



Acute Bacterial Parotitis with Severe Sepsis in a Patient with Congestive Heart Failure: Report of a Case and Review of the Literature

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Acute bacterial parotitis (ABP) is an uncommon infection of the parotid gland that tends to occur in immunocompromised patients. The most predominant pathogen causing ABP is *Staphylococcus aureus*.^{1,2,3} We report a case of a patient with valvular heart disease and dilated cardiomyopathy accompanied by congestive heart failure (NYHA, Fc IV). During hospitalization, the cardiac preload of patients is reduced by restricting their fluid intake and administering appropriate diuretic therapy. Unfortunately, our patient developed nosocomial pneumonia and ABP with methicillin-resistant *Staphylococcus aureus* (MRSA) infection and subsequent bacteremia with sepsis. Herein, we emphasize that the maintenance of good oral hygiene, adequate dehydration, and proper antimicrobial therapy in the event of concurrent infection may reduce the occurrence of ABP in patients with excessive dehydration due to severe heart failure.

Key words: acute bacterial parotitis, heart transplantation, heart failure, excessive dehydration

INTRODUCTION

Poor oral hygiene, long-term debility, and reduced production and flow of saliva are common features of patients with acute bacterial parotitis (ABP).^{2,4,5,6} It is necessary to control excessive fluid production in patients with congestive heart failure who are on large-dose diuretic therapy. We present a case of ABP with excessive dehydration and coinfection with methicillin-resistant *Staphylococcus aureus* (MRSA). In the initial stages of the clinical course, the patient developed ABP and septicemia, which lead to prolonged hospitalization and delayed heart transplantation.

CASE REPORT

A 56-year-old man was referred by a regional hospital with dilated cardiomyopathy (DCM) accompanied by

severe mitral valve regurgitation (MR) and aortic valve regurgitation (AR). He had CHF (NYHA, Fc IV) since 1 year, and was on the waiting list to undergo heart transplantation. During hospitalization, diuretic therapy and limited fluid intake were manipulated to reduce the cardiac preload and to prevent pulmonary edema. Because there were no donors for heart transplantation, aortic valve replacement (AVR) and mitral valve replacement (MVR) were performed to avoid the exacerbation of heart failure. Tracheostomy was performed since the patient could not be weaned from ventilatory support.

One month after tracheostomy, the patient developed productive cough with spike fever of 39.2 °C, and X-ray examination of the chest showed infiltration over bilateral lower lobes. On the same day, progressive swelling of the right side of the upper neck was observed, and a firm, tender, and well-defined mass was palpable. The patient was dehydrated due to diuretic therapy and limited fluid intake. Decreased urine output and dry skin turgor were observed. Laboratory values revealed a white blood cell count of 28800/ μ l and high C-reactive protein levels of 43.04 mg/dL. A computed tomographic scan of the neck after injection with intravenous contrast medium showed an enhanced mass of approximately 4.93 cm $\times$ 3.37 cm in size within the right parotid gland and no evidence of deep neck infection. Subsequent pathological examination of the sputum and blood samples revealed the presence of MRSA. MRSA culture was performed

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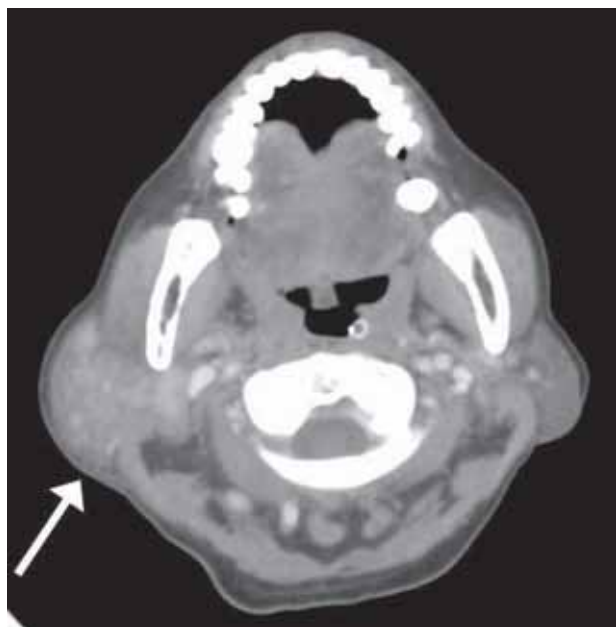


Fig. 1 The right parotid gland shows diffuse enlargement with slight increase in parenchyma enhancement (the arrow) as compared to the left normal-sized parotid.

using samples obtained by fine-needle aspiration and from infected tissue specimens. Adequate hydration and administration of parenteral antimicrobials, including vancomycin and ertapenem, was performed. After 2 weeks of antibiotic treatment with intravenous vancomycin injection, ABP-associated MRSA infection and nosocomial pneumonia were completely resolved as indicated by MRSA-negative blood and sputum culture. Further, laboratory values revealed a white blood cell count of $7600/\mu\text{l}$ and C-reactive protein level of 0.4 mg/dL . After 2 weeks, the patient underwent heart transplantation, and subsequently, he was discharged in a stable condition in the next 2 weeks.

DISCUSSION

Parotid infection is the most common form of salivary gland infection, and *Staphylococcus aureus* is the most common pathogen observed in the nosocomial cases.^{1,2,3} ABP, characterized by the sudden onset of a unilateral and tender swelling on the face or neck, probably originates from a septic focus in the oral cavity or respiratory tract; similar findings were observed in our case. ABP is commonly observed in debilitated patients who develop systematic illness on account of recent surgery, immunosuppression, advanced age, and chemotherapy,



Fig. 2 The size of the right parotid is measured 4.93 cm in anterior-posterior diameter and 3.37 cm in width on axial plane (the arrow). The normal left parotid is about $3.78 \times 2.8\text{ cm}^2$.

which could be life-threatening (mortality rate, more than 50%).^{4,7,8,9} The main risk factor is decreased salivation, which is a predisposition to the overgrowth of bacteria.⁴ Moreover, ABP can result from other conditions such as Sjogren's syndrome, diabetes mellitus, hepatic failure, renal failure, hypothyroidism, Cushing's disease, and due to dehydration caused by the anticholinergic and diuretic effects of medications such as antihypertensives, antihistamines, and antidepressants.¹⁰ Numerous factors are associated with salivary stasis and increased risk of acute suppurative infection of the salivary gland. Systemic dehydration is the main classic cause of salivary stasis in postoperative patients or those who have undergone medical therapy including diuretics and are on limited fluid intake.⁵ In 78% of the cases, the fundamental treatment was antibiotic therapy without drainage. The antibiotic treatment should be started immediately after diagnosis, and surgical drainage should be performed only if obvious clinical improvement is not observed within 48h.^{11,12,13,14,15}

In our case, the patient had valvular heart disease and dilated cardiomyopathy with CHF accompanied by MRSA nosocomial pneumonia. Therefore, we highly suspected that ABP resulted from MRSA pneumonia that was caused by either spreading of the sputum in the lower respiratory tract due to inappropriate suction or by

the normal flora in the oral cavity. The colonization of MRSA via Stensen's duct might occur due to poor oral hygiene and decreased production and flow of saliva from the parotid gland.^{5,6} In patients with CHF, diuretic administration was the standard treatment to decrease the cardiac preload. However, excessive dehydration was associated with increased incidence of ABP. Eventually, the patient underwent heart transplantation and no recurrent ABP was observed when the patient was in an immunocompromised state during the late clinical course. The findings of our case highlight the importance of ABP as a potential life-threatening complication in patients who are administered large-dose diuretic therapy, especially those with severe CHF. Our patient recovered successfully after 2 full- courses of vancomycin therapy, and he underwent heart transplantation 2 weeks later. It is important that, oral hygiene, even regular gargling, be emphasized in intensive care units. Moreover, washing hands after examining patients and using different suction tubes for both lower respiratory tract and oral cavity can avoid iatrogenic MRSA infection.

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