



The Challenging Treatment of *Mycobacterium abscessus* After Gluteal Fat Injections in the Dominican Republic: A Rare Pathogen, Becoming a Frequent Problem

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ABSTRACT

A 53-year-old woman presented with sepsis from gluteal cellulitis and abscesses one month after undergoing abdominoplasty and "buttock sculpting" in the Dominican Republic. The patient required numerous debridement and drainage procedures, in addition to IV antibiotics for over two weeks before her sepsis could be controlled. Eventually, the rare pathogen *Mycobacterium abscessus* was identified as the source of her infection. Though uncommon in the United States, non-tuberculous mycobacterial (NTM) infections are increasingly associated with cosmetic surgery procedures performed in foreign countries. Patients infected with this organism often face a delay in diagnosis, an extended hospital stay, multiple surgical debridement, antimicrobial resistance, prolonged antibiotic course, and poor cosmetic results. Clinicians should consider NTM infection in any patient who presents with a surgical site infection after a cosmetic procedure who is not appropriately responding to conventional therapy.

Keywords: Non-tuberculous, Atypical, *Mycobacterium*, Lipotourism, Dominican Republic

INTRODUCTION

This case report demonstrates how an unexpected pathogen can have serious health consequences. The presentation of a NTM infection is variable, and histology, AFB culture, and new technologies like PCR can help make the diagnosis. Involvement of infectious disease and surgical teams is critical for proper evaluation and treatment for a disease process that has proven to have a complicated course and arduous recovery.

CASE HISTORY

The patient is a 53-year old previously healthy woman who presented to the Emergency Room with sepsis from gluteal cellulitis and abscesses one month after undergoing abdominoplasty, abdominal contouring, and bilateral "buttock sculpting" in the Dominican Republic (DR). The patient reportedly had an uneventful surgery where an abdominoplasty was performed, and the harvested fat was autografted into the buttocks through multiple injections. The patient then stayed in the DR in a recovery house where she received a two-week course of postoperative intravenous antibiotics as per protocol before returning to the United States.

Approximately one week after her return, the patient presented to the Emergency Department with fevers, chills, and buttock pain. The patient had no past medical history, took no medications, and was a non-smoker. On exam, the patient was febrile to 102.7°F and tachycardic. The patient had edematous, tender buttocks with extensive areas of induration and fluctuance without crepitus, primarily centered over the bilateral ischial tuberosities. Labs were notable for a WBC of 16.4 K. A CT scan demonstrated extensive soft tissue densities with thickening in the superficial fat of the buttock region and lateral pelvis. There were no significant collections identified other than a small perianal fluid collection in the right ischiorectal fossa. The patient was taken to the operating room for incision and drainage of the buttock abscesses based on clinical picture.

An extensive incision and drainage with debridement was performed over each buttock. Approximately 100 ml of yellow purulent material was drained from each buttock. Additionally, the patient was found to have several other smaller abscesses pockets remaining which were sequentially opened through multiple smaller incisions. All wounds

were debrided and irrigated extensively. The drainage was sent for gram stain and culture. The patient was placed on ceftriaxone, vancomycin, and flagyl as advised by the Infectious Disease (ID) consultants.

The patient initially improved with less tenderness and resolving septic parameters. However, over the ensuing days she spiked temperatures and mounted a leukocytosis. On exam, the primary wounds were healing appropriately. Yet, additional new discrete abscesses were discovered throughout her buttocks requiring incision and drainage. The patient remained subjectively asymptomatic. This course continued for eight days where multiple subsequent incision and drainage procedures were performed.

The original cultures were negative for over a week until they finally demonstrated acid fast bacilli (AFB). To ascertain precise speciation, the specimen was sent to the New York State Department of Health. Based on the smoldering course, it was presumed that this represented a mycobacterial infection, and the patient was continued on broad spectrum intravenous antibiotics (imipenem, ceftazidime, and vancomycin) and oral clarithromycin per revised ID recommendations.

The patient was ultimately discharged on antibiotics and with visiting nursing for wound care, seventeen days after her original operative incision and drainage. Final speciation demonstrated Mycobacterium abscessus two weeks after her inpatient discharge.

DISCUSSION

This clinical scenario is becoming more common as residents of the United States increasingly seek cosmetic surgery internationally. Lipotourism, or cosmetic tourism, has become a popular practice for Americans due to lower costs and patient anonymity [1]. According to a 2002 survey, 3-4% of travelers to Central and South America selected "health treatment" as the purpose for their visit [2]. Though generally routine, these cosmetic procedures can potentially have devastating complications. They tend to present in a delayed fashion, leaving physicians in the United States responsible for diagnosis and treatment without a clear sense of the nature of the operation or conditions under which it was performed. Ironically, the monetary cost to recovery often well exceeds the cost of the original domestic procedure with exceedingly disappointing cosmetic results [1].

Further confounding the care of these patients, surgical site infections associated with lipotourism are caused by pathogens uncommon and unexpected in the United States, such as atypical mycobacterial or non-tuberculous (NTM) infections. The most common NTM infections include *Mycobacterium chelonae*, *Mycobacterium fortuitum*, and *Mycobacterium abscessus* [3]. The first reported case of an atypical mycobacterial infection after liposuction was published in 1990 with a subsequent outbreak of 9 cases in Venezuela in 1998 [4]. There are multiple case reports of both foreign and domestic infections of NTM occurring after a wide variety of procedures, ranging from injections of vitamin preparations, DPT vaccine, iron dextran and penicillin, in addition to cosmetic surgeries involving fat injection, liposuction, breast/penile implants, cardiothoracic surgery, facelift and blepharoplasty [5-7]. The exact mechanism of infection is not entirely clear, though a possible cause is the use of tap water for cleaning surgical instruments followed by poor sterilization, since NTM are found in biofilms in aqueous systems and are relatively resistant to standard disinfectant techniques. NTM also tend to grow on inert materials, hence the propensity for implants and fat grafts [3].

The clinical presentation of NTM infections can range from cellulitis, abscesses formation, draining sinuses, and/or delayed postoperative wound infection ranging from two to eight weeks after initial operation [8]. Systemic signs of infection are variable [9]. In one study, patients presented with unimpressive cutaneous draining nodular lesions seven weeks post-procedure without systemic signs. The drainage can be malodorous or odor-free. The drainage is usually non-purulent, appearing light yellow and serous. CRP may be elevated [4]. The presentation of NTM infections often may appear deceptively mild at initial evaluation.

In a review of 88 case reports of NTM, Rok and colleagues composed clinical criteria in which NTM should be highly suspected and empirically treated. Major criteria included previous history of aesthetic procedure operation in the last 3 months and minor criteria included negative bacterial culture, no response to routine oral antibiotics in two weeks, localized infection at previous procedure site, and predisposing factor of immunosuppression. The authors note the physical exam skin findings for NTM is slightly different from pyogenic bacterial infections with darker, purplish erythema, likely due to the chronicity of the disease process [10].

The diagnosis of NTM is usually delayed for numerous reasons. The infection runs a smouldering course and is generally only considered after the patient fails conventional antibiotic therapy and initial cultures have been finalized as “negative.” Because the microbiologic confirmation of this infection may be a lengthy process, some advocate other means of diagnosis including the characteristic histologic findings such as central caseous necrosis with amorphous granular debris and presence of Langhan’s giant cells [3,10]. The traditional AFB stain is rapid but has low sensitivity and is not adequate to make the diagnosis. The AFB culture is highly sensitive but can take 6-8 weeks for non-rapidly growing strains. There are newer tests including real-time PCR, restriction fragment length polymorphism (RFLP), and PCR-reverse blot hybridization assay (REBA) which are costly and not yet readily available.

Treatment usually requires aggressive surgical debridement, repeated as more abscesses develop, and long-term macrolide-based antibiotic therapy [3]. Local wound care is often found to be insufficient [9]. The use of negative wound pressure has also been suggested by some surgeons [1]. In a 2008 review of 20 cases of NTM after cosmetic surgery in the DR it took an average of 9 months of antibiotic treatment until patients were cured [2]. This is consistent with other case reports in the literature [3,4]. A literature review by Lin and colleagues recommends a minimum of 4 to 6 months of systemic antibiotic treatment, usually with clarithromycin or fluoroquinolones [11]. One case report of facial injection with autologous fat took a full year of treatment until symptoms resolved completely [12].

CONCLUSION

Most literature on NTM is found in plastic surgery or infectious disease journals. Yet, because of the increase in lipotourism, this is a clinical problem with which general surgeons and internists must become more familiar. Additionally, patient education and a push for greater public awareness of the risks associated with cosmetic tourism are important steps to reverse the current trend that appears to be gaining popularity.

DECLARATIONS

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

REFERENCES

- [1] Cai, Stephen S., Karan Chopra, and Scott D. Lifchez. “Management of *Mycobacterium abscesses* infection after medical tourism in cosmetic surgery and a review of literature.” *Annals of Plastic Surgery*, Vol. 77, No. 6, 2016, pp. 678-82.
- [2] Furuya, E. Yoko, et al. “Outbreak of *Mycobacterium abscesses* wound infections among “lipotourists” from the United States who underwent abdominoplasty in the Dominican Republic.” *Clinical Infectious Diseases*, Vol. 46, No. 8, 2008, pp. 1181-88.
- [3] Rüegg, Eva, et al. “Multisite infection with *Mycobacterium abscesses* after replacement of breast implants and gluteal lipofilling.” *Case Reports in Infectious Diseases*, Vol. 2015, 2015.
- [4] Zosso, Caroline, et al. “Post liposuction infections by rapidly growing mycobacteria.” *Infectious Diseases*, Vol. 47, No. 2, 2015, pp. 69-72.
- [5] Devi, DR G., et al. “Injection site abscesses due to *Mycobacterium fortuitum*: A case report.” *Indian Journal of Medical Microbiology*, Vol. 21, No. 2, 2003, p. 133.
- [6] Schlarb, D., et al. “Successful interdisciplinary radical treatment of *Mycobacterium fortuitum* infection in a lipotourist from Germany after abdominoplasty in Turkey.” *New Microbes and New Infections* Vol. 8, 2015, pp. 21-23.
- [7] Galea, L. A., and S. Nicklin. “*Mycobacterium abscesses* infection complicating hand rejuvenation with structural fat grafting.” *Journal of Plastic, Reconstructive & Aesthetic Surgery*, Vol. 62, No. 2, 2009, pp. e15-e16.
- [8] Lim, Jong Min, Jong Hwan Kim, and Ho Jik Yang. “Management of infections with rapidly growing mycobacteria after unexpected complications of skin and sub-cutaneous surgical procedures.” *Archives of Plastic Surgery*, Vol. 39, No. 1, 2012, p. 18.
- [9] Engdahl, R., et al. “Management of *Mycobacterium abscesses* post abdominoplasty.” *Aesthetic Plastic Surgery*, Vol. 38, No. 6, 2014, pp. 1138-42.

- [10] Kim, Hyung Rok, et al. "Empirical treatment of highly suspected nontuberculous mycobacteria infections following aesthetic procedures." *Archives of Plastic Surgery*, Vol. 41, No. 6, 2014, pp. 759-67.
- [11] Lin, Shih-Sen, Chin-Cheng Lee, and Tsrang-Neng Jang. "Soft tissue infection caused by rapid growing Mycobacterium following medical procedures: Two case reports and literature review." *Annals of Dermatology*, Vol. 26, No. 2, 2014, pp. 236-40.
- [12] Yang, Ping, et al. "*Mycobacterium abscesses* infection after facial injection with autologous fat: A case report." *Annals of Plastic Surgery*, Vol. 78, No. 2, 2017, pp. 138-40.