

***Mycobacterium Conceptionense* Mastitis after Autologous Fat Transfer for Breast Augmentation: A Case Report**

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Abstract

Mastitis caused by nontuberculous mycobacteria (NTM) is an unusual disease. It typically results from trauma or surgery, and rapid-growing NTM (RGM) is usually the causative pathogen. *Mycobacterium conceptionense* previously has been reported to cause soft tissue disease, but not mastitis. Herein, we report the case of a patient who contracted *M. conceptionense* mastitis after breast surgery and was successfully treated with nine months of a combination antibiotic regimen and no further surgical intervention. (J Intern Med Taiwan 2019; 30: 408-413)

Key Words: *Mycobacterium conceptionense*, Mastitis, Cosmetic surgery, Combination antibiotics

Introduction

NTM can cause a wide spectrum of diseases, including pulmonary, soft tissue, bone, and disseminated diseases. In NTM soft tissue diseases, mastitis is rare but has been reported after surgery^{1,2}. *Mycobacterium conceptionense* belongs to the *Mycobacterium fortuitum* group but has a different antibiogram². Although *M. conceptionense* has been shown to cause soft tissue diseases, no mas-

titis has been reported. Herein, we present a case of *M. conceptionense* mastitis that was successfully treated with nine months of antibiotics, without further surgical intervention.

Case Report

A 32-year-old woman received liposuction and fat transfer for breast augmentation at a plastic surgery clinic two years ago. One month after surgery, bilateral breast lumps with redness were

found. Skin rupture with discharge followed. The patient went to the outpatient plastic surgery department (OPD) of a medical center and was given antibiotics. The wound was still unhealed half a year later. The woman had a debridement operation, but the lumps quickly recurred.

One year later, the patient came to our hospital for a second opinion. A breast surgeon performed fine needle aspiration for a pathology evaluation and culture. Pathology findings revealed prominent neutrophils and macrophages, and mastitis was diagnosed. The patient was transferred to the Infectious Diseases (ID) department. At ID OPD, the bilateral masses and nodules were palpated, and a sinus tract and erythema were noted below the right breast (Figure 1A). The largest mass reached 5 cm in diameter at the left breast. Discharge was collected for a mycobacterial culture, acid-fast staining, and polymerase chain reaction (PCR). The mycobacterial culture was positive, and the *Mycobacterium tuberculosis* PCR was negative. NTM identification with the commercial kit at our hospital laboratory could not pinpoint the species.

The pathogen sample was sent to the NTM laboratory at Veteran's General Hospital Taichung for further molecular identification. Species identification with PCR-restriction fragment length polymor-

phism analysis (PRA) was done³. BstEII and HaeIII restriction enzymes for the *hsp65* gene produced fragments 235/120/85 and 140/125/60/55, respectively (Figure 2A). Meanwhile, 16S rRNA gene sequencing was done and compared with sequences in the GenBank database (National Institutes of Health, USA). The pathogen was cultivated at 37°C and 5% CO₂, revealing nonpigmented colony growth after 3 days (Figure 2B). *M. conceptionense* was confirmed. Drug susceptibility testing (DST) was done with broth microdilution under the guidance of the Clinical and Laboratory Standards Institute (CLSI), whose recommendations were revised in 2011 for rapid-growing NTM. The pathogen was susceptible to moxifloxacin, amikacin, doxycycline, clarithromycin, and linezolid (Table 1). Moxifloxacin, clarithromycin, and doxycycline were prescribed to the patient during the first visit at our ID outpatient department.

One week after treatment, the mass lesion at the left breast was smaller. By 1 month after treatment, the sinus tract had healed, and no more erythema was found (Figure 1B). Two months after treatment, a local erythematous nodule was found at the left breast (Figure 3A). A paradoxical reaction was suspected. Prednisolone 20 mg/day, divided into two doses, was given. The erythema darkened,

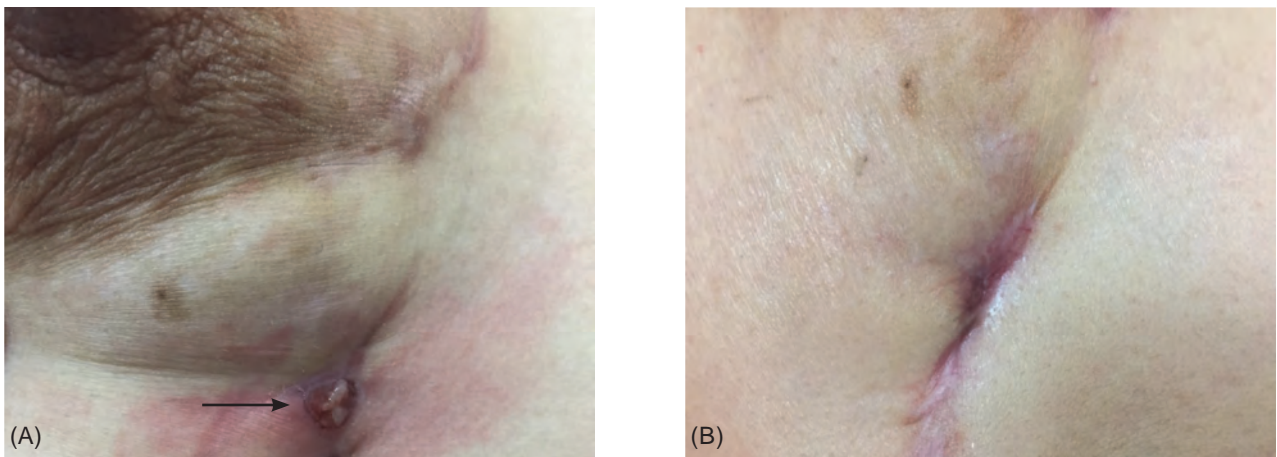


Figure 1. Sinus tract: The arrow indicates a sinus tract with local skin erythema at the lower margin of the right breast before treatment (A). One month after combination therapy with three antibiotics, the sinus tract had healed, and the local erythema had disappeared (B).

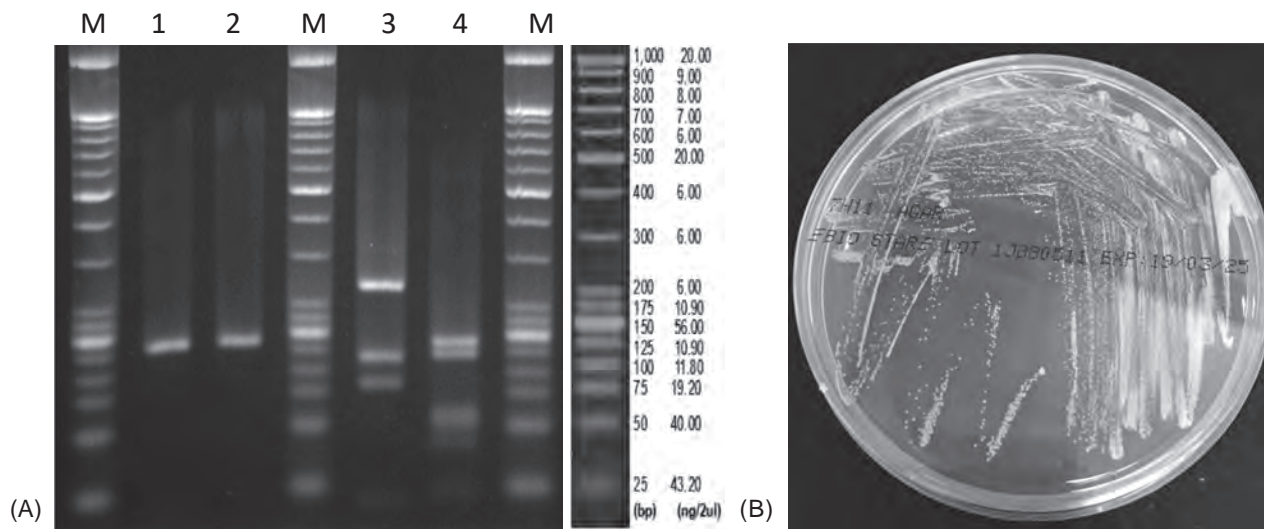


Figure 2. Species identification: PCR restriction-enzyme analysis of the isolate (2A; M: marker; 1: rpoB-MspI: 136 bp; 2: rpoB-HaeIII: 136 bp; 3: hsp65-BstEII: fragments: 235/120/85; 4: hsp65-HaeIII: fragments: 140/125/60/55). Nonpigmented colony on agar (2B).

Table 1. Drug susceptibility test of *Mycobacterium conceptionense* for the patient

Drug	MIC	Interpretation
Trimethoprim/sulfamethoxazole (SXT)	> 8/152	R
Ciprofloxacin (CIP)	> 4	R
Moxifloxacin (MXF)	1	S
Cefoxitin (FOX)	64	I
Amikacin (AMI)	< 1	S
Doxycyclin (DOX)	0.25	S
Tigecycline (TGC)	0.5	No definition
Clarithromycin (CLA)	< 0.06	S
Linezolid (LZD)	8	S
Imipenem	8	I
Cefepime (FEP)	> 32	No definition
Amoxicillin / clavulanic acid 2:1 ratio (AUG)	32/16	No definition
Ceftriaxone (AXO)	> 64	No definition
Minocycline (MIN)	< 1	No definition
Tobramycin (TOB)	8	R
Positive control	Positive	

and the nodule became softer gradually; the prednisolone was discontinued 2 weeks later (Figure 3B). The patient finished 4 months of treatment and then discontinued antibiotics. Three weeks later, nodules reappeared at the patient's left breast. The same three-antibiotic combination regimen was readministered.

Two months passed, and a new erythematous nodule appeared. Neither further intervention nor a regimen change was provided. Greenish discharge from the erythematous nodule followed one week later. Although no therapeutic adjustments were made, the erythematous nodule disappeared, and the sinus gradually healed. Another 5-month course of antibiotics was given for the recurrence. Then, after a total of 9 months of antibiotic treatment and 5 months without antibiotics, no additional recurrences were found.

Discussion

NTM mastitis has been reported before and is usually caused by RGM, mostly *Mycobacterium abscessus* or *M. fortuitum*⁴⁻⁷. The pathogens can be introduced by trauma or cosmetic surgery, and some

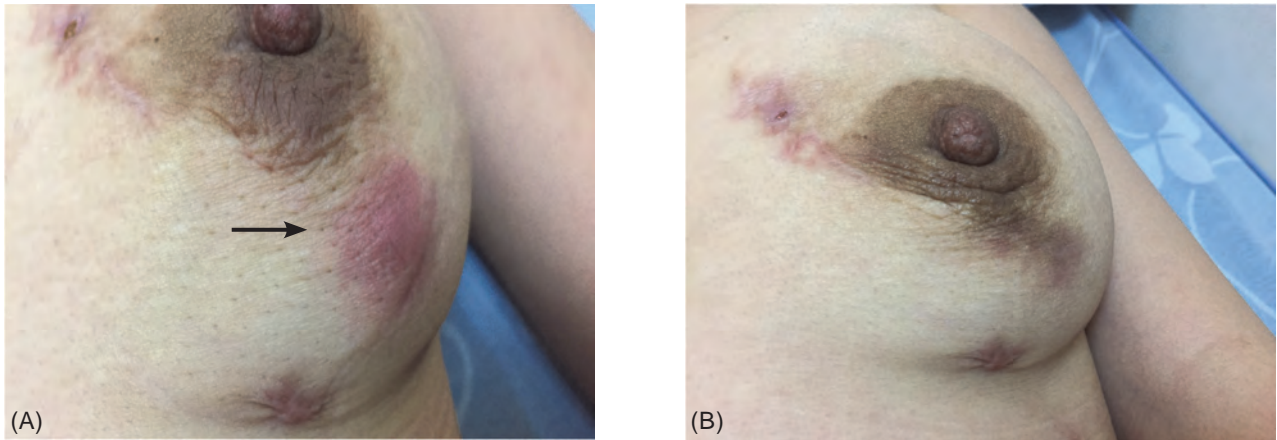


Figure 3. Paradoxical reaction: A new erythematous nodule appeared at the left breast after 2 months of treatment (arrow), when the sinus tract of the right breast had healed (A). Prednisolone was prescribed for 2 weeks; the nodule became soft, and the erythema darkened (B).

are reported as occurring spontaneously^{1,5}.

M. conceptionense has been found in the water and soil, and it has been reported to cause soft tissue infection^{2,8}. To the best of our knowledge, this is the first time that mastitis caused by this pathogen has been reported.

The signs and symptoms of NTM mastitis vary, ranging from local erythema or a nodule or mass, to abscess or sinus tract formation. It usually takes a long time for NTM mastitis to arouse clinical suspicion. When the condition is related to surgery, symptoms usually appear several weeks to months after the operation^{1,2}. Given its chronic course, NTM must be considered when the infection becomes refractory to treatment.

Molecular identification is needed to identify NTM to the species level. Although commercial kits can be utilized in NTM identification for clinical convenience, many new species can't be determined by this method. For RGM identification, 16S rRNA gene sequencing and *hsp65* gene PRA are generally used. In the present case, 16S rRNA gene sequencing revealed 99% similarity to *Mycobacterium senegalense* and *M. conceptionense* in the GenBank database. The phenotypic characteristics revealed nonpigmented colony growth on culture media. PRA with *rpoB* duplex PCR and

hsp65 PRA revealed fragments compatible with *M. conceptionense* (*hsp65*-HaeIII: 140/125/60/55). The three tests led to the final confirmation of *M. conceptionense*. When whole genome sequencing was done and compared, the pairwise comparative average nucleotide identity (ANI) of *M. conceptionense* and *M. senegalense* is 99.36% (>95%). So, *M. conceptionense* is equal to *M. senegalense*, but different from *M. farcinogenes*⁹.

Of the NTM species reported to cause mastitis, *M. fortuitum* revealed 100% sulfamethoxazole/trimethoprim susceptibility¹⁰. This antibiogram character can differentiate *M. fortuitum* from *Mycobacterium abscessus/chelonae*. While *M. conceptionense* belongs to the *M. fortuitum* group, *M. conceptionense* showed sulfamethoxazole/trimethoprim resistance and a rather high MIC level in the present case and a recent case report². So, molecular identification to the species level and drug susceptibility testing may facilitate the selection of appropriate antibiotics.

The treatment of skin and soft tissue NTM infection needs at least two susceptible antibiotics to be used in combination, and the treatment duration for complicated infection must last at least 4 months¹¹. In the present case, four months of combination antibiotic treatment led to disease recurrence,

and 9 months of therapy resulted in final success for the treatment of *M. conceptionense* mastitis without surgery. As there are few reported cases of *M. conceptionense*, the accumulation of more cases is needed for setting the optimal treatment duration and strategy for the pathogen. Surgery is indicated for extended disease¹¹. In the present case, three susceptible antibiotics were used, and medical treatment alone led to success, without further surgical intervention. Finally, it's worthwhile to note that the erythematous nodule and pus discharge from a sinus appeared during the two treatment courses; the aggravated signs resembled a paradoxical reaction. Steroid treatment was used for the first episode but not the second. Both episodes eventually resolved without antibiotic adjustment.

Conclusion

NTM mastitis is a rare disease entity after surgery. RGM is usually the causative organism. NTM infection must be considered when mastitis is refractory to treatment. Empirical combination antibiotic treatment targeting RGM is reasonable. Given the few reported cases of *M. conceptionense* infection, accumulation of more cases is needed for setting optimal treatment duration and strategy. In the present case, 9 months of treatment with three combined susceptible antibiotics led to a successful outcome for *M. conceptionense* mastitis without further surgical intervention.

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Mycobacterium Conceptionense 乳腺炎發生在一個 使用自體脂肪乳房移植的病人身上— 病例報告

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摘 要

我們在此報告一位使用自體脂肪做乳房移植後感染非結核分枝桿菌(*Mycobacterium conceptionense*)，之後接受九個月的合併抗生素治療後痊癒的個案報告。