

Introduction

- Gemella morbillorum*, previously known as *Peptostreptococcus morbillorum*, is a gram-positive anaerobic bacteria that resides primarily in the oropharynx, female genital tract and the gastrointestinal tract.^{1,2}
- Chest wall infections due to *Gemella Morbillorum* are rare. *Gemella* has been cited to cause endocarditis, necrotizing soft tissue infections and osteomyelitis in immunocompromised patients.^{2, 3, 4}
- The incidence of *Gemella Morbillorum* causing soft tissue infections is unknown. There are minimal cases reported in the literature.
- There is no reported mortality data regarding *Gemella morbillorum* and soft tissue infections due to the low incidence rate of infection with *Gemella*.²
- Risk factors for *Gemella morbillorum* include poor oral hygiene, immunocompromised status, use of indwelling medical devices and chronic health conditions.^{2,3}
- Soft tissue infections due to *Gemella morbillorum* may present as a standard tissue infection with signs of erythema, purulent discharge and symptoms of pain and fever.^{2,3}
- Complications of infection due to *Gemella morbillorum* include abscess formation, necrotizing fasciitis, chronic wound infection and death.^{4,5}
- Post operative adjuvant chemo with Ado-trastuzumab (TDM-1) was recently expanded for HER2+ breast cancer and demonstrated a 50% reduction in recurrence of cancer and death.⁶
- Small radiation injuries can typically be treated via a pedicle flap.^{7,8,9}
- The purpose of this case presentation is to educate providers on chest wall radiation injuries, the proper work-up for this injury, and how to treat *Gemella morbillorum* effectively.

Case Description

History of Present Illness

Chief complaint: right chest wall cavitory wound

A 52 year old male with a past medical history of Down's syndrome, chronic hypotension and stage 3b malignant breast cancer presented to the emergency department with a right chest wall wound. He had previously undergone neo-adjuvant therapy with Pertuzumab, Trastuzumab and Paclitaxel, bilateral radical mastectomy with node dissection and post-op adjuvant TDM-1 followed by external beam radiation and Tamoxifen. The patient and his family noted the chest wall wound began after his radiation therapy for breast cancer. The patient was seen by the wound care team in the outpatient setting and was placed on doxycycline. At a previous appointment, the wound care team noticed an odor from the wound and advised the patient to go to the emergency department. The patient denied pain to the region, chest discomfort or breathing problems.

Past Medical History

- PMHx: chronic hypotension, Down's Syndrome, Stage 3b malignant breast cancer
- Surgical history: bilateral radical mastectomy with lymph node resection 11/2023
- Social history: no alcohol, tobacco or drug use, cared for by his sister and in a group home during the day
- Family history: breast cancer history in mother, maternal grandmother and maternal cousin
- Medications: doxycycline from wound care, Tamoxifen held by oncology team 07/24/24
- Allergies: none

Physical Exam in the Emergency Department

- Vitals: BP: 108/76 mmHg, HR: 74 bpm, T: 99.2 F, O2: 98% room air, RR: 16 breaths/min
- ROS: (-) fever, chills, chest pain, shortness of breath, dizziness, weight loss, diaphoresis, abdominal pain
- Physical exam: right 2.6 cm x 5.6 cm cavitory chest wall wound with thick yellow, odorous exudate. Erythema surrounding the border of the wound, increased from previously drawn line. Pain on palpation of the region. No chest wall step-offs.
 - Cardiac: S1/S2 clear to auscultation, no murmurs
 - Pulmonary: vesicular lung sounds in all regions, no wheezing present, no consolidations appreciated

Table 1: Diagnostic Tests

Date	Findings & Procedures	WBC	H+H
July 24	Wound culture positive for <i>Pseudomonas aeruginosa</i> , <i>Enterococcus faecalis</i> , <i>Gemella morbillorum</i> ; Blood cultures negative	6.4	11.1/33.7
July 25	CT scan of chest wall: involvement of pectoralis major and minor muscles; no osseous involvement	4.9	12.2/37.8
July 26	Punch biopsy of chest wall negative for metastasis Wound washout completed	5.8	11.1/33.6
July 27	Wound sutured together, covered with gauze, dressing changed daily	5.4	11.1/34

Differential diagnosis

Chest wall infection, metastasis of breast cancer, abscess to chest wall, necrotizing soft tissue infection

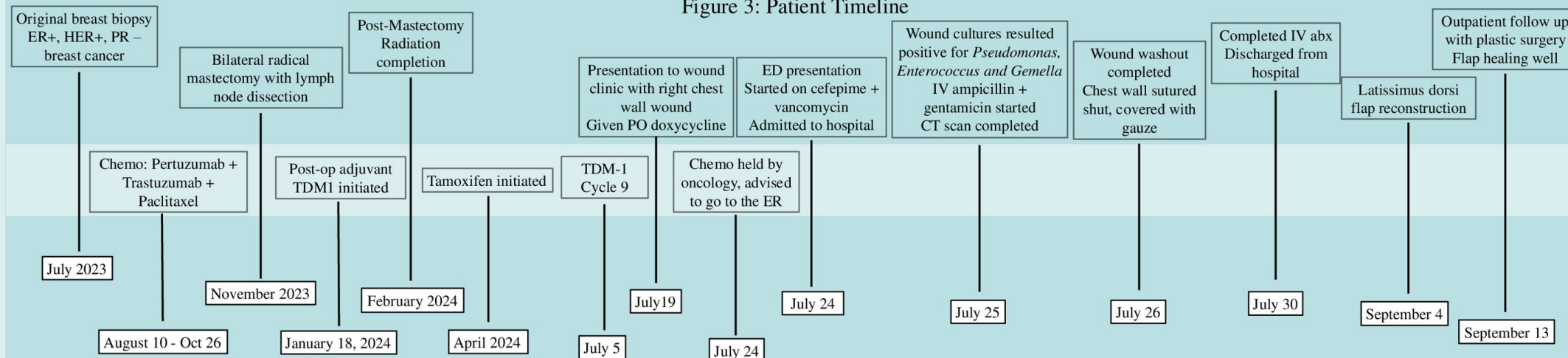


Figure 1: Right chest wound presentation in ED 7/24



Figure 2: Right chest s/p latissimus dorsi flap 9/13

Figure 3: Patient Timeline



Results

- Final diagnosis: Soft tissue infection of the chest wall and musculature confirmed by CT scan caused by *Gemella morbillorum*, *Pseudomonas aeruginosa* and *Enterococcus faecalis*
- Treatment course: empiric treatment with cefepime and vancomycin, converted to IV ampicillin and gentamicin once cultures resulted. Washout completed while in the hospital, punch biopsy obtained to rule out metastatic involvement. Once the patient was discharged on day six, they followed up with plastic surgery/breast surgery and decided to pursue a latissimus dorsi flap for the R chest wall wound.
- After the latissimus dorsi flap was completed surgically. The flap healed well without complications. Post op labs demonstrated no elevation in WBC count, no drop in H+H.
- The patient has continued to follow up outpatient with plastic surgery and wound care to track the healing of the flap. No metastatic disease has been detected.

Discussion

- Gemella morbillorum* should be considered in the differential for immunocompromised individuals or IV drug users who do not respond to standard antibiotic treatment for MRSA
- External beam radiation therapy can cause ulcers and abscesses which may develop into an infection. Early intervention is key to reducing the likelihood of a more serious, widespread infection.
- Doxycycline was the first antibiotic chosen by the wound to cover for MRSA, however, *Gemella* does not respond to doxycycline. Coverage must include a penicillin and an aminoglycoside.
- Obtaining a CT scan was vital for understanding the involvement of tissues around the chest wall. *Gemella* has been known to cause necrotizing soft tissue infections, so ruling this type of infection out is important.
- It is imperative to rule out recurrent cancer in a non-healing wound

Take Home Points

- Gemella Morbillorum* is a rare chest wall infection that can be treated with IV ampicillin and gentamicin
- Anaerobic infection such as *Gemella* should be considered in a patient that is not responding to empiric therapy designed to treat staph + strep
- A patient with a skin or soft tissue infection may have a normal white blood cell count. If WBC count is elevated, consider sepsis.
- Radiation injuries such as cavitory wounds are uncommon, however, patients should be consented for the risks, benefits and alternatives of radiation therapy
- Resolution of a radiation induced wound may only be possible through a flap reconstruction via plastic surgery

References

- Selçuk N, Esma C, Ruza SA, Selma A. Evaluation of Cases with Gemella Infection: Cross-Sectional Study. *Journal of Infectious Diseases and Epidemiology*. 2018;4(4). doi:10.23937/2474-3658/1510063
- Goldstein EJ, Merriam CV, Claros MC, Citron DM. Comparative susceptibility of *Gemella morbillorum* to 13 antimicrobial agents. *Anaerobe*. 2022;75:102573. doi:10.1016/j.anaerobe.2022.102573
- Bachmeyer C, Landgraf N, Dumas L. Soft tissue infection caused by *Gemella morbillorum* in two intravenous drug users. *J Am Acad Dermatol*. 2005;52(4):704-705. doi:10.1016/j.jaad.2004.11.045
- Romero-Velez G, Pereira X, Narula A, Kim PK. *Gemella morbillorum* as a source bacteria for necrotizing fasciitis of the torso. *BMJ Case Rep*. 2020;13(1):e231727. doi:10.1136/bcr-2019-231727
- Young Ann J, Kwon JC, Eun Song J, et al. Sternal osteomyelitis with a mediastinal abscess caused by *Gemella morbillorum* following blunt force trauma. *Intern Med*. 2013;52(4):511-514. doi:10.2169/internalmedicine.52.8958
- Manoussis EP, Ulich M, Mano MS, et al. Adjuvant T-DM1 versus trastuzumab in patients with residual invasive disease after neoadjuvant therapy for HER2-positive breast cancer: subgroup analyses from KATHERINE. *Ann Oncol*. 2021;32(9):1005-1014. doi:10.1016/j.annonc.2021.04.011
- Huang SC, Chen CY, Qu P, et al. Reconstruction of complex chest wall defects: A case report. *World J Clin Cases*. 2022;10(11):3505-3510. doi:10.12998/wjcc.v10.i11.3505
- Ma X, Jin Z, Li G, Yang W. Classification of chronic radiation-induced ulcers in the chest wall after surgery in breast cancers. *Radiat Oncol*. 2017;12(1):135. doi:10.1186/s13014-017-0876-y
- Sood R, Easow JM, Konopka G, Panthaki ZJ. Latissimus Dorsi Flap in Breast Reconstruction: Recent Innovations in the Workhorse Flap. *Cancer Control*. 2018;25(1):1073274817744638. doi:10.1177/1073274817744638