Case Report

An injection abscess due to *M. fortuitum*: A rare case report

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Abstract

An iatrogenic injection abscess is usually easy to treat if caused by aerobic bacteria but some rapidly growing mycobacteria (RGM), namely, *Mycobacterium fortuitum, M. chelonae, and M. abscessus* are associated with postinjection abscess and may cause delayed wound healing. RGM can cause mild localized cellulitis or abscess to osteomyelitis following penetration injuries or unsafe injection practices. A 7-year-old girl was presented to pediatric surgery OPD with abscess formation over the right buttock. Incision and drainage from abscess were performed in OPD and pus sample was sent for aerobic bacterial culture and sensitivity. On gram stain plenty of pus cells with no microorganism were seen and growth on blood agar after 48 h of aerobic incubation at 37°C showed small off-white pinpoint, smooth butyrous waxy colonies. Smear prepared from blood agar showed uniformly stained short, slender, faintly stained gram-positive bacilli, for which acid-fast staining (1% and 20% H_2SO_4) was performed that showed acid-fast bacilli. The isolate was further identified by the molecular method and was confirmed to be *Mycobacterium fortuitum* by genotype Mycobacterium CM VER 1.0 (HAIN LIFESCIENCE, BioMerieux India Pvt. Ltd.).

Keywords: Injection abscess, *mycobacterium fortuitum*, rapidly growing mycobacteria

Introduction

An iatrogenic injection abscess is usually simple to treat. Microorganisms like *Staphylococcus aureus, Pseudomonas* species, *Klebsiella* species, *Escherichia coli,* etc., are commonly associated with postinjection abscess. The three most important species of rapidly growing mycobacteria (RGM) producing disease in humans are *Mycobacterium fortuitum, M. chelonae, and M. abscessus* which are associated with postinjection abscess.[1] Literature shows RGM can cause localized abscess following vitamin injection, DPT vaccine, iron dextran, and penicillin injection. They are ubiquitous in the environment found in soil and tap water. Da Costa Cruz first reported injection abscess due to *M. fortuitum* from dextran injection. The report of postinjection abscess due to RGM from India is limited.[1,2]

The *M. fortuitum* group accounts for the majority of the cases of localized cutaneous infections caused by RGM.[1] They can lead to mild localized cellulitis or abscess to osteomyelitis following penetration injuries or unsafe injection practices.[3] Infection by RGM causes delayed wound healing with chronic serous discharge which requires a prolonged course of antibiotics. Therefore, early clinical suspicion and identification are essential to treat this infection which can lead to nonhealing wounds if untreated. Hence, we report a rare case of injection abscess due to *M. fortuitum*.

Case Report

A 7-year-old girl was presented to pediatric surgery OPD with complaints of swelling over the right buttock associated with

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mild fever and pain in the right buttock for 15 days. She had a history of injection over right buttock 1 month back by a local practitioner followed by which she developed abscess over right buttock which was gradually increasing in size. On local examination, swelling over the right gluteal region was seen of the size of 3 × 4 cm. She was investigated for complete blood count which shows a mild decrease in hemoglobin level of 10.2 g/dL, a platelet count of 662 × 10^3/μL, and a white cell count of 11.14×10^3/μL(neutrophils-7.32×10^3/μL;monocytes-1.30×10^3/μL; lymphocytes- 2.32 × 10^3/μL; eosinophils-0.17 × 10^3/μL; basophils-0.03 × 10^3/μL). Incision and drainage from abscess were performed in OPD and pus sample was sent for aerobic bacterial culture and sensitivity. In the microbiology laboratory, gram staining and culture on blood agar and MacConkey agar were done. On gram staining, plenty of pus cells with no microorganism were seen and growth on blood agar after 48 h of aerobic incubation at 37°C showed small off-white pinpoint, smooth butyrous waxy colonies [Figure 1] whereas on MacConkey agar without crystal violet small, smooth, dome-shaped colonies with pink pigmentation [Figure 2] were seen. Smear prepared from blood agar showed uniformly stained short, slender, faintly stained gram-positive bacilli, for which acid-fast staining (1% and 20% H_2SO_4) was performed that showed acid-fast bacilli with 1% H_2SO_4. However, to confirm these culture findings Ziehl-Neelsen staining was performed directly from the pus sample and we found a few short, slender, uniformly stained acid-fast bacilli [Figure 3]. On further identification by biochemical tests isolate was found to be catalase-positive and reduced nitrate to nitrite, Lowenstein-Jensen (LJ) media within 48 h off-white color, smooth hemispherical with butyrous consistency [Figure 4]. On performing antimicrobial susceptibility tests, the isolate was susceptible to cotrimoxazole, ciprofloxacin, amikacin, polymyxin-B, moxifloxacin, and meropenem. The isolate was further identified by the molecular method and was confirmed to be *M. fortuitum* by genotype Mycobacterium CM VER 1.0 (HAIN LIFESCIENCE, BioMerieux India Pvt. Ltd.) [Figure 5].[4] Based on antimicrobial susceptibility testing results, the clinician changed the line of treatment to quinolones and during follow-up, there was a decrease in the size of the swelling and recovery was uneventful.

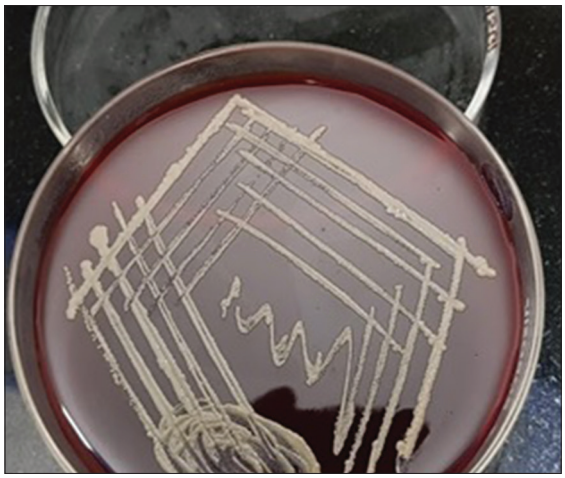

Figure 1: Growth on blood agar (small off-white colonies)

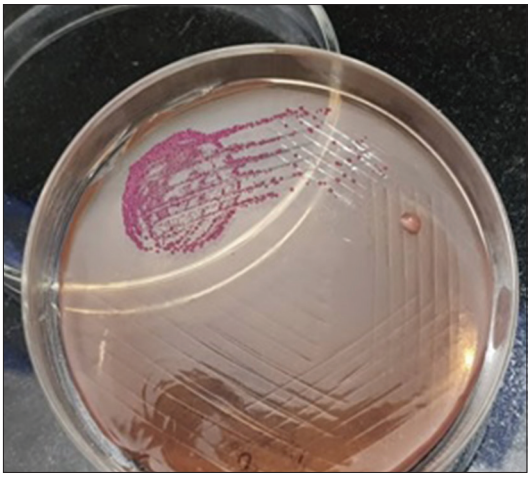

Figure 2: Growth on MacConkey agar

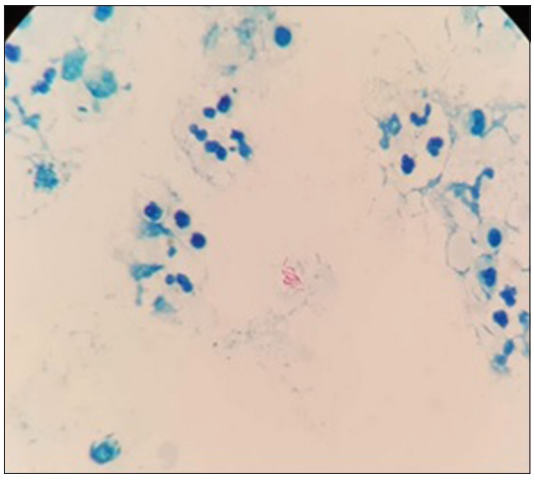

Figure 3: Ziehl-Neelsen Staining from pus sample (acid-fast bacilli were seen)

Discussion

Non-tubercular mycobacteria (NTM) has emerged as an important human pathogen causing a variety of localized cutaneous infection to disseminated diseases and healthcare-associated infection. RGM types of NTM are known to cause skin and soft tissue infections, disseminated cutaneous infection, cervical lymphadenitis, musculoskeletal infections, pulmonary infections, etc., These are acid-fast bacilli, a saprophytic and major cause of trauma abscess infection. They are not responding to the routine antibiotic so identification is essential.[3]

M. fortuitum and *M. chelonae* are the most common RGM associated with abscess formation or cutaneous infection, the 3rd RGM is *M. abscessus* which may be considered a part of *M. chelonae* complex. It is difficult to differentiate *M. abscessus* from *M. chelonae* but *M. abscessus* can cause severe disease and highly resistant to antimicrobials. Hence, the molecular method is very important which can differentiate the RGM.[3]

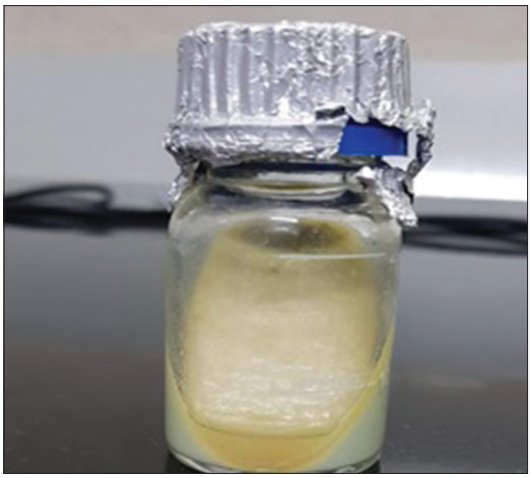

Figure 4: Growth on LJ media

Nosocomial outbreaks of *M. fortuitum* skin infections have been associated with exposure to a contaminated ice machine and contamination of an automated bronchoscope disinfection machine.[5]

The RGM vary in their *in vitro* susceptibility to antimicrobial agents. e.g. most isolated of *M. fortuitum* group are sensitive to cotrimoxazole, whereas virtually all *M. chelonae*/*M. abscessus* group are resistant. Most of the *M. fortuitum* group, *M. smegmatis* group, and *M. mucogenicum* are sensitive to imipenem, most *M. chelonae* are sensitive to tobramycin and most *M.abscessus* are sensitive to amikacin. Hence, antimicrobial susceptibility testing should be performed on all clinically significant isolates of RGM.[3] The *M. fortuitum* group is easily differentiated from the *M. chelonae-M. abscessus* group by agar disk diffusion susceptibility to polymyxin B. Isolates of the *M. chelonae-M. abscessus* group exhibit no complete or partial zone of inhibition around this drug, in contrast to the *M. fortuitum* group, which shows zones of inhibition around polymyxin B.[6]

Nagore *et al*.[7] (2001) reported 3 cases of cutaneous infection with *M. fortuitum* after localized microinjections (mesotherapy). Suvanasuthi *et al*.[8] (2012) reported *M. fortuitum* cutaneous infection from the amateur tattoo. Mok *et al*.[9] (2016) showed that GenoType NTM-DR had 100% specificity for identifying *M. chimaera***.** Yedale *et al*.[10] (2017) also performed GenoType® MTBDR plus assay (Hain Life Science, Germany) to confirm MTBC confirmed liquid cultures for first-line antitubercular drug resistance, frequency, and mutational analysis.

Local unsafe injection practices and lapse in aseptic techniques lead to non-healing wound with soft tissue infections due to RGM. The clinician should suspect these infections along with common microbial pathogens causing wound infections as RGM differ in their susceptibility pattern and different RGM needs different modality of treatment so microbiological identification and susceptibility are very important. RGM are common saprophytic environmental contaminants but if any breach in any sterile techniques occurred, it can lead to pathogens. Therefore,

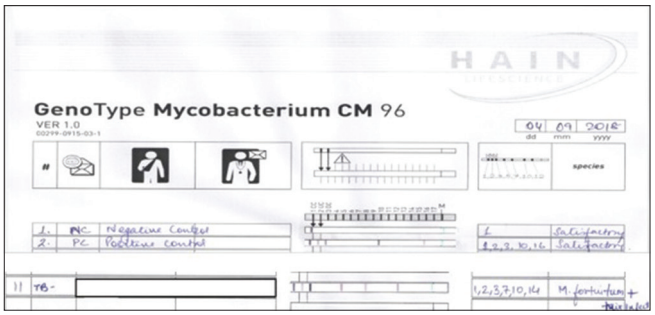

Figure 5: *M. fortuitum* detection by genotype Mycobacterium CM 96

regular environmental surveillance might reduce primary RGM infections in the healthcare setting.

Conclusion

RGM continues to be an important human pathogen that can cause a variety of diseases from localized cutaneous infections to disseminated disease. NTM should be kept in provisional diagnosis along with common bacterial infectious causes so that NTMs are not missed and the patient receives proper management. Hence, communication between clinician and microbiologist is essential for correct diagnosis to identify NTM to the species level and perform susceptibility testing to choose the most effective drug therapy.[1]

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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