

Recurrent Skin and Soft Tissue Infection following Breast Reduction Surgery Caused by *Gordonia bronchialis*: A Case Report

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Summary: The expanding knowledge of the breast microbiome and its constituents necessitates understanding of how it plays into human disease. Consideration of how to identify novel organisms in breast tissue is a topic of hot debate. We report a case of a 26-year-old woman with repeat incisional break-down and sanguinopurulent drainage who required repeat incision and drainage procedures after bilateral breast reduction. Cultures revealed no growth until 4 months postoperation when matrix-assisted laser desorption/ionization-time of flight (MALDI-TOF) revealed *Gordonia bronchialis*, a fastidious, slow-growing organism. To date, there are fewer than 30 reported cases of *G. bronchialis* infections and only one with breast involvement. Our patient required 6 weeks of amoxicillin-clavulanate therapy and frequent follow-up for symptom resolution. This case demonstrates the need for additional microbiologic data in patients with delayed, persistent infections after breast surgery. (*Plast Reconstr Surg Glob Open* 2022;10:e4395; doi: 10.1097/GOX.0000000000004395; Published online 10 June 2022.)

G*ordonia* species are ubiquitous, aerobic actinomycetes and uncommon human pathogens. The genus was first described in 1971 as a weakly acid-fast organism isolated from the sputa of patients with pulmonary disease.¹ *Gordonia bronchialis* has been isolated from environmental samples and prosthetic materials, and has been reported as an opportunistic infection in humans. Its fastidious nature makes it difficult to identify microbiologically. However, recent incorporation of novel identification methods such as 16S rRNA sequencing and matrix-assisted laser desorption/ionization-time of flight (MALDI-TOF) have facilitated its accurate identification.^{2,3} Infections due to *Gordonia* species have largely been reported in immunocompromised patients, in those with indwelling prosthetic material, and with surgical procedures.⁴⁻⁶ To our knowledge, there has only been one previously reported case of a breast infection due to *G. bronchialis*. In that case, the patient was an immunocompetent

woman evaluated for recurrent breast abscesses with a *G. bronchialis* isolate from 16S rRNA sequencing. She had no prior history of breast surgery.⁷ We describe a case of a complicated, persistent postoperative skin and soft tissue infection in a breast reduction patient due to *G. bronchialis*.

Breast reduction is a single-stage surgical procedure involving the excision of breast tissue to reduce patients' physical and psychosocial symptoms. This can involve varying techniques with complications such as infection, hematoma, seroma, fat necrosis, and aesthetic changes.⁸⁻¹⁰ With establishment of the breast microbiome and its implications in disease, it is crucial to discover, discern, and report benign microorganisms from pathologic ones.¹¹⁻¹³ Due to the breast's microbiome diversity, breast surgical cases are classified as a clean-contaminated wound class when compared with the other subcutaneous surgeries that are classified as a clean wound class (CDC surgical site prevention article). Despite this milieu, infection rates after breast reduction surgery range from only 1% to 2%, similar to clean cases.¹⁴ This case provides evidence for *G. bronchialis* as a plausible organism for patients with persistent breast infection in the late postoperative period.

This case report, and its included data, was completed according to SCARE protocols for reporting case reports.¹⁵

CASE PRESENTATION

A 26-year-old woman presented to the plastic surgery department with bilateral symptomatic macromastia for evaluation of breast reduction surgery. She had a history

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of anxiety, depression, and asthma, but no personal or familial history of breast cancer. On preoperative consultation, both breasts were normal in appearance with no discoloration, induration, dimpling, or nipple retraction. A bilateral breast reduction with a superomedial pedicle was performed by an experienced attending physician, resulting in removal of 625 g of breast tissue from the left breast and 600 g of breast tissue from the right breast. Histologic examination revealed ductal hypertrophy but was otherwise unremarkable. The wound bed was irrigated with bacitracin solution before closure. Polydioxanone and Monocryl suture were utilized for closure. Surgery was well-tolerated without complication. Total operative duration was 144 minutes. The patient received standard preoperative antibiotic of cefazolin before incision, and no postoperative antibiotics were prescribed.

Her immediate postoperative at-home course and follow-up visits were uneventful up until 2 months after the surgery when the patient experienced a “pimple-like” mass on the right breast that erupted and drained odorless, sanguinopurulent material (Fig. 1). After a week of washing the affected area with soapy water daily, it resolved and was presumed to be a suture granuloma. However, a superficial wound full-thickness through dermis became present at the “T” junction of the incision. There were no cultures taken at this time.

Four months after surgery, the patient started experiencing a peeling, burning sensation in her right breast, noting hardened nodules on examination along the

inframammary flap suture line and around the areola. At the medial and lateral portion of the inframammary flap, granulation tissue and fibrinous slough were present and underlying sutures were removed. Her presentation at this time was suggestive of the development of fat necrosis, causing the induration or delayed onset infection. The patient was started on empiric cephalexin. The following week her wounds demonstrated resolution at the inframammary flap, but a worsening breakdown around the nipple areolar complex. Repeated incision and drainage was needed with worsening symptoms of burning and pain, accompanied by sanguinopurulent drainage. Specimens were obtained for microbiologic evaluation, and the patient was prescribed trimethoprim-sulfamethoxazole. Cultures analyzed by MALDI-TOF revealed *Gordonia bronchialis*, for which infectious disease was consulted.

The patient was placed on a trial of amoxicillin-clavulanate for 2 weeks after review of literature regarding antibiotic sensitivities. Susceptibility reports on fastidious organisms such as *Gordonia bronchialis* are not routinely generated and typically require specialty testing performed by a few laboratories, which often has to be sent out for further and more sensitive testing. Prior literature has described sensitivity to amoxicillin-clavulanate and trimethoprim-sulfamethoxazole.¹⁶ After consultation with infectious disease, the patient was continued on amoxicillin-clavulanate for a total of 6 weeks. Symptom reduction began at 2 weeks, and the patient reported resolution of symptoms after the full course (Fig. 2). However, the patient’s symptoms of purulent discharge recurred from a different, smaller site, and cultures again revealed *G. bronchialis*. The patient was restarted on amoxicillin-clavulanate, with complete resolution after completion. Patient is currently feeling great, and incision sites are well healed without open wounds, drainage, or erythema.



Fig. 1. Right inframammary fold lesion, 2 months postoperative before incision and drainage procedure.



Fig. 2. Right inframammary fold lesion, 5 months postoperative and 2 weeks after amoxicillin-clavulanate administration.

CONCLUSIONS

This is the first known case report of *G. bronchialis* complicating a breast surgery. The time of onset and incision site breakdown is similar to what has been reported in the cardiac surgery literature. The location and proximity of wounds at the incision sites was initially credited to suture granuloma formation resulting in extrusion, especially because initial cultures were negative. However, future similar cases should include infectious etiologies with the consideration of the current microbiome discussion.^{17,18}

Other case reports of *G. bronchialis* have an average onset to infection of 2–3 months.^{19,20} When no prosthesis is present and a patient presents with continued surgical site infections, it is imperative that the surgeon examine further patient factors and other external factors. While ensuring that the patient is immunocompetent, it is also critical to begin exploring less common causes of infection including rare fastidious organisms. Postoperative antibiotics also do not change the course of these infections and should be suspected regardless of prophylaxis.²¹ Such organisms include other *Actinobacter* species and *Bacteroides* species, for example, and tend to be anaerobic species with similar onset of infection timepoints to *G. bronchialis*, or around several weeks.

If initial culture data are unrevealing, additional specimens should be obtained for specific testing to evaluate for atypical or fastidious organisms. Sequencing tests such as 16S r-RNA provide ample coverage for the organisms listed above because they are not time-dependent and require small amounts of the target organism for analysis.²² This is with recognition that many of the advanced techniques utilized in the identification of this organism are not readily available to most, or that it must be specifically requested to establish. MALDI-TOF, 16S r-RNA analysis, and related technologies are increasing in accessibility, but are still limited to larger hospitals or hospital conglomerates. Therefore, a push for expanding the identification of organisms in breast tissue should be pursued in the context of the expanding microbiome in breast tissue.

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