

PAROTID ABSCESS WITH FACIAL PALSY IN A PATIENT ON HEMODIALYSIS: A MANAGEMENT CHALLENGE

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ABSTRACT

A parotid abscess is a rare condition often associated with immunocompromised status. ESRD is known to increase the risk of infections (DNI), two-fold. Parotid abscess in patients with ESRD may behave aggressively with extension into adjacent spaces and facial paralysis. Management of infections in patients with ESRD is challenging and often dictates a modification of the usual treatment strategies because of alterations in their protein binding, volumes of distribution, kidney clearance, and non-renal clearance. Facial palsy associated with parotid abscess is rare with only a few reports in the literature. The exact etiology and mechanism of this palsy are unknown however compression of the nerve is the most suspected cause. Although corticosteroids and physiotherapy are proposed treatment modalities for faster recovery of nerve function, there are no clear guidelines for the same. Here, we report a case of a patient with parotid abscess and facial paralysis, with underlying ESRD and uncontrolled diabetes, on dialysis for the past 15 years. Incision and drainage were performed under local anesthesia due to the patient's high-risk status. Suitable antibiotic therapy was administered after confirming the renal safety of the doses. Four weeks post-presentation, the patient was asymptomatic with partial recovery of the paralysis.

Key words: Kidney failure-chronic, Facial palsy, Soft tissue abscess, End-stage renal disease, Parotid abscess.

Introduction

A parotid abscess is a rare condition often associated with immunocompromised status [1, 2]. Patients with end-stage renal disease (ESRD) may have an increased tendency to develop a parotid abscess due to altered salivary flow, dehydration especially in the presence of poor oral hygiene. Facial palsy is usually associated with a malignant parotid neoplasm and is uncommon in association with a parotid abscess with only a few reports in the literature [3, 4]. The exact etiology and mechanism of this palsy are unknown however perineuritis and compression of the nerve is the most suspected probability [5].

Infections are a leading cause of mortality in patients on hemodialysis for ESRD [6]. Patients with ESRD may have alterations in their protein binding, volumes of distribution, kidney clearance, and non-renal clearance, which necessitates pharmacological dose adjustments to prevent toxicity [7-9]. Restricted drug doses, in turn, compromise the antimicrobial therapy deemed necessary to treat the infection [10]. Increased anesthetic risk, the requirement of fluid restrictions and ongoing renal dialysis makes management of these patients challenging, often dictating a modification of the usual treatment strategies [11].

We present a case on the management of parotid abscess with facial palsy in a patient with end-stage renal disease.

Case report

History and examination

An 84-year-old female reported to our department with the chief complaint of swelling and pain on the left cheek for the past 1 month. She was a known case of stage 5 chronic kidney disease (CKD) on dialysis, thrice-weekly, and uncontrolled type 2 diabetes mellitus for the past 15 years. The patient presented with bilateral pedal oedema reported nil urine output; and was irritable and weak. Local examination revealed a diffuse swelling approximately 11 x 6.5 cm in size on the left side of the face, elevating the ear lobule and extending superiorly up to the left infraorbital region and inferiorly up to the middle of sternocleidomastoid, anteriorly up to the midline of the face, posteriorly up to the pre-auricular region (**Figure 1a and 1b**). The swelling crossed the midline on the neck. On palpation, the swelling was warm, tender, and indurated. The mouth opening was restricted. Additionally, the patient displayed an inability to completely close the left eyelid and an absence of wrinkling on the left half of the forehead which had initiated after the onset of the swelling.

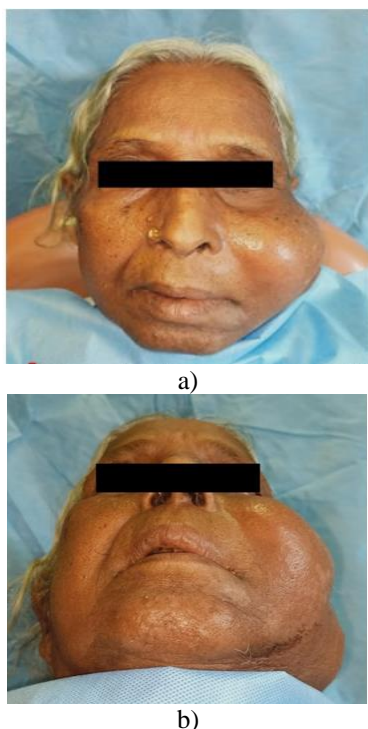


Figure 1. a) Patient Exhibiting Swelling in the Left Side of Face. **b)** Swelling Seen in Preauricular, Submandibular, and Submental Region

Imaging

Computed Tomography (CT) of the head and neck performed 2 days before presentation revealed, heterodensity in the left superficial lobe of the parotid gland, giving an impression of a possible parotid pathology (**Figure 2**). Ultrasound (USG) of the left cheek was done to delineate and confirm CT findings. USG reported a residual collection primarily in the parotid space extending to submasseteric space.

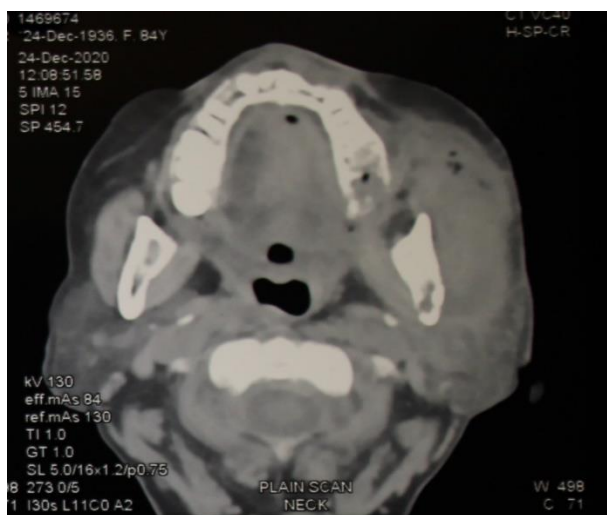


Figure 2. Computed Tomography Scan, (Axial Section) Showing Thickened Left Masseter Muscle and an Underlying Area of Decreased Density Representing Abscess Formation

Management

The swelling was progressing fast and may have caused an airway compromise if not attended to immediately. Given the high risk for general anesthesia and the ongoing coronavirus pandemic, the patient and the care providers were unwilling for hospital admission and general anesthesia. The patient was thus taken up for emergency incision and drainage under local anesthesia. Under aseptic precautions and local anesthesia, an extraoral incision was placed in the skin over the posterior aspect of the cheek in the dependent region and intraorally at the external oblique region. Vital parameters of the patient were monitored, throughout the procedure. About 50 ml of pus was evacuated and culture swab and pus aspirate were sent for microbial culture and antibiotic sensitivity tests. The swelling was seen to collapse considerably and an extraoral corrugated rubber drain was placed (**Figure 3a and 3b**).

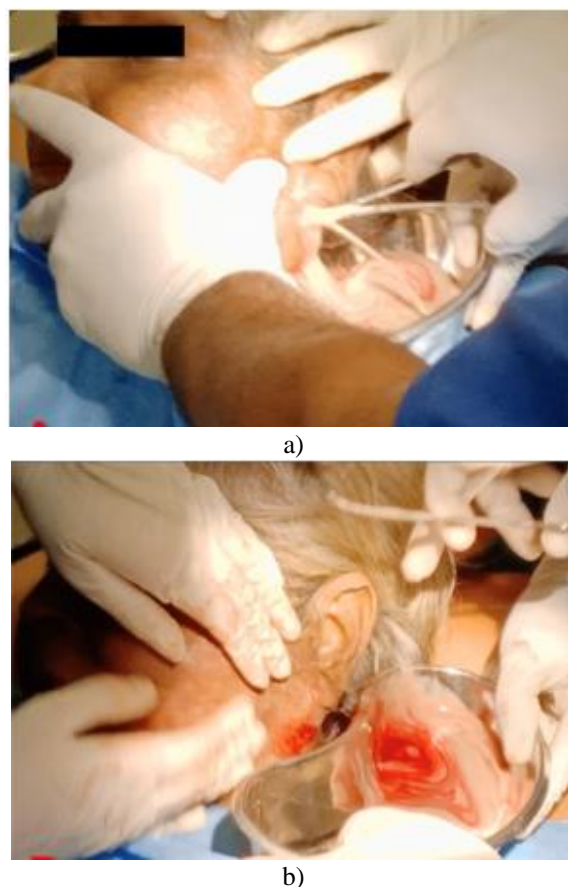


Figure 3. a) Extraoral Incision and Drainage of Submasseteric Abscess Performed. **b)** Collection of Pus

The patient was started on empirical antibiotic therapy of Amoxicillin and Clavulanic Acid 625 mg, 12 hourly. Pus culture revealed *Klebsiella pneumonia*, susceptible to Cefoperazone and Sulbactam combination. Its usual adult dose of 2 grams 12 hourly was modified to 1.5 g intravenously 12 hourly, for 7 days as per nephrologist opinion. The patient was reviewed in the outpatient department on consecutive days and regular drainage was done. Four weeks post-presentation, the patient was

asymptomatic with no swelling and pus discharge (**Figure 4**).



Figure 4. Complete Resolution of the Swelling Seen at 1 Month Followup

Rapid partial recovery of the paralysis was seen within 10 days after the surgical drainage. The patient continued with dialysis throughout the treatment of the abscess. Informed consent of the patient was taken for publishing the report.

Results and Discussion

Immunocompromised status is a known risk factor for parotid abscess. Reduced salivary flow rate and alteration in salivary gland metabolism may predispose an individual to salivary gland infection. Also, CKD patients are often prone to retrograde parotitis, which is believed to result from a combination of direct gland involvement, chemical inflammation, side effects of drug therapy, dehydration, and mouth breathing.

ESRD is a predisposing factor for head and neck infection, causing a potential immunocompromise in the patient [12]. Palmer *et al.* in their multicenter cohort study of 4205 renal dialysis patients with ESRD concluded that poor oral health in these patients is associated with early mortality [13]. A variety of factors has been recognized to increase the susceptibility of ESRD patients to infections. Decreased T cell activity, impaired phagocytosis, and reduced antibody production are some of the factors responsible to make ESRD patients more susceptible to infections [14, 15]. In the present case, both diabetes and ESRD were managed optimally along with treatment parotid abscess to aid in faster resolution of the condition.

Facial paralysis in the parotid abscess is suspected to be due to ischemic neuropathy arising from the local toxic effects of infection and the compression of the nerve due to the

expanding abscess, as was seen in the current case. Although corticosteroids and physiotherapy have been utilized as proposed treatment modalities for faster recovery of nerve function [16], there are no clear guidelines for the same. Moreover, many authors have proposed relieving nerve compression by drainage of abscesses and observation to be satisfactory for recovery of the nerve function [17, 18]. Because of the ESRD and diabetic status of the patient, corticosteroids were avoided and the patient was followed up to ensure recovery of nerve function.

Conclusion

ESRD is associated with an increased rate of infections and related mortality. Parotid abscess in patients with ESRD may behave aggressively with extension into adjacent spaces and facial paralysis. The condition demands prompt treatment but with judicious use of drug therapy. The recovery may often be slow demanding continuous care with a close follow-up of the patient.

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Written informed consent was obtained from the patient for publication of this case study, as well as accompanying images.

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References

1. Tan VES, Goh BS. Parotid abscess: a five-year review-clinical presentation, diagnosis and management. *J Laryngol Otol.* 2007;121(9):872-9.
2. Kim YY, Lee DH, Yoon TM, Lee JK, Lim SC. Parotid abscess at a single institute in Korea. *Medicine (Baltimore).* 2018;97(30):e11700.
3. Bobbitt TD, Subach PF, Giordano LS, Carmony BR. Partial facial nerve paralysis resulting from an infected mandibular third molar. *J Oral Maxillofac Surg Off J Am Assoc Oral Maxillofac Surg.* 2000;58(6):682-5.
4. Gray RL. Peripheral facial nerve paralysis of dental origin. *Br J Oral Surg.* 1978;16(2):143-50.
5. Zandian A, Osiro S, Hudson R, Ali IM, Matusz P, Tubbs SR, et al. The neurologist's dilemma: A comprehensive clinical review of Bell's palsy, with emphasis on current management trends. *Med Sci Monit Int Med J Exp Clin Res.* 2014;20:83-90.
6. Infections in hemodialysis: a concise review - Part 1: bacteremia and respiratory infections [Internet]. [cited

- 2021 May 20]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3093138/>
7. Eyler RF, Shvets K. Clinical Pharmacology of Antibiotics. *Clin J Am Soc Nephrol CJASN*. 2019;14(7):1080-90.
 8. Syed Sulaiman SA, Tariq MH. Evaluation of pharmacist's knowledge regarding chronic kidney disease. *Arch Pharm Pract*. 2020;11(4):1-8.
 9. AlMoula AH, Azeez AA, Abass KS. Assessment of legalon on kidney functions and Lipids profile in broiler chickens exposed to Hydrogen Peroxide. *J Adv Pharm Edu Res*. 2020;10(4):79-86.
 10. Leekha S, Terrell CL, Edson RS. General Principles of Antimicrobial Therapy. *Mayo Clin Proc*. 2011;86(2):156-67.
 11. Wagener G, Brentjens TE. Anesthetic concerns in patients presenting with renal failure. *Anesthesiol Clin*. 2010;28(1):39-54.
 12. Kappel J, Calissi P. Nephrology: 3. Safe drug prescribing for patients with renal insufficiency. *CMAJ*. 2002;166(4):473-7.
 13. Palmer SC, Ruospo M, Wong G, Craig JC, Petruzzi M, De Benedittis M, et al. Dental Health and Mortality in People With End-Stage Kidney Disease Treated With Hemodialysis: A Multinational Cohort Study. *Am J Kidney Dis Off J Natl Kidney Found*. 2015;66(4):666-76.
 14. Cohen G, Haag-Weber M, Hörl WH. Immune dysfunction in uremia. *Kidney Int Suppl*. 1997;62:S79-82.
 15. Vanholder R, Ringoir S. Infectious morbidity and defects of phagocytic function in end-stage renal disease: a review. *J Am Soc Nephrol JASN*. 1993;3(9):1541-54.
 16. Khaire DrS D, Khaire DrSS. Bell's Palsy: An Unusual Complication Secondary To Odontogenic Space Infection A Case Report. *IOSR J Dent Med Sci*. 2017;16(03):06-11.
 17. Ravunniarth LM, Kauser S. Lower motor neuron facial palsy secondary to parotid abscess - first sign of uncontrolled diabetes mellitus: a case report. *Int J Otorhinolaryngol Head Neck Surg*. 2020;6(6):1206.
 18. Koide C, Imai A, Nagaba A, Takahashi T. Pathological findings of the facial nerve in a case of facial nerve palsy associated with benign parotid tumor. *Arch Otolaryngol Head Neck Surg*. 1994;120(4):410-2.