when it arises de novo in healthy skin as in the case of our patient, and secondary, when it is associated with neoplastic lesions, such as melanocytic nevi

a Corresponding Author: Juliana Pinzon-Luna, Carrera 9 No 134-40, Bogotá, Colombia, Tel: (+57) 300-861-3556, Email: jpinzonl@unbosque.edu.co

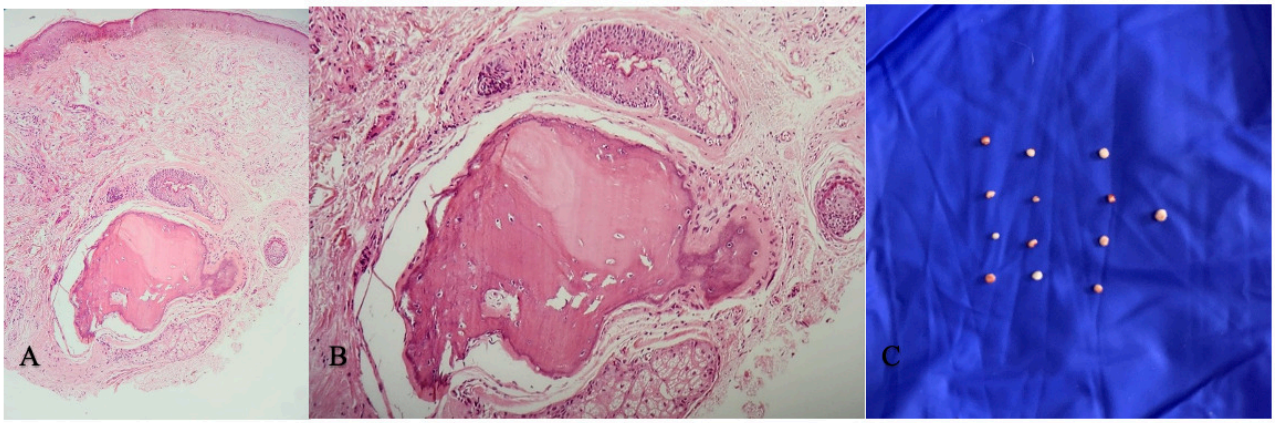


Figure 2. ***A)*** *Rounded formations of mature bone occupying the dermis are evident (hematoxylin and eosin stain, 200X).* ***B)*** *Close-up (hematoxylin and eosin stain, 400X).* ***C)*** *Osteomas shown after removal.*

or hemangiomas. The pathophysiology is not fully elucidated, but two hypotheses have been proposed. One suggests that primitive mesenchymal cells, which differentiate into osteoblasts, migrate to an unusual site. The second suggests that ossification is the result of osteoblastic metaplasia of fibroblasts. These theories indicate an aberrant cellular differentiation process as the basis for the development of bone lesions in the skin.[2]

Clinically, osteoma cutis presents as asymptomatic papules of hard consistency on the face, especially in the malar areas, forehead, and scalp. They can be eucromic, white, or bluish and although they are usually associated with chronic acne vulgaris, they can also appear without a history of acne. Histopathologically, lamellar bone is observed in the dermis with numerous osteocytes and Haversian canals. In the reticular layer, osteocytes surround bone tissue, trapping adipocytes and occasionally showing hematopoietic capacity.[2,3] Conditions in the differential diagnosis include skin manifestations that present with similar clinical features. One of the most common conditions to consider is milia, which are small, keratin-filled cysts that typically appear on the face, particularly around the eyes in middle-aged patients. Others include sebaceous cysts, pilomatrixomas, and inflammatory papules of rosacea or sarcoidosis. Accurate differentiation relies on histopathological examination, with osteoma cutis miliaris showing bone tissue within the dermis; the other conditions lack this feature.[4]

Treatment options are limited and vary depending on the extent and depth of the lesions. Noninvasive modalities, such as topical tretinoin, are ineffective and are used when the lesions are superficial and small. However, in cases of more numerous or deeper osteomas, invasive treatments are the first line of treatment.[5,6] These include techniques such as dermabrasion, scalpel incisions followed by curettage, and the use of lasers such as erbium:YAG and CO2. Also, procedures that combine the use of the CO2 laser followed by curettage have been successful.[3,6] In the reported literature, a modified procedure is described in which a small incision is made followed by the extraction of the lesion with a skin hook. This was performed in our patient, showing an advantage over traditional techniques since it generates less dermal damage and minimizes recovery and healing time.

Conclusion

Osteoma cutis miliaris is a rare condition best treated with minimally invasive techniques. In our case, a modified approach involving a small incision followed by extraction with a skin hook was used, minimizing dermal damage and speeding up recovery, making it an effective option compared to other invasive methods.

Potential conflicts of interest

The authors declare no conflicts of interest.

References

1. Duarte BMF, Pinheiro RR, Cabete J. Multiple miliary osteoma cutis: a comprehensive review and update of the literature. *Eur J Dermatol*. 2019;28(4):434-439. doi:10.1684/ejd.2018.3365. PMID:30325330

2. Kim SY, Park SB, Lee Y, Seo YJ, Lee JH, Im M. Multiple miliary osteoma cutis: treatment with CO2 laser and hook. *J Cosmet Laser Ther*. 2021;13(5):227-230. doi:10.3109/14764172.2011.613481. PMID:21859332

3. Altman JF, Nehal KS, Busam KJ, Halpern AC. Treatment of primary miliary osteoma cutis with incision, curettage, and primary closure. *J Am Acad Dermatol*. 2021;44(1):96-99. doi:10.1067/mjd.2001.108377. PMID:11148484

4. Danset M, Deschamps T, Kanitakis J, Ducroux E, Lesort C. Dermpath & Clinic: Multiple miliary osteoma cutis. *Eur J Dermatol*. 2019;29(6):674-675. doi:10.1684/ejd.2019.3690. PMID:31903971

5. Chabra IS, Obagi S. Evaluation and management of multiple miliary osteoma cutis: Case series of 11 patients and literature review. *Dermatol Surg*. 2014;40(1):66-68. doi:10.1111/dsu.12389. PMID:24320145

6. Baskan FB, Turan H, Tunali S, Toker SC, Adim SB, Bolka N. Miliary osteoma cutis of the face: treatment with the needle microincision–extirpation method. *J Dermatol Treat*. 2007;13:252-254. doi:10.1080/09546630701287878. PMID:17671887