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CASE REPORT

Facial Abscess due to *Staphylococcus aureus* in a 64-year-old Male Patient with Type 2 Diabetes Mellitus

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ABSTRACT

Diabetes mellitus (DM) is a chronic disease with an increasing frequency over the last decade. DM patient has higher risk of infection than people without diabetes. Several literatures suggest a strong positive correlation between hyperglycemia and skin infections. Skin and soft tissue infections (SSTIs), including abscess which commonly caused by *Staphylococcus aureus*, could lead to severe and life-threatening infections. The correct diagnosis and effective management therapy should be needed to prevent further complications and reduce morbidity and mortality. We report a case about facial abscess caused by *S. aureus* in diabetic patient that healed after got incision drainage and antibiotics.

Introduction

It is estimated that over 284 millions adults were living with diabetes mellitus (DM) worldwide in 2010, and this number is expected to increase by 54% by 2030. In Indonesia, the International Diabetes Federation (IDF) predicts that people with diabetes becomes 16.7 million by 2045. Skin and soft tissue infections (SSTIs) is one of the most frequent infections worldwide. The prevalence of this disease rises with increasing age, trauma and comorbidities such as diabetes mellitus, obesity and peripheral vascular disease.^{1,2,3}

Epidemiological studies evaluating occurrence of skin disorder in DM varied from 51.1 to 97%. The most common disorder reported was infection occurring in at least 20.6% of diagnosed DM patients.^{4,5} Research from Denmark finds that people with diabetes have three times greater risk than non-diabetics of developing severe infection caused by *Staphylococcus aureus* bacteria. Diagnosis and optimal treatment should be needed to prevent the further

complication of skin infection caused by *S. aureus*.⁶ We report a case about facial abscess caused by *S. aureus* in diabetic patient, the diagnosis and management.

Case

A 64 years old male patient, came to the ER with facial swelling. He got the first symptom about 2 weeks before. Single pimple, about 0.5 cm, appeared on the upper left side of his nose, felt itchy and painful. He scratched and squeezed the pimple with fingers. Three days later, pimple pooped out and released pus and blood, skin around it flushed, swelled and felt warm. The swelling had been increasing in size and spreading out to both cheeks and eyes, the pain also had been getting worst day by day. He had fever, fatigue, and appetite loss since 5 days before admission. He took paracetamol and put baby oil on the skin to relief pain. Then he visited local hospital, where he was diagnosed with sepsis due to facial abscess. Since there was no improvement in his condition, he was referred



to our hospital for further management. He was a diabetic patient for 2 years and took metformin irregularly and diagnosed with cerebrovascular attack 6 month ago.

On examination, he was conscious and oriented, heart rate 110 beats/minute regular, blood pressure 100/70 mmHg, respiratory rate 20/minute with 96% oxygen saturation in room air, axil temperature 38°C, and pain scale 6-7. He was overweight with 85 kg and 165 cm tall. Local examination revealed swelling of the entire central face (cheeks, nose and eyes), dark red, tender and warm. There was fluctuating surface on the left side of the nose. Other systemic examinations were normal.

Initial laboratory examination showed WBC 20,900/ μ L, neutrophil 84%, lymphocyte 8.1%, random blood glucose 125 mg/dL, BUN 21 mg/dL, creatinin serum 1.89 mg/dL, Albumin 2.23 g/dL, others were within normal limit. Chest X-ray showed heart and lungs were normal. Panoramic x-ray showed no soft tissue mass or swelling. Based on the data, he was diagnosed with Facial abscess, acute kidney injury, hypoalbuminemia and type 2 Diabetes Mellitus. We consulted him to Otorhinolaryngologist related to abscess incision and drainage. He was given 2100 kcal/day B1 diet (20% protein, 20% fat, 60% carbo), 1000-1500 ml crystalloid fluid/day, Ceftriaxon 1000mg/12 hours iv, Metronidazole 500mg/8 hours iv, paracetamol 500mg/8 hours per oral, albumin 20% infusion, and rapid acting insulin 6 unit subcutan before meal, long acting insulin 10 unit subcutan once daily.

On 2nd day, he still had fever but pain score decreased to 4-5. Laboratory results showed HbA1C 11.0%, FPG 102 mg/dL, PPPG 185 mg/dL so previous treatment continued. On 3th day, he got incision and drainage for the abscess, about 3 ml pus and blood was collected and sent to microbiology department for culture and sensitivity test. On 6th day, facial skin improved, pain decreased and no more pus produced. Vital sign was stable and laboratory result showed leukocyte counts decreased (13.360/ μ L) with neutrophil 76.5% and lymphocyte 13.9%, albumin serum increased 2.7 g/dL, creatinin 1.4 mg/dL. Blood culture test showed no pathogen. Superficial and deep pus culture test showed *Staphylococcus aureus* bacteria and sensitive to Cotrimoxazol, Clindamycin, Levofloxacin and Moxifloxacin and resistance to Ampicilin and Tetracyclin. We changed antibiotic to Cotrimoxazole 480mg peroral twice daily. On 8th day, he was discharged, antibiotic continued for next 5 days. The clinical improvement show on Figure 1.



Figure 1. Clinical improvement on day 1-3-8

Discussion

Hyperglycemia promotes advanced glycation end-product (AGE) formation and affects skin homeostasis by inhibiting keratinocyte proliferation and migration that can induce direct damage and ulceration which provides a route of entry for bacteria. Poor hygiene also contributes to skin infection in diabetic patient.^{5,7} In this case, based on his age, overweight, uncontrolled diabetes condition and lack of hygiene, the patient has high risk to develop SSTIs.

Cutaneous abscesses is one of SSTIs which forms as result of tissue damage caused by granulocytes and bacterial enzymes, clinically characterized by fluctuating, dark red, painful, warm mass and usually under an intact epidermis. Infection usually occurs through inoculation after injury, occasionally supported or facilitated by scratching, manipulation or occlusion, but may also develop by hematogenous dissemination. Abscess are generally caused by bacteria and the most common is *S. aureus*.^{1,6,7} In this case, the patient noticed a pimple came out on the right side of his nose. He scratch and sometime squeezed it. It got infected then became cutaneous abscess.

S. aureus colonies found on the anterior nares approximately 30% of healthy, asymptomatic adults. On the other hand, *S. aureus* SSTIs (SA-SSTIs) could affect patients of all ages and manifest in diverse array of clinical presentations, varying from superficial and harmless, to severe and life-threatening. *S. aureus* can access to deeper tissue and disseminate into the bloodstream causing invasive disease such as endocarditis, osteomyelitis, deep tissue abscesses, pneumonia and sepsis. The emergence of multidrug-resistant *S. aureus* (MRSA) strains limits antimicrobial therapies lead to increase in morbidity and mortality.^{6,8}

Adequate incision and drainage followed by sufficient surgical care is the first effective therapy for abscess. Abscesses mostly are difficult to access by antibiotics. There are specific indications for antibiotic use, in addition to incision and drainage, which are if location is on the face, hands, and genitoanal area, difficulty in sufficient drainage, immunodeficiency, recurring abscesses and diffuse expansion into soft tissues (cellulitis).¹ Culture and sensitivity test is indicated for moderate and severe purulent SSTIs. Empiric antibiotic such as Trimethoprim-Sulfamethoxazole or Doxycycline is recommended for moderate purulent SSTIs and Vancomycin or Daptomycin for severe purulent SSTIs.^{9,10}

In this case, the location of abscesses is on the face area and there was systemic signs of infection such as fever, increase heart rate, fatigue and increased leukocyte count (neutrophil dominant) so it classified to moderate purulent SSTIs. We did incision and drainage for the abscesses and continued with pus culture and sensitivity test to identify the microbe and determine the antibiotic. Three days later, the pus culture positive for *S. aureus*, so we change the antibiotic with oral Cotrimoxazole for 5 days to prevent the recurrence, which is sensitive to the pathogen based on the sensitivity result.

Conclusion

Cutaneous abscess, even a mild infection, need a careful management especially in diabetic patient. Optimal treatment must be needed soon after the diagnosis⁷ is made, to prevent further complication of purulent skin and soft tissue infection. Incision and drainage followed by sufficient surgical care is the first effective therapy.

Conflict of Interest

The author stated there is no conflict of interest

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