

Case Report

Parotid Abscess-Associated Facial Palsy in Hemodialysis Patients: Clinical and Surgical Considerations

Pavithran Ashokkumar^{1*}, Govindarajan Valanthan Veda Giri¹, Kalpa Pandya¹

¹Department of Oral and Maxillofacial Surgery, Faculty of Dental Sciences, Sri Ramachandra Institute of Higher Education and Research, Chennai, India.

*E-mail ✉ ivapcool96@gmail.com

Received: 17 August 2022; Revised: 27 October 2022; Accepted: 28 October 2022

ABSTRACT

A parotid abscess is an uncommon condition that is usually associated with an immunocompromised state. End-stage renal disease (ESRD) is recognized to enhance the risk of infections (DNI) by twofold. Parotid abscesses in ESRD patients may be violent, extending into surrounding regions, and causing facial paralysis. Due to alterations in their protein binding, volumes of distribution, kidney clearance, and non-renal clearance, infection management in patients with ESRD is challenging and often requires modifications to standard treatment approaches. There are very few cases of facial palsy associated with parotid abscesses in the literature. Although the precise cause and mechanism of this palsy remain unidentified, nerve compression is the most likely explanation. Corticosteroids and physiotherapy are suggested therapeutic modalities to improve neurological function more rapidly; however, there are no explicit guidelines for this. In this case report, we describe how a patient with end-stage renal illness was treated for a parotid abscess with facial palsy. We describe a patient who has been receiving dialysis for the past 15 years and has a parotid abscess, facial paralysis, underlying ESRD, and uncontrolled diabetes. Given the high-risk nature of the patient, the incision and drainage were performed under local anesthetic. After confirming the dosages' renal safety, appropriate antimicrobial treatment was given. The patient had partially recovered from the paralysis and was asymptomatic four weeks after presentation.

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

How to Cite This Article: Ashokkumar P, Giri GVV, Pandya K. Parotid Abscess-Associated Facial Palsy in Hemodialysis Patients: Clinical and Surgical Considerations. Asian J Periodontics Orthod. 2022;2:47-50. <https://doi.org/10.51847/naDu2XfBBQ>

Introduction

Immunocompromised status is frequently linked to a rare condition called a parotid abscess [1, 2]. Due to decreased salivary flow and dehydration, particularly when combined with poor oral hygiene, patients with end-stage renal disease (ESRD) may be more susceptible to developing a parotid abscess. Facial palsy is generally linked with a malignant parotid tumor and is unusual in combination with a parotid abscess with just a few occurrences in the literature [3, 4]. Although the precise cause and mechanism of this palsy are uncertain, the most likely cause is perineuritis and nerve compression [5].

One of the main causes of death for patients receiving hemodialysis for end-stage renal disease is infection [6]. Protein binding, volumes of distribution, kidney clearance, and non-renal clearance may all change in ESRD patients, requiring pharmacological dosage modifications to avoid toxicity [7-9]. In consequence, the antibiotic treatment that is thought to be required to treat the illness is compromised by limited medication dosages [10]. These patients are difficult to manage because of their elevated anesthetic risk, fluid restriction requirements, and continuous renal dialysis, which frequently necessitates a change in standard treatment approaches [11].

In this case, we describe how a patient with end-stage renal illness was treated for a parotid abscess with facial palsy.

Case report

History and examination

In our department, an 84-year-old woman came in complaining of discomfort and swelling on her left cheek over the previous month. She has been receiving dialysis three times a week, has stage 5 chronic kidney disease (CKD), and has had unmanaged type 2 diabetes mellitus for the previous fifteen years. The patient had bilateral pedal edema, was weak and agitated, and had no urine output. A local test showed a diffuse swelling on the left side of the face, measuring about 11 x 6.5 cm. This swelling elevated the ear lobule and extended anteriorly up to the face's midline, posteriorly up to the preauricular area, upwards up to the left infraorbital area, and downward up to the middle of the sternocleidomastoid (**Figures 1a and 1b**). On the neck, the edema crossed the midline. The swelling felt warm, indurated, and painful to the touch. The mouth could not expand wide enough. The patient further showed that the left eyelid could not be fully closed and that the left part of the forehead did not have wrinkles, which had started after the swelling started.



Figure 1. a) patient exhibiting swelling in the left side of the face, and b) swelling seen in the preauricular, submandibular, and submental region

Imaging

Two days before the appearance, a head and neck computed tomography (CT) scan showed heterodensity in the left superficial lobe of the parotid

gland, suggesting a potential parotid disease (**Figure 2**). To define and validate the CT results, a left cheek ultrasound (USG) was performed. According to USG, there was a residual collection that extended into submasseteric space, mostly in the parotid area.



Figure 2. Computed tomography scan, (axial section) showing thickened left masseter muscle and an underlying area of decreased density representing abscess formation

Management

If not treated right away, the rapidly increasing edema might have compromised the airway. Both the patient and the healthcare professionals were opposed to hospitalization and general anesthesia due to the high danger of general anesthesia and the continuing coronavirus epidemic. Thus, under local anesthetic, the patient was brought up for an emergency incision and drainage. An intraoral incision was made in the external oblique area, and an extraoral incision was made in the skin over the posterior portion of the cheek in the dependent region while under local anesthetic and aseptic measures. Throughout the surgery, the patient's vital statistics were tracked. A culture swab and pus aspirate were sent for microbial culture and antibiotic sensitivity testing after around 50 milliliters of pus had been removed. An extraoral corrugated rubber drain was inserted when the edema was observed to significantly subside (**Figures 3a and 3b**).



a)

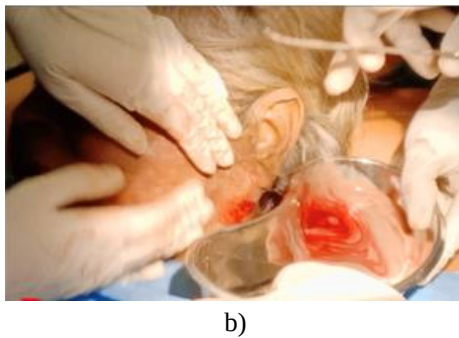


Figure 3. a) extraoral incision and drainage of submassetric abscess performed, and b) collection of Pus

Amoxicillin and 625 mg of clavulanic acid were administered empirically to the patient every 12 hours. *Klebsiella pneumonia*, sensitive to the combination of Cefoperazone and Sulbactam, was identified by pus culture. According to nephrologists, the standard adult dosage of 2 grams 12 hours per day was changed to 1.5 g intravenously 12 hours per day for 7 days. Regular drainage was performed, and the patient was evaluated in the outpatient department on consecutive days. The patient had no edema or pus discharge four weeks after presentation (**Figure 4**).



Figure 4. Complete resolution of the swelling seen at 1-month follow-up

Within ten days following the surgical drainage, there was a rapid partial recovery of paralysis, and the patient continued dialysis during the abscess therapy. The patient's informed agreement was obtained before the study was published.

Results and Discussion

CKD patients are frequently vulnerable to retrograde parotitis, which is thought to be caused by a mixture of

direct gland involvement, chemical inflammation, side effects of drug therapy, dehydration, and mouth breathing. Immunocompromised status is an established risk component for parotid abscess. Additionally, decreased salivary flow rate and changes in salivary gland metabolism may predispose a person to salivary gland infections.

Patients with ESRD are at risk for head and neck infections, which might weaken their immune system [12]. Palmer *et al.* found that poor oral health is linked to early death in their multicenter cohort analysis of 4205 renal dialysis patients with ESRD [13]. It has been established that several variables make ESRD patients more vulnerable to infections. ESRD patients are more prone to infections due to several reasons, including decreased T cell activity, poor phagocytosis, and decreased antibody production [14, 15]. In this instance, the parotid abscess was treated to help hasten the cure of the illness, and both diabetes and ESRD were appropriately controlled.

As was observed in the present instance, facial paralysis in the parotid abscess is thought to be caused by ischemic neuropathy brought on by the local toxic impacts of infection and nerve compression from the growing abscess. There are no precise criteria for the use of physiotherapy and corticosteroids, even though they have been advocated as therapeutic methods for a quicker recovery of nerve function [16]. Furthermore, several writers have suggested that nerve compression be relieved by draining abscesses and monitoring the nerve function to ensure it recovers [17, 18]. Due to the patient's ESRD and diabetes, corticosteroids were skipped, and the patient was monitored to make certain nerve function had recovered.

Conclusion

An elevated rate of infections and associated mortality are linked to ESRD. Patients with end-stage renal disease may exhibit aggressive behavior, facial paralysis, and expansion into neighboring regions due to parotid abscesses. The illness requires immediate care but with careful drug use. Recovery is frequently gradual and necessitates ongoing care with careful patient monitoring.

Acknowledgments: This case report was supported by the Oral Maxillofacial Surgery Department, Faculty of Dental Sciences, Sri Ramachandra Institute of Higher Education and Research, Chennai.

Conflict of Interest: None

Financial Support: None

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

References

1. Tan VE, 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.* 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.* 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.* 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.* 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.* 1993;3(9):1541-54.
16. Samir D, Khaire SS. 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.