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Case Report

Serious complication associated with mesotherapy: case report of atypical cutaneous mycobacteriosis and literature analysis

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ABSTRACT

Mycobacterium abscessus is an opportunistic pathogen that is part of the fast-growing non-tuberculous mycobacteria. It is found in the environment, such as soil and water, and represents a risk of infection. In the dermatological field, mesotherapy is used to treat various skin conditions and various medications are used. It is also used in aesthetics, but hygiene and safety standards are often not followed, which can cause complications such as infections. Skin lesions may be the first or only sign of infection. Its diagnosis is based on clinical criteria and the response to treatment. Treatment is not well established and it shows resistance to medications. This article reviews the classification, epidemiology, etiopathogenesis, transmission route, diagnostic methods, clinical presentations, histology and current therapeutic options of this group of mycobacteria.

Keywords: *Mycobacterium abscessus*, *Mycobacterium abscessus* massiliense, Atypical mycobacteria, PCR, Mesotherapy, Aesthetic procedures, Skin infections

INTRODUCTION

Nowadays, in the field of dermatology and aesthetics, there is an increasing demand from patients to undergo facial and body procedures to improve their physical appearance. Among these procedures is mesotherapy, which consists of the application of intradermal injections with diluted pharmacological substances directly to the site to be treated. In the dermatological field, mesotherapy has been applied to a multitude of skin conditions and several drugs have been used.[1] However, in addition to its application in dermatology, mesotherapy has also been applied in the field of aesthetics. Unfortunately, these procedures are not always performed under the appropriate standards of hygiene and safety for the patient, so complications such as skin and soft tissue infections may occur. Nontuberculous mycobacteria (NTM)-associated disease is the most common type of infection associated with mesotherapy, particularly *Mycobacterium chelonae* and *Mycobacterium abscessus masiliense*.[2]

Mycobacterium abscessus is characterized by its rapid growth. Previously classified as a subspecies of *M. cheloneae* in 1903, *M. abscessus* was first isolated by Moore and Frerichs in 1953 and was classified as an individual species in 1992.[3-6,10] The *Mycobacterium abscessus* complex includes emerging pathogenic species belonging to the group of rapidly growing nontuberculous mycobacteria (NTM), a name that is related to the time of appearance of visible colonies in less than 7 days in primary solid cultures.[3]

CASE REPORT

A 30-year-old female patient with a history of hypothyroidism came to the dermatology service due to a disseminated condition affecting the trunk on the anterior

side in lower third of abdomen and sides, posterior trunk, the lower third in the buttocks and upper right extremity, consisting of multiple erythematous-violet nodules, some ulcerated and others with a bloody crust and whitish scale on the surface. The patient reports that the condition began 5 months before with the application of "lipolytic mesotherapy" to abdomen and arms with 3 applications at intervals of one week, where she subsequently noticed painful hives. The patient went to a primary care physician where she was prescribed moxifloxacin 400 mg every 24 hours for 14 days, fusidic acid/betamethasone topical application every 12 hours for 2 weeks, serratiopeptidase 10 mg every 12 hours for 14 days, without resolution of the condition. The dermatology service performed a biopsy, PCR, and culture for atypical mycobacteria. The result of the PCR test was positive for *Mycobacterium abscessus masiliense*. The biopsy reported laminated orthokeratosis with focal parakeratosis, epidermis with moderate and irregular acanthosis, a marked granulomatous inflammatory infiltrate composed of neutrophils, eosinophils, lymphocytes and histiocytes was observed, ranging from the papillary dermis to the subcutaneous tissue, where lipophagic and coagulative fat necrosis was observed with empty spaces. Then, she received treatment with clarithromycin 500 mg every 12 hours, doxycycline 100 mg every 12 hours, moxifloxacin 400 mg every 24 hours. At the time of her last evaluation, she received treatment for 3 months, where patient reported 90% improvement. The physical examination revealed the same topography, in this case consisting of multiple erythematous spots and some hyperpigmented dark brown spots, with defined irregular boundaries and erythematous eutrophic scars. In the next follow-up visit, dermatosis showed localized lesions affecting the trunk on anterior side in lower 3rd of abdomen and posterior side in upper buttocks' region, consisting of brown hyperpigmented spots with irregular and well-defined boundaries. Patient responded well to treatment as she showed good adherence and currently shows significant clinical improvement, with only post-inflammatory spots remaining.

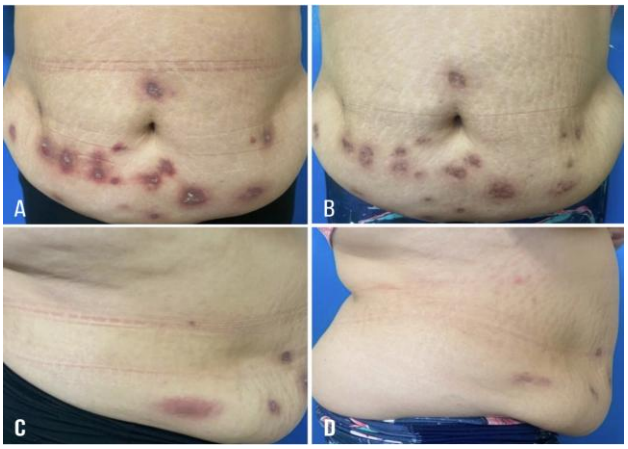

Figure 1 (A-D): Patient with complication associated with aesthetic procedure: mesotherapy. A and C before treatment. B and D 3 months after treatment.

DISCUSSION

Infections by atypical mycobacteria have increased during the last decade; in the skin the incidence is 2 per 100,000 inhabitants, with a higher frequency in women (58%) and an average age of 47 years.[11-13] The published cases are from countries where mesotherapy is popular, mainly France, Spain and Latin America.[24,25] In Latin America, mesotherapy is used in some skin conditions and in aesthetic treatments such as: reduction of keloid scars, alopecia, body lipolysis and anti-cellulite therapy. The substances injected for this purpose are vasodilators, lipolytics (L-carnitine, aminophylline), minerals, vitamins and natural plant extracts (artichoke, centella asiatica), which can be mixed with local anesthetics (lidocaine or procaine).[4]

The species of the *M. abscessus* complex are intracellular bacteria that require interaction with antigen-presenting cells. This process requires multiple receptors that facilitate the opsonization mechanism, such as: complement receptors type 3 (CR3), immunoglobulins (IgG), mannose-binding proteins (MBP), glycosylated components and surfactant factor A (SPA).[14] Once inside the host cell, mycobacteria limit acidification in the phagosome through the following mechanisms: a) incorporation of protons for the reduction of ATPases, b) decreased acquisition of endosomal/lysosomal rab7 markers and c) presence of lysosomal membrane proteins (LAMP). In this way, the bacteria create a suitable microenvironment for its own survival within the phagosome.[14-17]

Diagnosis is often delayed because the histopathological study is not conclusive. Histopathological patterns such as a) granulomatous inflammation in the deep dermis and subcutaneous cellular tissue, b) abscesses with mild granulomatous reaction, c) granulomatous inflammation in the deep dermis and subcutaneous cellular tissue with neutrophilic infiltrate are observed in the skin biopsy.[30] Accurate diagnosis is supported by biopsy cultures and polymerase chain reaction (PCR) for identification of the organism with antimicrobial susceptibility testing (antibiogram).[13,30,31]

Treatment is often difficult because nontuberculous mycobacteria are generally resistant to standard antibiotics and have variable sensitivity depending on the species. Therefore, it is very important to have species identification and antibiogram to adjust antimicrobials. *M. abscessus* is usually sensitive to clarithromycin, amikacin and cefoxitin and the combination of two or more antibiotic agents is suggested since monotherapy contributes to the development of resistance.[32,33] The recommended treatment time may be prolonged: localized disease usually responds within 2-4 months under therapy in immunocompetent patients, while disseminated infections may require more than 6 months.[34-36] The recommended follow-up time is between 6 and 12 months after discontinuation of treatment.

The susceptibility list should include at least amikacin, cefoxitin, imipenem, clarithromycin, linezolid, doxycycline, tigecycline, ciprofloxacin, and moxifloxacin. Per the official ATS/ERS/ESCMID/IDSA clinical practice guidelines, for *M. abscessus* infections, whether the strains possess inducible or mutational macrolide resistance or not, it is recommended to initiate with a macrolide-inclusive multidrug regimen, which should encompass at least three medicaments proven effective *in vitro*. An observational study (Da et al) showed that all strains of the *M. abscessus* group were susceptible to amikacin, linezolid, clofazimine, and tigecycline and suggested a prolonged drug resistance testing of 14 days to determine the presence of inducible resistance to macrolides is necessary.[9] Treatment also includes incision and drainage, debridement, and foreign body removal.[38]

CONCLUSION

Given the growing demand of the population regarding the performance of aesthetic procedures, it is of great importance to highlight the complications derived from the application of these procedures without adequate hygiene measures, as well as the practice of said procedures by non-medical personnel. The above determines the relevance of timely suspicion based on a good interrogation, the characteristics of its clinical presentation and knowing the methods of timely diagnosis. The determination of the species of the mycobacteria involved guides us towards an effective and specific treatment, which will result in a faster limitation and resolution of the evolution of the condition, thus avoiding major complications.

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REFERENCES

1. Canzona F, Mammucari M, Tuzi A, Maggiori E, Grosso MG, Antonaci L, et al. Intradermal Therapy (mesotherapy) in Dermatology. J Dermatol Skin Sci. 2020;2(1):22-5.
2. Schcolnik-Cabrera A, Vega-Memije E, Hernández-Castro R, Arenas R, Fernández-Martínez R. El costo de la belleza: Comunicación de seis casos clínicos con infección por micobacterias atípicas secundario a inyecciones intradérmicas y reacción a un dermoimplante de origen desconocido. Rev Chilena Infectol. 2019;36(6):778-83.
3. García-Martos P, García-Agudo L. Infecciones por micobacterias de crecimiento rápido. Enferm Infecc Microbiol Clin. 2012;30;192-200.
4. Mougari F, Guglielmetti L, Raskine L, Sermet-Gaudelus I, Veziris N, Cambau E. Infections caused by Mycobacterium abscessus: epidemiology, diagnostic tools and treatment. Expert Rev Anti Infect Ther. 2016;(12):1139-54.
5. Wentworth AB, Drage LA, Wengenack NL, Wilson JW, Lohse CM. Increased incidence of cutaneous nontuberculous mycobacterial infection, 1980 to 2009: A population-based study. Mayo Clin Proc. 2013;88(1):38-45.
6. Contla-Martínez II, Vega-Memije ME, Arenas-Guzmán R, Boeta-Ángeles L. Micobacteriosis no tuberculosa por *Mycobacterium abscessus* secundaria a rasguño de gato. Dermatología Rev Mex. 2020;64(4):411-7.
7. Ramírez A, Araque M. Patógenos emergentes multirresistentes: complejo Mycobacterium abscessus Ana Ramírez, María Araque. Avances Biomed. 2017;6(3):203-15.
8. Rodríguez-Cerdeira C, Hernández-Castro R, Sánchez-Cárdenas CD, Arenas R, Meza-Robles A, Toussaint-Caire S, et al. Atypical Mycobacteriosis Due to *Mycobacterium abscessus* subsp. massiliense: Our Experince. Pathogens. 2022;11(12):1399.
9. Wang X-Y, Jia Q-N, Li J. Treatment of non-tuberculosis mycobacteria skin infections. Front Pharmacol. 2023;14:1242156.
10. Estrada-Moreno BE, Sánchez-Tadeo MT, Barrios-Pérez KV, González-Angulo MN. Infección cutánea por micobacterias atípicas del complejo *M. abscessus*. Dematol Rev Mex. 2022;66(1):100-7.
11. Chung J, Ince D, Ford BA, Wanat KA. Cutaneous infections due to nontuberculosis *Mycobacterium*: Recognition and management. Am J Clin Dermatol. 2018;19(6):867-78.
12. Wentworth AB, Drage LA, Wengenack NL, Wilson JW, Lohse CM. Increased incidence of cutaneous nontuberculous mycobacterial infection, 1980 to 2009: A population-based study. Mayo Clin Proc. 2013;88(1):38-45.
13. Jin J, Jia J, Ding XI, Chen X. Sporadic cutaneous infections due to nontuberculous mycobacteria: a retrospective study of 37 cases. Beijing Da Xue Xue Bao Yi Xue Ban. 2015;47(6):939-44.
14. Houben EN, Nguyen L, Pieters J. Interaction of pathogenic mycobacteria with the host immune systems. Curr Opin Microbiol. 2006;9:76-85.
15. Garza R, Monroy F y Perea L. Micobacterias no tuberculosas: actual importancia clínica y principales factores de virulencia. 2010. Available at: http://depa.pquim.unam.mx/bacteriologia/pdfs/micobacterias.pdf. Accessed on 12 April 2025.
16. Cosma CL, Sherman DR, Ramakrishnan M e secret lives of the pathogenic mycobacteria. Annu Rev Microbiol 2003;57:641-76.
17. Majlessi L, Combaluzier B, Albrecht I, Garcia JE, Nouze C, Pieters J, et al. Inhibition of phagosome maturation by mycobacteria does not interfere with presentation of mycobacterial antigens by MHC molecules. J Immunol 2007;179:1825-33.
18. Mougari F, Guglielmetti L, Raskine L, Sermet-Gaudelus I, Veziris N, Cambau E. Infections caused by *Mycobacterium abscessus*: epidemiology, diagnostic tools and treatment. Expert Rev Anti Infect er. 2016;14:1139-54.

19. Valdés F, Cid A. Micobacterias atípicas. Actas Dermosifiliogr. 2004;95:331-57.
20. García-Martos P, García-Agudo L. Infecciones por micobacterias de crecimiento rápido. Enferm Infecc Microbiol Clin. 2012;30;192-200.
21. Da Mata O, Hernández-Pérez R,Corrales H, Cardoso-Leao S, de Waard JH. Seguimiento de un brote de infección en tejido blando causado por *Mycobacterium abscessus* posterior a la mesoterapia en Venezuela. Enferm Infecc Microbiol Clin. 2010;28:596-601.
22. Wu TS, Yang CH, Brown-Elliott BA, Chao AS, Leu HS, Wu TL, et al. Postcesarean section wound infection caused by *Mycobacterium massiliense*. J Microbiol Immunol Infect. 2016;49:955-61.
23. Gnatta JR, Sato-Kurebayashi L, Paes-da Silva M. Micobacterias atípicas asociadas a la acupuntura: revisiónintegral. Rev Latino-Am Enfermagem. 2013;21:1-10.
24. Picinin Safe I, Macedo V, Marcelo W, Baia-Da-Silva D, Monique F, Renata S, et al. Nontuberculous mycobacterial infections after aesthetic procedures: comparison of clinical features and treatment. J Clin Aesthet Dermatol. 2021;14(3):46-9.
25. García-Harana C, Aguilar-Bernier M, Segura-Palacios JM, de Troya-Martín M. Paniculitis por micobacterias atípicas tras mesoterapia. Actas Dermosifiliogr. 2018;109:747.
26. Ramos A, Roustan G, Lucena JL, Daza RM. Aparición de nódulos subcutáneos después de aplicación de mesoterapia. Enferm Infecc Microbiol Clin. 2011;29:775-7.
27. Correa NE, Catano JC, Mejía GI, Teresa R, Beatriz O, Santiago E, et al. Outbreak of mesotherapy-associated cutaneous infections caused by *Mycobacterium chelonae* in Colombia. Jpn J Infect Dis. 2010;63(2):143-5.
28. Rivera-Olivero IA, Guevara A, Escalona A, Oliver M, Pérez-Alfonzo R, Piquero J, et al. Infecciones en tejidos blandos por micobacterias no tuberculosas secundarias a mesoterapia. ¿Cuánto vale la belleza? Enferm Infecc Microbiol Clin. 2006;24:302-6.
29. Zhang X, Liu W, Liu W, Jiang H, Zong W, Zhang G, et al. Cutaneous infections caused by rapidly growing mycobacteria: Case reports and review of clinical and laboratory aspects. Acta Derm Venereol. 2015;95:985-9.
30. Mougari F, Guglielmetti L, Raskine L, Sermet-Gaudelus I, Veziris N, Cambau E. Infections caused by *Mycobacterium abscessus*: epidemiology, diagnostic tools and treatment. Expert Rev Anti Infect Ther. 2016;14(12):1139-54.
31. Franco-Paredes C, Marcos LA, Henao-Martínez AF, Rodríguez-Morales AJ, Villamil-Gómez WE, Gotuzzo E, et al. Cutaneous mycobacterial infections. Clin Microbiol Rev. 2019;32(1):1-25.
32. Lee MR, Sheng WH, Hung CC, Chong-Jen Y, Li-Na L, Po-Ren H. *Mycobacterium abscessus* complex infections in humans. Emerg Infect Dis. 2015;21(9):1638-46.
33. Rébora I, Busso C, Jacob N. Infección cutánea por *Mycobacterium chelonae* asociada a lipoaspiración. Der matol Argent. 2007;13:195-8.
34. Schnabel D, Esposito DH, Gaines J, Alison Rh, Barry MA, Feldman KA, et al. Multisite US outbreak of rapidly growing mycobacterial infections as sociated with medical tourism to the Dominican Republic, 2013-2014. Emerg Infect Dis. 2016;22(8):1340-7.
35. Da Mata Jardín O, Hernández-Pérez R, Corrales H, Cardoso-Leao S, De Waard JH. Seguimiento de un brote de infección en tejido blando causado por *Mycobacterium abscessus* posterior a la mesoterapia en Venezuela. Enferm Infecc Microbiol Clin. 2010;28(9):596-601.
36. Galmés-Truyols A, Giménez-Duran J, Bosch-Isabel C. An outbreak of cutaneous infection due to *Mycobacterium abscessus* associated to mesotherapy. Enferm Infecc Microbiol Clin. 2011;29:510-4.
37. Veraldi S, Spigariolo CB, Cusini M. Skin infections by *Mycobacterium chelonae* following mesotherapy: A report of two cases and review of the literature. J Cosmet Dermatol. 2020;19:1915-7.
38. Bae JY, Yun IS, Roh TS, Kim YS. Treatment strategy for skin and soft tissue infections caused by nontuberculous mycobacteria following various procedures. Arch Aesthet Plast Surg. 2021;27(1):3-11.

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