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Letter to the Editor

Mycobacterium fortuitum complicating breast prosthetic implant

A B S T R A C T

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Breast implant-related infections are uncommon and are usually caused by skin commensals. However, with the routine use of perioperative broad-spectrum antibiotic prophylaxis, infections caused by rare organisms are being increasingly reported. This report summarises a rare infection of breast prosthesis in a young female who underwent augmentation mammoplasty using silicone prosthesis. Prosthesis removal and a prolonged course of anti-microbial therapy were required for eradication of the infection.

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Dear Sir,

Prosthesis for breast augmentation is increasingly being used for reconstructive and cosmetic purposes. Although breast implant-related infections are uncommon, they are usually caused by skin commensals, like *Staphylococcus aureus* and the coagulase negative staphylococci.¹ However, with the use of perioperative antibiotic prophylaxis infections with rare organisms are being increasingly reported. Herein, we describe a case of breast implant infection caused by *Mycobacterium fortuitum*.

A 38-year-old home-maker underwent wide local excision of the primary breast cancer and axillary lymph node dissection followed by augmentation mammoplasty using silicone implant insertion in the retro-mammary space. A combination of 1.2 g of amoxicillin and clavulanic acid was administered parenterally prior to skin incision as antibiotic prophylaxis as per hospital policy. The same combination was continued as oral preparation 625 mg three times a day for 5 days following surgery. The patient made uneventful recovery after surgery and was discharged with healthy wound on post-operative day 5. Three weeks after surgery, the patient reported back with complaints of purulent discharge through an opening in surgical wound. On examination, 1 cm opening was noted in the wound with purulent brownish coloured discharge and protruding implant through the

wound. The wound was tender on palpation and local temperature was raised. Ultrasound of breast showed peri-prosthetic collection and herniation of implant through skin. Systemic examination was within normal limits. The wound was laid open to drain the pus. Routine blood investigations were sent and pus was sent for routine bacterial work-up, Gram stain, Ziehl-Neelsen stain and culture, fungal stains and culture. The patient was started on oral linezolid 600 mg twice daily. Blood investigations showed the following values: haemoglobin 12.1 g/dL, white blood cell count $6.6 \times 10^3/\mu\text{L}$ (neutrophils 64%, lymphocytes 26%), platelets $271 \times 10^3/\mu\text{L}$, erythrocyte sedimentation rate 83 mm/h, blood urea 16 mg/dL and creatinine 0.7 mg/dL. Routine bacterial culture of pus did not reveal any growth. However, Ziehl-Neelsen staining showed acid fast bacilli. Hence, keeping the possibility of a non-tuberculous mycobacterium (NTM), oral clarithromycin 250 mg twice daily was added to linezolid 600 mg twice daily. The sample was inoculated on LJ media and BACTECTM MGITTM 960. The culture grew on the 5th day, colonies were non-chromogenic and gave niacin test negative, reduced nitrates, grew on MacConkey agar and were catalase positive. Hence, the culture grown was presumptively identified as *M. fortuitum*. The genomic bacterial DNA of culture isolate was extracted using heat lysis method. The 16S rRNA gene was amplified by PCR and DNA sequencing done with specific primers (forward primer 5'-AGAGTTTGATCCTGGCTCAG,

Fig. 1 – Photograph of the removed implant with the macerated edge of infected breast wound in the background (left). The infected implant has a blue hue, while the new implant (right) is colourless.

reverse primer 5'-GTCCTGTGCATGTCAAACCC). The cycling conditions for 16S rRNA PCR were briefly, 35 cycles of 94 °C for 1 min, 60 °C for 1 min and 72 °C for 2 min. Cycle sequencing was performed using BigDye terminator ready reaction cycle sequencing kit (PE Biosystems, Foster City, CA) and the products were loaded in the ABI prism 310 genetic analyser (PE Biosystems), as instructed by the manufacturer. DNA sequences thus obtained were analysed by running BLAST analyses in NCBI database targeting 16S rRNA gene. Sequence similarities of 16S rRNA genes ranged from 99% to 100% with *M. fortuitum*. Sequences thus obtained were submitted to the GenBank (GenBank accession number KP974712). Antibiotic susceptibility was performed by broth microdilution method as per CLSI guidelines.² MICs obtained were linezolid ≥ 32 $\mu\text{g/mL}$ (resistant), ciprofloxacin 2 $\mu\text{g/mL}$ (intermediate susceptible) and clarithromycin 4 $\mu\text{g/mL}$ (intermediate susceptible).

Copious amount of pus discharge continued from the wound despite the antibiotic treatment for 5 days. The implant had to be removed (Fig. 1) and the wound was regularly irrigated with hypertonic saline. Within a week's time after implant removal, the wound dried up and was closed by secondary suturing and the patient was discharged with the advice to take clarithromycin 250 mg twice daily and ciprofloxacin 500 mg twice daily for 3 months. At 3 weeks follow-up, the wound healed completely.

M. fortuitum is a NTM classified in Runyon group IV, rapid growers. It is widely distributed in environment in various water sources, soil and sewage.³ *M. fortuitum* may cause infections following surgery or trauma after contamination of the wound, medical device implantation and injection site abscesses. Disseminated disease is usually seen in immunocompromised patients, such as individuals who are human immunodeficiency virus-positive or have received a course of chemotherapy or corticosteroid treatment.⁴ The true incidence of *M. fortuitum* infection is unknown, but it has been estimated to be from four to six cases per one million.⁵ Few cases of *M. fortuitum* induced infection follow implant-based breast reconstruction.^{6–9} Though the exact route of infection is not clear, it is probably transmitted during surgery through contaminated disinfectant solutions like quaternary ammonium solution (poor mycobactericidal activity) or instruments

rinsed with tap water, as non-tuberculous mycobacteria colonise hospital water systems. Some authors have also suggested the possibility of skin colonisation and inoculation during surgery.^{10,11}

The disease progression is slow and incubation period can vary from one week to over two years.¹² Hence, these infections may not manifest during early postoperative period as has been in our patient. Our patient was discharged with a presumptively healthy wound 5 days after surgery and infection manifested only 3 weeks later. The slow progression and absence of systemic signs and symptoms as seen in our patient suggest low pathogenic potential of *M. fortuitum*.

M. fortuitum is generally susceptible to multiple antibiotics, including amikacin (100%), ciprofloxacin and ofloxacin (100%), sulphonamides (100%), imipenem (100%), clarithromycin (80%), doxycycline (50%) and cefoxitin (50%).³ Serious skin and soft tissue infections require therapy with at least two agents, for a minimum of 4 months to provide cure. Surgical debridement is generally indicated for extensive disease along with removal of foreign bodies such as breast implants.³ In spite of early institution of antibiotic therapy it was not possible to salvage the implant in this patient.

Experience with this postoperative complication due to non-tuberculous mycobacteria is limited as it represents only a minority of the pathogens responsible for peri-prosthetic infections. To achieve earlier diagnosis, the clinician should have a high index of suspicion in a patient without systemic signs and symptoms, negative preliminary cultures and a peri-prosthetic infection that fails to resolve following a course of conventional antimicrobial treatment. With timely diagnosis and appropriate treatment, non-tuberculous mycobacterial peri-prosthetic infections can be managed successfully without compromising final outcome. Infections due to these atypical organisms are expected to rise due to increasing use of prosthesis and we might need antibiotic prophylaxis covering these organisms in future.

Conflicts of interest

The authors have none to declare.

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