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CASE REPORT PEER REVIEWED | OPEN ACCESS

Suppurative parotitis in the setting of methicillin-resistant *Staphylococcus aureus* bacteremia

Matthew K McCabe, Shane Clark, Eric Williams, Gautam Kalyatanda

ABSTRACT

Introduction: Infection by methicillin-resistant *Staphylococcus aureus* is an uncommon and particularly severe cause of suppurative parotitis, an inflammatory disease marked by parotid gland swelling, erythema, tenderness, and purulent discharge. To date, fewer than two dozen cases of methicillin-resistant *S. aureus*-induced parotitis have been documented, although this is likely an emerging causal organism.

Case Report: We report the case of an elderly male presenting for unilateral facial swelling beginning shortly after receiving multiple dental fillings. His evaluation revealed leukocytosis, parotid gland enlargement and cellulitis on computed tomography, and cultures of blood and fluid expressed from the Stensen's duct that grew methicillin-resistant *S. aureus*. Despite treatment with intravenous vancomycin, the patient passed away from pneumonia less than three weeks after the onset of his symptoms.

Conclusion: Of the previously published cases that we identified, approximately one-quarter were bacteremic and a similar number were fatal. This report reviews the literature and describes the recommended treatment for cases of methicillin-resistant *S. aureus*-induced parotitis..

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INTRODUCTION

Parotitis, an infection of the parotid gland, can result from transient bacteremia or via the ascent of bacteria from the oral cavity through Stensen's duct [1]. It occurs most often in children younger than two months and in elderly patients with chronic diseases or recent surgeries, although it may arise at any age [1]. Other known risk factors include conditions that reduce secretory function, including dehydration, starvation, immunosuppression, and ductal obstruction [2]. Parotitis can be caused by several different viruses and bacteria, most commonly *Staphylococcus aureus* [2]. Methicillin-resistant *S. aureus* (MRSA) is particularly concerning because it can rapidly produce infectious complications and affect previously healthy individuals. Although MRSA is a much rarer cause of parotitis, it appears to be increasingly prevalent and thus a concerning cause of healthcare-associated and community-acquired parotitis [1]. Here, we describe the case of a patient who developed bacteremia following infection of the parotid gland by MRSA and review the literature on this uncommon cause of parotitis.

CASE REPORT

A 77-year-old male was admitted with a one-week history of worsening fatigue and swelling between his right ear and his jaw. His past medical history was significant for amyotrophic lateral sclerosis (ALS), Alzheimer's disease, benign prostatic hypertension, a prior deep vein thrombosis requiring an inferior vena cava filter placement, and a routine dental restoration involving multiple fillings for caries seven days before admission. He denied taking any antibiotics prior to or following this procedure. Because of his ALS, he was dependent on bi-level positive airway pressure (BiPAP) at home.

On admission, he appeared drowsy and cachectic and was found to be hypotensive, tachycardic, and febrile. A physical examination revealed edema, erythema, and induration extending from his right ear to the sternoclavicular junction on the right side, with no apparent tenderness to palpation. Initial laboratory results showed a white blood cell count (WBC) of 18.4×10^9 cells/L (normal: $4–11 \times 10^9$ cells/L) and a lactic acid of 2.9 mmol/L (normal: 0.3–1.5 mmol/L). Computed tomography (CT) imaging demonstrated cellulitis throughout the right side of his face and extending into the submandibular space, right parotid gland enlargement, and no evidence of fluid collection (Figure 1).

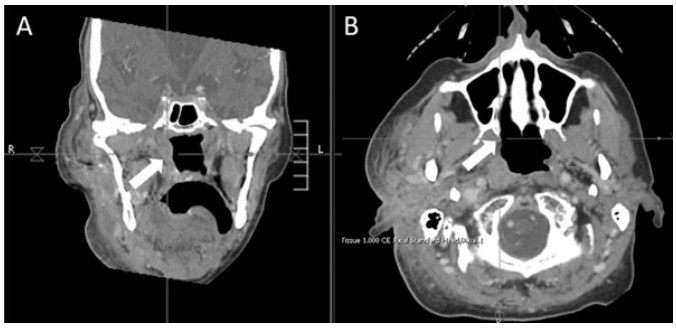

Figure 1: Maxillofacial computed tomography scan in coronal (A) and transverse (B) views demonstrating right parotid gland enlargement (white arrows) without fluid collection.

Empiric vancomycin and cefepime were commenced after obtaining blood cultures. Purulent fluid expressed from the right Stensen's duct the following day was also cultured. Both swab and blood cultures grew MRSA in two out of four bottles. Vancomycin was continued but cefepime was discontinued. A transthoracic echocardiogram showed atypical echo density in the left atrium, which could not be well characterized. His WBC began to downtrend and repeat blood cultures two days after antibiotics were started had no growth. However, on day nine of his hospital stay, he developed pneumonia and his condition worsened, after which piperacillin-tazobactam was started and vancomycin was continued. With his condition worsening, his family decided to transition him to comfort care and all antibiotics were stopped. The patient passed away 11 days after admission.

DISCUSSION

Parotitis in adults may be caused by viruses or bacteria. Suppurative parotitis, a bacterial infection of the parotid gland, is most commonly caused by *S. aureus* and may be distinguished from a viral infection by its unilaterality, sudden onset of erythematous swelling, and purulent drainage from Stensen's duct [1]. Our patient had many of the risk factors of suppurative parotitis, including advanced age, multiple chronic diseases, and a recent dental restoration, and exhibited symptoms typical of the disease, though the causative organism was unusual. Although MRSA and parotitis caused by other bacteria and viruses share many of the same risk factors, and these factors are frequently seen in hospitalized patients, the incidence of MRSA-induced parotitis is rare in the literature. Fewer than two dozen cases have been published since the first reported incidence of MRSA parotitis in 1990 [3–19]. The risk factors, clinical presentations, and outcomes of the published cases of MRSA parotitis are listed in Table 1.

Bacteremia is a rare complication of MRSA parotitis. A review of the literature shows that of the 22 previously reported cases of MRSA parotitis, only six were associated with bacteremia. These cases were exclusively in elderly female patients, with an average age of greater than 85 years. Bacteremia due to MRSA is associated with significant morbidity and mortality, particularly in patients who develop infective endocarditis, which may have occurred in this patient [20].

Since the first outbreaks in the 1960s, MRSA has become endemic to healthcare settings. A review of these published cases suggests that MRSA is an increasingly prevalent infectious cause of parotitis in at-risk populations. Of the 22 previous reports of MRSA parotitis, only four patients had any known prior exposure to MRSA. The ultimate cause of MRSA parotitis in this patient is unknown. A potential source of infection may have been his dental restoration performed two weeks prior. Post-procedural salivary gland inflammation is a rare clinical entity, described by Yonkers et al. in 11 cases over a 23-year period in 1972 [21]. This report indicates that incidents of post-procedural parotitis typically occur in patients with poor dental hygiene, begin within two weeks of the procedure, and likely result from the ascent of *S. aureus* through Stensen's ducts.

Suppurative parotitis is typically treated with antibiotics but may require surgical drainage in the event of abscess formation [1]. Empiric antimicrobial regimens for parotitis often consist of intravenous ampicillin/sulbactam or clindamycin, yet a review of the literature indicates that patients started early on vancomycin have better outcomes [1]. The addition of intravenous vancomycin to empiric treatments of parotitis in hospitalized patients may therefore be indicated while awaiting culture sensitivities, particularly for patients with underlying diseases, such our patient's ALS.

Table 1: Published cases of suppurative parotitis due to methicillin-resistant *Staphylococcus aureus* infection

Age/Sex	Risk factors	Clinical presentation	Treatment	Outcome	Study
77/M	ALS, dementia, poor dentition	Bacteremia, neck swelling, WBC 18.4	Cefepime, vancomycin	Died day 11	
49/F	T2DM	Nuchal rigidity, tachycardia, tenderness, WBC 15.7	Vancomycin, Zosyn	Lost to follow-up	3
13/M	NR	Parotid swelling, spinal pain, trouble urinating	Bactrim	Died before admission	4
79/F	Pancreatic cancer, pancreatico-duodenectomy	Bacteremia, fever, parotid swelling	Tazocin, teicoplanin	Survived	5
93/F	CAD, dementia, nursing home	Parotid swelling	Linezolid	Died at 3 weeks	6
17 day/M	NR	Fever, parotid swelling, WBC 18.6	Vancomycin	Survived	7
37 day/M	Maternal MRSA mastitis	Fever, parotid swelling, WBC 19.3	Cefotaxime, clincamycin, vancomycin	Survived	7
21 day/M	PPROM	Fever, parotid swelling, WBC 18.6	Cefotaxime, clindamycin, vancomycin	Survived	8
28 day/F	PPROM	Fever, parotid swelling	Cefotaxime, clindamycin, vancomycin	Survived	8
22/F	Recent international travel	Parotid swelling, neutrophilia	Clindamycin	Facial palsy, survived	9
12 day/M	NR	Parotid swelling	Bactrim	Survived	10
75/F	NR	Altered mentation, fever, parotid swelling	Vancomycin, Zosyn	NR	11
56/M	Prior MRSA, tongue cancer, radiation/ chemotherapy	Fever, parotid swelling, WBC 29.4	Bactrim, vancomycin	Survived	12
88/F	Myeloproliferative disorder, T2DM	Bacteremia, fever, parotid swelling, WBC 28.1	Floxacillin, vancomycin	Died at 7 weeks	13
73/F	Dementia, nursing home, prior MRSA, T2DM	Bacteremia, fever, parotid swelling, WBC 31.6	Vancomycin	Survived	13
79/M	CVA, dehydrated, poor dentition	Fever, parotid swelling, WBC 15.6	Cefazolin, vancomycin	NR	14
73/M	NR	Fever, parotid swelling, WBC 24.0	Vancomycin	NR	14
97/F	Dementia, nursing home	Bacteremia, fever, parotid swelling, WBC 31.0	Vancomycin	Survived	15
91/F	Dementia, nursing home	Bacteremia, parotid swelling, WBC 29.0	Vancomycin	Survived	15
58/F	Prior MRSA, prior hospitalizations	Parotid swelling	Vancomycin, linezolid	Survived	16
85/F	CHF, T2DM	Bacteremia, fever, parotid swelling, tenderness, WBC 36.8	Cefazolin, vancomycin	Survived	17
72/M	Dehydration, pancreatitis, poor dentition	Hyperpyrexia, parotid swelling, trismus, WBC 20.0	Teicoplanin	Facial palsy, died day 12	18
85/M	CAD, CVA, dehydration	Fever, parotid swelling, WBC 13.0	Nafcillin	Died day 1	19

ALS, amyotrophic lateral sclerosis; CAD, coronary artery disease; CHF, congestive heart failure; CT, computed tomography; CVA, cerebrovascular accident; MRSA, methicillin-resistant *S. aureus*; NR, not reported; PPROM, preterm premature rupture of membranes; T2DM, Type II diabetes mellitus; WBC, white blood cells (in 1×10^9 cells/L)

CONCLUSION

The potential of MRSA to causes severe infections and serious complications, combined with its growing prevalence, makes it an important clinical consideration in cases of suppurative parotitis with unknown etiology. A review of the literature demonstrates that MRSA infections of the parotid gland often occur without any previous known exposure to MRSA or common risk factor. This case supports the early use of intravenous vancomycin for treatment of parotitis in hospitalized patients awaiting culture sensitivities, but underscores the severity of this infection and the challenges of its management in patients with complex medical histories.

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Matthew K McCabe – Conception of the work, Design of the work, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Shane Clark – Acquisition of data, Analysis of data, Interpretation of data, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

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