Case Report

Journal of Medical - Clinical Research & Reviews

Mycobacterium Fortuitum as a Rare Etiology of Red Breast Syndrome: A Case Report and Review of Literature

Benjamin O. Lawson[1*] and Laura Schroeder[2]

[1]*Honor Health Internal Medicine Residency Program, Internal Medicine Resident, 7400 East Thompson Peak Parkway, Scottsdale, AZ, USA.*

[2]*Honor Health Internal Medicine Residency Program, Infectious Disease Physician, AZ, USA.*

[*]Correspondence:
Benjamin O. Lawson, Honor Health Internal Medicine Residency Program, Internal Medicine Resident, 7400 East Thompson Peak Parkway, Scottsdale, AZ, USA, E-mail: Benlawson32@yahoo.com.

Received: 01 December 2017; **Accepted:** 18 December 2017

Citation: Benjamin O. Lawson, Laura Schroeder. *Mycobacterium Fortuitum* as a Rare Etiology of Red Breast Syndrome: A Case Report and Review of Literature. J Med - Clin Res & Rev. 2017; 1(3): 1-3.

ABSTRACT

Mycobacterium Fortuitum is classified as nontuberculous mycobacterium that is described as rapidly growing mycobacteria as they usually grow in subculture within one week. M. Fortuitum is considered the most common RGM from non-respiratory specimens. There have been few reports regarding M. Fortuitum as cause of Red Breast Syndrome after undergoing breast reconstructive surgery with implants. To our knowledge and after literature search, this is the first report of M. Fortuitum cultured status post Breast Reconstructive surgery with tissue expander, not an implant and with no acellular dermal matrix utilized.

Keywords

Red breast syndrome, Mycobacterium fortuitum, Infection.

Background

Based on the 2015 Plastic Surgery Statistics Report, 106,338 females underwent breast reconstructive surgery in the United States [1]. The most common method of breast reconstruction involves the placement of an integral injection port tissue expander beneath the muscle, tissue expansion, and subsequent replacement with a silicone gel implant [2]. Breast reconstructive procedures now more commonly involve the use of acellular dermal matrix (ADM) products, which were introduced in 2005 [3]. Inserting an ADM to help reinforce the soft-tissue pocket for the expander and the later implant has been shown to provide enhanced soft-tissue coverage of the prosthesis and improve control of the inframammary and lateral mammary folds and implant position, resulting in better cosmetic outcomes [3-7].

Infection following breast reconstruction with tissue expanders and implants remains a concern, with a reported incidence that ranges from 1 to 6 percent [8]. Numerous factors may predispose to prosthetic infection such as diabetes mellitus, advanced age, tobacco use, chemotherapy but previous studies have demonstrated an increased complication rate in the setting of prosthetic breast reconstruction and radiation therapy [8]. In 2009, Nahabedian study of 376 patients, found when no acellular matrix used, the overall incidence of infection was 5.85 percent, compared to an overall incidence of 5 percent when an acellular matrix expander was used [8]. This suggests that there is no difference of infection rates if acellular matrix is used or not.

Red Breast Syndrome can represent either infectious or non-infectious etiology. Lack of intervention in a scenario of undiagnosed infectious cellulitis could allow progression to a serious infection, necessitating invasive procedures and possibly removal of the expander or implant [8]. Although the incidence of Red Breast Syndrome is currently unknown, in 2013, Ciciloni et al, reported 6/3109 cases of Red Breast Syndrome as a result of Mycobacterium Fortuitum occurring after prosthetic breast reconstruction performed with human-derived acellular dermal matrix implants [7].

We present a case of patient who developed Red Breast Syndrome after undergoing tissue expander placement without using an acellular dermal matrix product. After further investigation the patient was diagnosed with infection from Mycobacterium Fortuitum. Based on a thorough literature search, this is the first case of Mycobacterium Fortuitum infection after undergoing

tissue expander placement without use of an acellular matrix for Breast Reconstruction surgery.

Case Presentation

A 54 year old otherwise healthy female underwent a left modified radical mastectomy for inflammatory breast cancer and right prophylactic simple mastectomy. Pathology returned as grade 3 invasive ductal carcinoma with one of seven positive lymph nodes in left breast and lobular carcinoma in situ in right breast. It was decided because of her inflammatory breast cancer, she will have delayed reconstruction for more than 1 year post mastectomy radiation therapy.

Five years later, she underwent bilateral breast reconstruction with tissue expanders, left breast wound debridement in preparation for inset of flap measuring 15 x 8cm and left breast latissimus dorsi flap.

Two and a half months later, the patient noticed a small area of redness and thus presented to Plastic Surgeon's office. Secondary to these findings it was decided to directly admit to the hospital for acute right breast pain and redness. On arrival right breast ultrasound was performed revealing multiple fluid collections in the right breast soft tissues about the right breast expander. Labs on admission revealed WBC of 10.1; hemoglobin 11.3; hematocrit of 32.3; sodium of 131; sedimentation rate of 86 and C-reactive protein 6.4. At that admission she was diagnosed with mastitis and IV vancomycin and ceftriaxone was initiated. The patient was then taken back to the operating room two days later where an exchange of right breast tissue expander with another expander and debridement within the breast pocket with lateral and inferior pole capsulotomies. During the procedure, the tissue expander noted to be intact, small amount of cloudy fluid was noted to be within the breast pocket which was sent for culture, and two drains were placed.

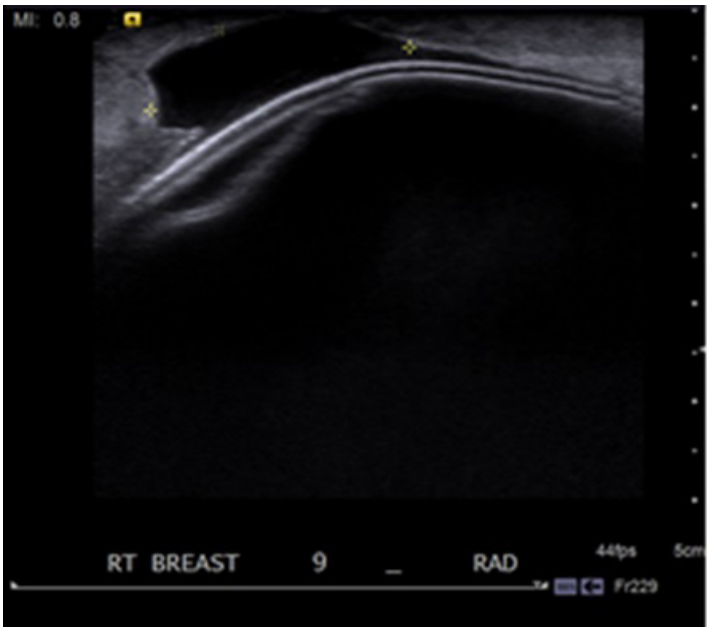

Figure 1: Right Breast Ultrasound showing fluid collections in the right breast soft tissues about the right breast expander with the largest pocket measuring 2.9 x 0.9 x 2.6cm.

Secondary to the intra-operative findings described above, Infectious Disease was consulted and continued IV vancomycin and ceftriaxone as preliminary culture results suggested diphtheroids or bacillus in nature. At that time, it was decided to send home with a drain on oral clarithromycin 500mg BID and doxycycline 100mg BID with close follow up.

Twelve days later, the patient was re-admitted for progression of treatment as further cultures revealed rapid growing mycobacterium species. Per patient, the breast erythema has remained stable since discharge; however she no longer had any pain. Labs on this admission were unremarkable. As, the right breast erythema has not responded to IV or oral antibiotics, the patient underwent explantation of right breast tissue expander with excision of intervening tissue by plastic surgery. Rapid growing Mycobacterium Fortuitum was identified and subsequently a PICC order for administration of amikacin and cefoxitin ensued. The patient's oral antibiotics were held during IV antibiotic administration.

She was discharged home with IV amikacin and cefoxitin through PICC line, and changed to oral ciprofloxacin and clarithromycin based on sensitivities.

Discussion

Mycobacterium Fortuitum is classified as nontuberculous mycobacterium that is described as rapidly growing mycobacteria as they usually grow in subculture within one week. M. Fortuitum is considered the most common RGM from non-respiratory specimens [11]. The nontuberculous mycobacteria's broad spectrum resistance to antimicrobial agents, including chlorine and their low nutritional requirements, enable growth in water distribution systems, soil, dust, and aerosol samples [12,13]. Other unique characteristics of nontuberculous mycobacterium is these organisms possess a hydrophobic, lipid rich cell wall that facilitates the formation of a biofilm on solid surfaces such as water pipes, catheters and theoretically breast implants/tissue expanders [14,15].

As the true source remains unclear, numerous theories can be proposed to further understand the possible etiology of the above patient's Red Breast Syndrome as a result of M. Fortuitum. Theories include the possibility of the nontuberculous mycobacteria gaining access to the surgical wound from the public water system at the time of bathing, already existing amongst the normal skin flora and thus not eliminated by skin preparation preoperatively [16]. These mechanisms would theoretically allow direct inoculation of the tissue expander through the skin incision, however given the lack of other reported M. Fortuitum infections during that period of time and place; these mechanisms may be unlikely. Therefore, one must consider previously contaminated material used, i.e. the tissue expander without human derived acellular matrix already growing non tuberculous mycobacterium.

Initial treatment of red breast syndrome as a result of suspected infection includes empiric antimicrobial coverage [16]. However if there is high suspicion for nontuberculous mycobacterial infection, then it is recommended empiric therapy to include intravenous amikacin plus intravenous cefoxitin and total treatment for a minimum of 3-6 months [16].

There have been few reports regarding M. Fortuitum as cause of Red Breast Syndrome after undergoing breast reconstructive surgery with implants. One example includes that published by Cicilloni et al with findings of only 6/3109 patients who developed RBS and cultures positive for M. Fortuitum [7]. The majority of papers have reported an association following breast implants and reconstructive surgery [17]. However, to our knowledge and after literature search, this is the first report of M. Fortuitum cultured status post Breast Reconstructive surgery with tissue expander, not an implant and with no acellular dermal matrix utilized.

Conclusion

This case presents a typical presentation of Red Breast Syndrome after undergoing breast reconstructive surgery. However it highlights the importance of the ability for M. Fortuitum to grow in the presence of a tissue expander without the utilization of human derived acellular matrix. This case is another reminder of the importance of recognizing nontuberculous mycobacteria infections and the virulence of such resistant organisms.

Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy can be made available for review by the Editor-in-chief of this journal.

References

1. http://www.plasticsurgery.org/news/plastic-surgery-statistics
2. Becker Hilton, Jeffrey G. Lind, Elizabeth G. Hopkins II. Immediate Implant-based Prepectoral Breast Reconstruction Using a Vertical Incision. Plastic and Reconstructive Surgery Global Open. 2015; 3: e412.
3. Breuing KH, Warren SM. Immediate bilateral breast reconstruction with implants and inferolateral AlloDerm slings. Ann Plast Surg. 2005; 55: 232-239.
4. Salzberg CA. Nonexpansive immediate breast reconstruction using human acellular tissue matrix graft (AlloDerm). Ann Plast Surg. 2006; 57: 1-5.
5. Spear SL, Parikh PM, Reisin E, et al. Acellular dermis-assisted breast reconstruction. Aesthetic Plast Surg. 2008; 32: 418-425.
6. Bindingnavele V, Gaon M, Ota KS, et al. Use of acellular cadaveric dermis and tissue expansion in postmastectomy breast reconstruction. J Plast Reconstr Aesthet Surg. 2007; 60: 1214-1218.
7. Cicilioni Jr, Orlando J, Barry Sieger Van Brandon Foles, et al. Mycobacterium fortuitum Infection following reconstructive breast surgery: differentiation from classically described red breast syndrome. Plastic and Reconstructive Surgery Global Open 2013; 1: e50.
8. Nahabedian, Maurice Y. AlloDerm performance in the setting of prosthetic breast surgery, infection, and irradiation." Plastic and reconstructive surgery. 2009; 124: 1743-1753.
9. Breuing, Karl H, Stephen M. Warren. Immediate bilateral breast reconstruction with implants and inferolateral AlloDerm slings. Annals of plastic surgery. 2005; 55: 232-239.
10. Rawlani, Vinay. Tissue expander breast reconstruction using prehydrated human acellular dermis. Annals of plastic surgery. 2011; 66: 593-597.
11. Griffith, David E, R. J. Wallace. Rapidly growing mycobacterial infections in HIV-negative patients. UpToDate Waltham, MA, 2013.
12. Falkinham, JO, III. The changing pattern of nontuberculous mycobacterial disease. Can. J. Infect. Dis. 2003; 14: 281-286.
13. Falkinham, JO, III. The epidemiology of infection by nontuberculous mycobacteria. Clin. Microbiol. Rev. 1996; 9: 177-215.
14. Falkinham, JO, III, Norton C D, Le Chevallier MW. Factors influencing numbers of Mycobacterium avium, Mycobacterium intracellulare, and other mycobacteria in drinking water distribution systems. Appl. Environ. Microbiol. 2001; 67: 1225-1231.
15. Schelonka RL, Ascher P, McMahon DP, et al. Catheter related sepsis caused by Mycobacterium avium complex. Pediatr. Infect. Dis. 1994; 13: 235-238.
16. Macadam, Sheina A. Nontuberculous mycobacterial breast implant infections. Plastic and reconstructive surgery. 2007; 119: 337-344.
17. Betal Dibendu, Fiona A MacNeill. Chronic breast abscess due to Mycobacterium fortuitum: a case report. Journal of medical case reports. 2011; 5: 188.