

# *Mycobacterium mageritense* subcutaneous infection following cryopreserved facial fat injection: A report of 2 cases



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**Key words:** adverse effect; autologous; autologous fat transfer; fat injections; infection; minimally-invasive plastic surgery; mycobacterial infection; *Mycobacterium mageritense*; noninvasive plastic surgery; nontuberculous mycobacterium; side effect.

## INTRODUCTION

Autologous fat injection is a cosmetic procedure performed to enhance the cosmetic appearance.<sup>1-3</sup> Infections with nontuberculous mycobacteria (NTM), such as *Mycobacterium fortuitum*, following cryopreserved fat injection have been reported.<sup>1</sup> *Mycobacterium mageritense* is a rapidly growing NTM, and to date, there have been only a few reported cases of skin and soft tissue infection with *M mageritense*.<sup>4,5</sup> Herein, we describe 2 siblings who had subcutaneous infection with *M mageritense* following cryopreserved fat injection performed at a single clinic. To the best of our knowledge, these 2 patients are the first reported subcutaneous infections on the face caused by *M mageritense*.

## CASE REPORT

Two siblings, a healthy 25-year-old woman (patient 1) and a healthy 27-year-old woman (patient 2) presented to our clinic in March 2020 with a 1-month history of pain, swelling, and erythema on their faces. They both had a history of injection with autologous fresh fat 3 months previously, followed by a session of autologous cryopreserved fat injection 2 months later on their faces. Both fresh and cryopreserved fat were injected in the same clinic. Their symptoms included facial erythema, swelling, pain, and fever, which started 2 weeks after the cryopreserved fat injection. Patient 1 had been admitted to another hospital for 10 days, where she

### Abbreviation used:

NTM: nontuberculous mycobacteria

was treated with vancomycin, imipenem, and metronidazole. Regarding patient 2, she had undergone unsuccessful treatment with ciprofloxacin, cefazolin, cloxacillin, cephalexin, and doxycycline. They were then referred to our hospital due to lack of response to treatment. Physical examination of patient 1 showed erythema and edema of her cheeks, buccal regions, and chin. Ulcers with purulent discharge were seen on her chin and left side of the buccal area (Fig 1). An area of induration was palpated on her right side of the buccal region, and there was a fistula with pus in her mouth at the site of the right buccal mucosa. She was afebrile. Regarding patient 2, multiple edematous nodules on her face and lip were observed. There was an erythematous area with pus discharge lateral to the right nasolabial fold, and she was afebrile (Fig 2). Laboratory data for patient 1 did not reveal any abnormal findings, except for a C-reactive protein of 20.0 mg/L (normal range, <3.0 mg/L) and an erythrocyte sedimentation rate of 55 mm/hr (normal range, 0-29 mm/h). Laboratory data for patient 2 did not show any abnormal findings, except for a C-reactive protein of 10.0 mg/L. Ultrasound imaging for patient 1 showed numerous collections of debris that were

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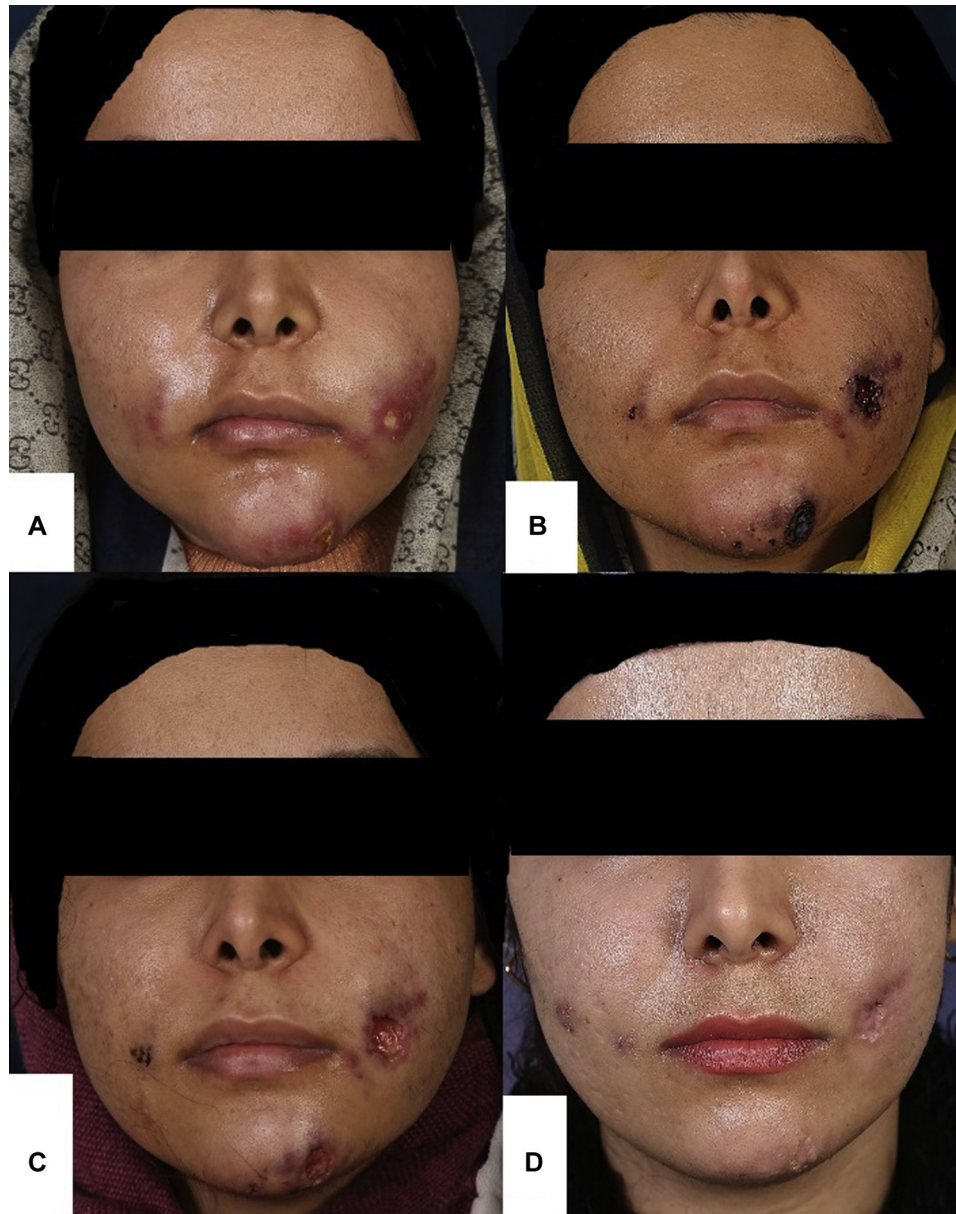
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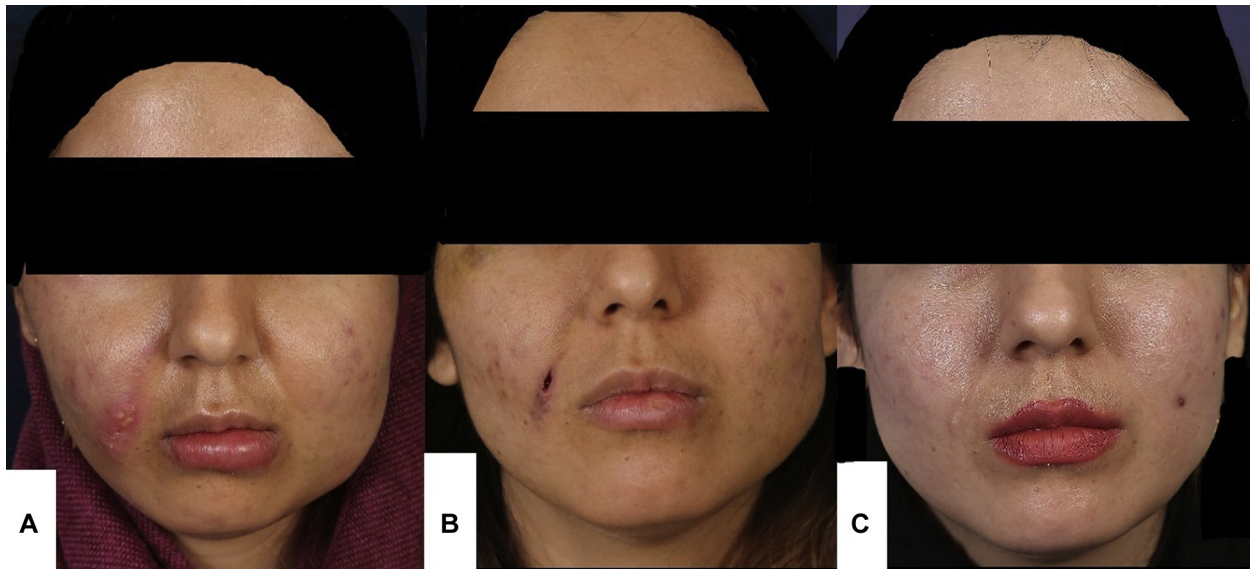
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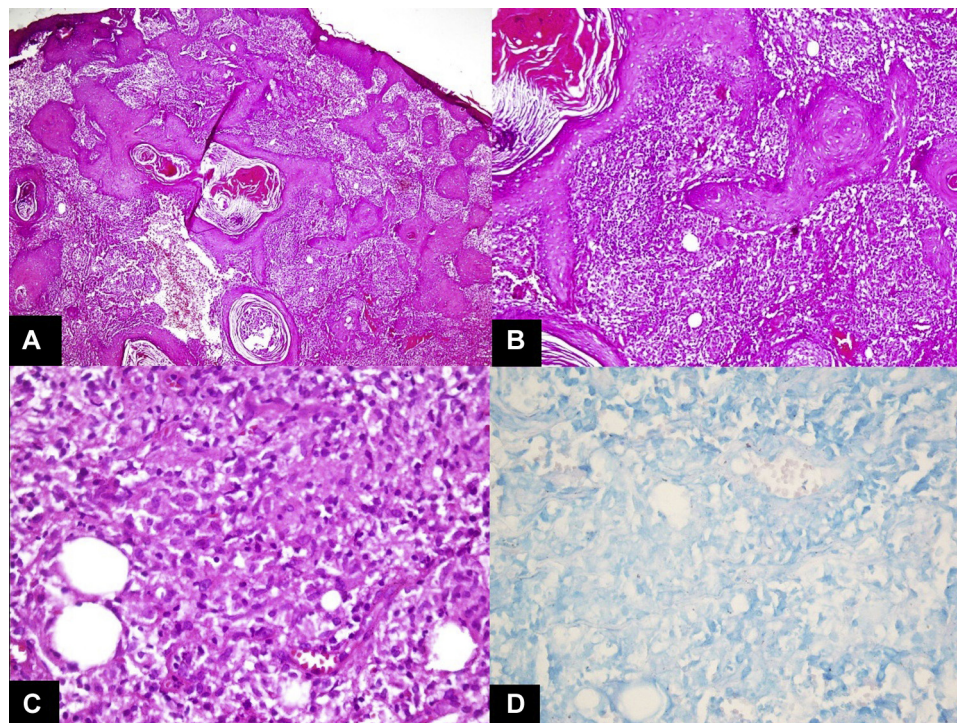
**Fig 1.** Patient 1. **A**, First day of admission in our medical center before the start of any treatment. **B**, Eleven days after admission. **C**, Eighteen days after admission. **D**, Our patient showing significant improvement 5 months after therapy.

located bilaterally to the lip area, on her chin, on the right and left zygomatic arches, and inferiorly to the right zygomatic area. Increased fat echogenicity with hypoecho septa was consistent with cellulitis. Ultrasonographic imaging for patient 2 showed various collections of debris that were located under the left eyebrow, under the left cheek, on the left side of the inferior lip, under the left mandible, medially to the right eyebrow, and on the right zygomatic arch and right nasolabial fold. Various hypoecho findings were compatible with granuloma. Moreover, increased fat echogenicity and areas without an

echo in addition to the fat heterogeneity were suggestive of panniculitis and fat necrosis. For both cases, abscess drainage was performed and Gram stain was negative. Treatment with clindamycin, cefepime, acyclovir, levofloxacin, clarithromycin, and doxycycline for both cases was not successful. At the time of our evaluation, we suspected that the fat of the 2 sisters was mistakenly injected into the other and they therefore had not received autologous fat. Hence, both patients were treated with prednisolone 40 mg daily for 10 days until additional microbiology and histopathology results were



**Fig 2.** Patient 2. **A**, First day of admission in our medical center before the start of any treatment. **B**, Eleven days after admission. **C**, Our patient showing improvement after the treatment. The photo is taken 5 months after discharge in the follow-up.



**Fig 3.** **A**, Low-power view of biopsy showing pseudoepitheliomatous hyperplasia with downgrowth of rete ridges and hyperplastic follicular structures surrounded by mixed inflammation (Hematoxylin-eosin stain; original magnification:  $\times 40$ ). **B**, Medium-power view of mixed inflammatory cells around the hyperplastic squamous nests (Hematoxylin-eosin stain, original magnification:  $\times 100$ ). **C**, High-power view showing ill-defined granuloma composed of predominantly histiocytes and scattered lymphocytes (Hematoxylin-eosin stain, original magnification:  $\times 200$ ). **D**, Ziehl-Neelsen stain with negative result for acid fast bacilli (ZN, original magnification:  $\times 400$ ).

available. After 10 days of prednisolone, no improvement was noted. For both cases, smear of purulent discharge using Ziehl-Neelsen staining revealed acid-fast bacilli. A polymerase chain reaction test for NTM was positive, and DNA sequencing revealed *M mageritense*. In both cases, pathologic evaluations revealed pseudoepitheliomatous hyperplasia with granulomatous inflammation, compatible with an infectious process or foreign-body reaction (Fig 3). Ziehl-Neelsen staining of the histologic samples were negative for acid-fast bacilli. Both of our patients showed a great response after 2 months of therapy with minocycline, and we observed a significant improvement at 5-month follow-up.

## DISCUSSION

*M mageritense* is a nonpigmented, rapidly growing NTM found in environments such as soil, natural products, and municipal water supplies.<sup>4-7</sup> With the increasing requests for minimally-invasive procedures, including autologous fat injection, the adverse effects of such procedures—especially infection—have also increased in total number.<sup>8</sup> *M fortuitum* infection has been reported following cryopreserved fat graft of the face.<sup>1</sup> In a study done by Kim et al<sup>9</sup> on 150 cryopreserved fat samples, 5 sample cultures were positive for *Staphylococcus epidermidis* and 3 samples were positive for *Micrococcus* species.

Previous reports have shown susceptibility of *M mageritense* to a combination of antibiotics. Our patients, however, harbored *M mageritense* isolates demonstrating resistance to a variety of antibiotics. Meanwhile, the significant response to therapy with minocycline is consistent with some previous cases of *M mageritense* infection.<sup>4,5</sup>

Unfortunately, there is no information available about the injection techniques, since fresh fat and cryopreserved fat injections were performed in another center. After initial injection of fresh fat, each patient was given her own fat to keep and store refrigerated at home. The differential diagnoses included foreign-body granuloma, nonautologous fat injection, and fat necrosis.

We assume that the cryopreserved fat had been contaminated with mycobacteria. Notably, our 2 patients underwent fat injection in a small clinic, and we believe that the settings were not sterile. Due to previously reported cases of infection upon injection of cryopreserved fat, we recommend the use of this method only in highly aseptic settings. To the best of our knowledge, this is the first case of *M mageritense* infection developing after injection with cryopreserved autologous facial fat successfully treated with minocycline.

## Conflicts of interest

None disclosed.

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