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Case Report

Atypical Raoultella Ornithinolytica Infection Following Cosmetic Breast Reduction Surgery Abroad - A Case Report

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Abstract

Background: Raoultella ornithinolytica is a rare encapsulated gram-negative facultative anaerobe bacterium belonging to Enterobacteriaceae family. Raoultella orthinolytica is a rare cause of infections in humans. It is an under-reported, virulent pathogen found in community and hospital acquired infections following invasive procedures. Infections attributable to Raoultella ornithinolytica are relatively serious presenting as bacteraemia, sepsis, pneumonia, joint infections, biliary infections and peritonitis. However, it has not been identified as the sole pathogen in infected wounds following clean procedures like breast reduction surgery. A case of polymicrobial involvement with Raoultella ornithinolytica after breast reduction has been reported in one study [(1)].

We report a case of wound infection after breast reduction surgery solely caused by Raoultella ornithinolytica. The aim of the study is to make surgeons cautious of virulent wound infections with otherwise uncommon micro-organisms in patients who have had surgeries abroad.

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Introduction

Raoultella ornithinolytica was first described in 1989 by Sakazaki et al.[1] Initially classified as a Klebsiella species, it is now considered a separate species because of ribosomal variations and gene sequencing. It is a rare encapsulated gram-negative organism that is both commensal and free living in the environment. As a group, they have been described in several aquatic and non-aquatic environments including hospital settings. The organism is universally found in natural environments and it is not expected to have any geographical focal point. Nevertheless, we suspect that most likely our patient got infected with R. ornithinolytica during the operation in Turkey or potentially postoperatively as a travel-related infection because of exposure to a cosmopolitan community at airports and recycled air within the aircraft in a relatively immunocompromised post-surgery state.

There have been several suggested risk factors associated with Raoultella infections. Notable among these are previous long-term antibiotic therapy, uncontrolled diabetes mellitus, immunosuppression, intensive care unit stay and indwelling catheters. As it is an encapsulated organism, patients with hyposplenism are particularly susceptible to this infection. Our patient had no co-morbidities.

Interestingly, our patient had only signs of localized left breast wound infection and malaise. Her blood tests, especially inflammatory markers, were normal. Other sources of infection or bacteria were not identified. Normal blood results in such patients may not provide clinicians with a false complacence. Therefore, patients should be treated with antibiotics and close observation with vigilance should be undertaken, keeping in view the unique manifestations of atypical bacteria acquired in diverse foreign territories, that if left untreated could lead to adverse outcomes.

Ayoade et al. has reported fat necrosis and wound

infection after breast reduction with R. ornithinolytica, Escherichia coli and Enterococcus faecalis.[2] Tissue destruction and fat necrosis, attributed to Raoultella ornithinolytica in the study was treated with surgical debridement. However, no tissue destruction or fat necrosis was seen in our case and the infection settled with antibiotics. Likely R. ornithinolytica on its own does not cause fat necrosis. We surmise that fat necrosis might have been caused by E. coli or Enterococcus faecalis alone or in combination. Seng et al. reported that among all of 112 cases of R. ornithinolytica infection, only 13% were found with wound and skin infections. The rest were respiratory, biliary and gastrointestinal infections.[3,4,5]

Additionally, almost half were hospital acquired infections related to invasive procedures.[2] Antimicrobial treatment might be challenging due to resistance to different antibiotics. Raoultella ornithinolytica expresses beta-lactamase, which provides resistance to commonly use aminopenicillins.[1,3,4] The presence of a chromosomal bla gene is quintessential to its beta-lactamase resistance.[2] Furthermore, it usually remains undetected in basic bloodlines making it even more challenging and menacing.

Case Presentation

A 34-year-old female patient, presented to the Plastic Surgery department with an infected wound on the left breast with purulent discharge and generalized symptoms of lethargy, nausea and vomiting, loss of appetite, and headache. She underwent a bilateral breast reduction operation in a private hospital in Turkey, she recovered in the hospital and travelled back to the United Kingdom on the 7th post-operative day. Her initial postoperative period was uneventful, but on day 10 she noticed wound breakdown in her left breast with increasing pain and purulent discharge. The wound was swabbed in community and she was treated with Flucloxacillin 1 gram four times a day for three days.

Microbiology report revealed a profuse growth of Raoultella ornithinolytica resistant to amoxicillin, co-amoxiclav and cefuroxime, but sensitive to co-trimoxazole and gentamicin. Due to generalized symptoms and malaise, she was admitted to the hospital. At that time, she was otherwise fit and with no co-morbidites. The patient had mild tachycardia (95 beats per minute) at the time of admission and had a borderline pyrexia of 37.6 degree celsius. Vital signs, inflammatory markers, Carbapenemese-producing enterobacteriaceae (CPE) swabs, culture, CXR and USG of breast were normal. Intravenous co-trimoxazole 960mg twice a day was started as per microbiology advice followed by oral antibiotics after 48 hours. After a hospital stay of 3 days, her left breast wound infection was fully resolved and the patient was discharged. Unfortunately, no follow-up was possible in the NHS due to trust policies.

Discussion

The purpose of this case report is to highlight the fact that even clean surgeries are riddled with the threat of indigenous micro-organisms, non-native to the UK prevailing. International travel in the early postoperative period exposes the newly operated patient to rare, mutant micro-organisms. These have the potential to cause virulent, life threatening infections in even clean and straightforward surgeries. Surgeons in the UK should be cognizant of benign, atypical bacteria causing life threatening sepsis in patients who have had their surgery abroad. 75% of the patients were from a specific country. The importance of culture reports in these cases cannot be underscored enough. While Raoultella ornithinolytica infections are uncommon, their clinical implications are significant, especially in immunocompromised or critically ill patients.[5,6] The emergence of antimicrobial resistance and diagnostic challenges necessitates a vigilant approach to management, including rapid identification, susceptibility testing, and targeted therapy[(6)].

Raoultella ornithinolytica is sensitive to a variety of second to fourth generation cephalosporins. Immediate broad-spectrum antibiotic treatment should be established before accurate microbiological results are obtained.[5,6] When multi-drug resistance is encountered, combination therapies may be warranted. An emergence of carbapenemase-positive Raoultella ornithinolytica has been reported.[6] Our patient did not manifest the presence of Carbapenemase-producing enterobacterales (CPE).

Our patient did not require any surgical intervention as her left breast wound infection improved with conservative management with antibiotics and there were no signs of collection or fat necrosis. In our Plastic surgery department, we have noticed an increasing number of patients seeking medical help after undergoing cosmetic surgery abroad due to wound infection/dehiscence, retained stitches, haematoma, wound abscesses and infected implants. However, an infection caused by Raoultella ornithinolytica, that usually does not infect skin and soft tissues was a rarity.[7] Therefore we wished

to report such incidence.

We advise that patients wishing to travel abroad for plastic surgery should inform their GPs of their intentions, so to be warned of the risks associated with medical tourism. NHS policies in the case of wound infections and surgical failure should be explained in detail. Also, patients should be advised to try to travel as late as possible after surgery to ensure adequate follow-up by the operating surgeon and to avoid contamination and cross-infection in the cosmopolitan ambience of airports when they are in a relatively vulnerable state.

Conclusion

This case demonstrates the significance of expecting and recognizing infections with atypical highly-resistant organisms in otherwise clean surgeries performed abroad including the potential of travel-related exposure to a multitude of mutant microrganisms with mercurial presentations.

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Author's Contribution

Fatima Khan: Interpretation and data analysis, data analysis and interpretation, Critical revision of the article, agreement to be accountable for all aspects of the work and final approval of the version to be published

Muhammad Adil Abbas Khan: Contribution to conception and design of study, Data Interpretation and Analysis and final approval of the version

All authors meet the ICMJE authorship criteria and agree to be accountable for all aspects of the work, ensuring the accuracy and integrity of the research.

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