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Case Report

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Facial Nerve Palsy Secondary to a Parotid Abscess: A Rare Occurrence

Siti Nurul Aliaa Mohd Nor[1*], Jasmine Pei Ying **Kho**[2], Norazwani **Azwal**[2]

Abstract

Facial nerve palsy in the context of a parotid mass is almost always associated with an underlying malignancy. Benign inflammatory or infective conditions such as parotid abscesses rarely result in facial nerve palsy. To date, only about 17 cases have been reported worldwide. This report describes a 69-year-old man who presented with a parotid abscess complicated by complete lower motor neuron facial nerve palsy. This rare presentation necessitated ruling out malignancy using imaging, intraoperative evaluation, and histopathological analysis. The diagnosis of sialadenitis-related abscess complicated by facial palsy highlights the importance of considering non-malignant aetiologies in such cases.

Keywords: Parotid abscess, Facial nerve palsy, Complications, Sialadenitis

Author Details:
1 Department of Otorhinolaryngology, Head & Neck Surgery , Kuliyyah of Medicine, International Islamic University Malaysia
2 Department of Otorhinolaryngology, Sarawak General Hospital, Malaysia

***Correspondence:**
Siti Nurul Aliaa Mohd Nor
aliaamohdnor89@gmail.com

INTRODUCTION

Facial nerve palsy is customarily an ominous sign of parotid malignancy hence its occurrence in cases of abscesses is exceedingly rare.[1-3] Parotid malignancies presenting with facial nerve palsy have poorer prognosis and indicate poorer survival rates.[4] Timely differentiation between parotid malignancy and an abscess is crucial, not only for appropriate management but also to avoid unnecessary delays in treatment. This case report describes a case of a facial palsy secondary to an extensive parotid abscess, its diagnostic challenges, and its management approach.

CASE REPORT

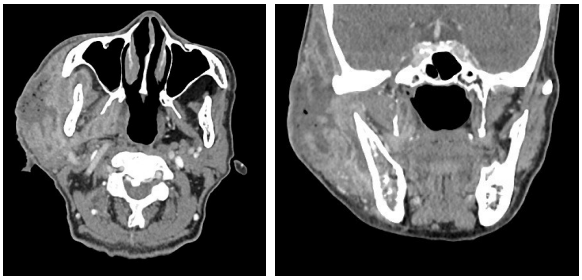
A 69-year-old Iban gentleman with underlying diabetes mellitus, hypertension and dyslipidaemia was referred to the Otorhinolaryngology service one month history of a right parotid swelling that was associated with pus discharge of one week duration. There was associated fever and trismus leading to reduced oral intake and generalised weakness. On physical examination, there was a right parotid swelling that measured approximately 6 x 8cm. It was fluctuant, tender and the overlying skin was erythematous with multiple puncta with pus discharging (**Figure 1a**). There was trismus of approximately ½ finger breadth. Importantly there was a right facial nerve palsy, House-Brackmann grade VI (**Figure 1b**). There was no cervical lymphadenopathy. Total white cell count was raised (12 x 10^9/dL) and random glucose level was deranged up to 14 mmol/L.

Intravenous (IV) antibiotics cefuroxime 750mg tds and IV metronidazole 500mg tds were started and contrast enhanced computerised tomography (CECT) of the neck requested. This showed a large multiloculated rim enhancing collection likely representing parotid abscess, with local extension into the infratemporal fossa, parapharyngeal space, deep lobe of parotid gland and surrounding muscles with poor plane with the carotid space (**Figure 2**). The patient proceeded to an incision and drainage under general anaesthesia, using a modified Blair's incision and 50ml of frank pus was drained. Intra-operatively, it was possible to identify the right facial nerve both anatomically and physiologically. Tissue culture and biopsy taken and sent for histopathological examination.

Post-operatively, blood sugar level was strictly controlled with insulin therapy. Wound cultures and smear were negatives, including acid-fast bacilli. Multiple repeated parotid tissue samples sent for histopathological examination displayed features in keeping with sialadenitis with no features of parotid malignancy. Good eye care with regular eye drops and taping of eye at night was also advised to avoid corneal abrasion.

Follow up at one, two and six months showed progressive wound healing and no recurrence. Unfortunately, there was no recovery of the facial nerve palsy. A magnetic resonance imaging (MRI) was done and this did not show any evidence of other suspicious pathology. The patient was referred to plastic and reconstructive team for lateral tarsorraphy and facial reanimation operation however patient was not keen to proceed.

Figures 1: Right parotid swelling with multiple puncta and pus discharge.



Figures 2: Computed tomography scan (Axial and coronal views) showing right parotid abscess.

DISCUSSION

Benign parotid diseases like abscesses or sialadenitis very uncommonly result in facial nerve palsy. They are usually caused by ascending infection through the Stensen's duct, poor oral hygiene or from peri or intraparotid lymphadenitis.[5] Various types of pathogens of bacterial, viral or fungal nature has been isolated in parotid abscesses. Some of the bacterial entities are *Staphylococcus aureus*, *Streptococcus pyogenes*, *Mycobacterium tuberculosis* and pseudomonas species while viruses can be from *Epstein-Barr virus*, *HIV* and *human parvovirus* B19. *Candida albicans* have also been reported to be isolated in parotid abscess. Despite this, majority of the abscesses had no specific pathogen isolated as seen in our case.[2]

Management of parotid abscess includes broad spectrum intravenous antibiotics, adequate hydration, sialogogues and CT scan especially in cases of facial nerve palsy to look for features of malignancy and assess the extension of the abscess for operative intervention and drainage.[2] Indications for surgery would be absence of clinical improvement with antibiotics, presence of facial nerve palsy and involvement of deep neck spaces.[5]

Facial nerve palsy more commonly seen in deep lobe parotid abscesses as opposed to superficial lobe.[5] Surgical approach will depend on the extent and location of the collection. An intraoral approach for deep lobe parotid abscesses is preferred where tonsillectomy is first performed and the collection is drained from the tonsillar bed.[5] This approach has the advantage of avoiding external wound or scar, but if the collection is extensive and involving the superficial aspect, an external approach would result in better drainage like in this case.

Facial nerve palsy can be caused by injuries occurring anywhere along its course. This mixed sensory and motor nerve has both intracranial and extracranial portion. A parotid pathology would affect the nerve at the level distal to the stylomastoid foramen where it exits the skull and becomes extracranial before dividing into 5 branches supplying different facial muscles.[6] Prompt treatment addressed at the cause of facial nerve palsy may result in improvement and avoid permanent disfigurement.[6]

Facial nerve palsy in benign parotid pathologies is believed to occur due to a combination of factors. First is perineuritis resulting from the release of bacterial toxins (endotoxins/exotoxins) in close proximity to the nerve, leading to localised inflammation. Another mechanism involves ischemic neuropathy and mechanical compression, which arise from increased pressure caused by an expanding abscess, contributing to nerve dysfunction at the level of the stylomastoid foramen or the distal extracranial portion of the facial nerve. Additionally, the infection may exert a direct cytotoxic effect due to involvement of bacterial or fungal pathogens.[2,3,7] In this case, these mechanisms explain the lower motor neuron facial palsy seen without any malignant cause. The involvement of the deep lobe and its proximity to the facial nerve likely aggravated the compression and toxicity, effectively severing the nerve's functional continuity. Prompt intervention to reduce nerve exposure to ongoing inflammatory damage is critical, especially as longer delays may lead to permanent nerve dysfunction, as noted in this case. A systematic review looking at the occurrence of facial palsy in benign parotid pathology showed that about 82% of the cases showed some degree of facial nerve recovery while 19.4% did not show any recovery as seen in our case here.[8] The average recovery time for facial palsy following surgical drainage in the mentioned parotid abscess cases typically ranged from 2 to 6 months.[1]

Facial nerve palsy in parotid pathology should always raise suspicion of malignancy until proven otherwise. To systematically exclude malignancy in this case, several measures were undertaken. A detailed clinical evaluation and symptom history were performed, revealing the absence of a fixed mass, regional or cervical lymphadenopathy, and systemic symptoms typically associated with malignancy, which pointed toward a benign inflammatory process. Imaging with a contrast-enhanced CT scan showed a multiloculated rim -enhancing lesion with surrounding inflammation and no solid mass component, strongly suggesting an abscess and reducing the likelihood of malignancy. Intraoperative findings revealed no gross features suspicious of malignancy, and tissue samples from the parotid collection were sent for histopathological analysis to confirm the absence of neoplasia. Multiple histopathological evaluations, including repeated biopsies, consistently demonstrated sialadenitis and chronic inflammation without evidence of malignancy. This comprehensive assessment allowed for the timely treatment of a benign abscess while confidently excluding malignancy.

Facial expression significantly impacts daily human interaction, making facial nerve palsy not just a functional issue but also a psychological challenge. Management of facial nerve palsy involves both surgical and non-surgical considerations. Apart from the aesthetic concerns, facial paralysis results in the inability to close the eye, leading to issues like corneal exposure keratitis, epiphora due to a compromised lacrimal pump system and potential prolapse of the external or internal nasal valve, affecting breathing.[9] Swallowing problems arise from issues dealing with oral incompetence with a reported rate of up to 79%, with 55% showing swallowing dysfunction in an electrophysiological analysis.[10]

The approach to treating facial palsy must be personalised for each case, considering factors such as the patient's age, prognosis, functional needs, aesthetic goals, and psychological well-being. Non-surgical interventions include the use of lubricating eye drops, nighttime eyelid taping, and the application of Botulinum toxin on the unaffected side to enhance symmetry. Additionally, physiotherapy and speech therapy are valuable interventions commonly utilised.[9]

In cases where surgical intervention is necessary, repairing nerve injuries promptly whenever possible is crucial to optimise the chances of recovery. However, in scenarios like ours, identifying the facial nerve anatomically and physiologically was challenging due to the surrounding inflammation from abscess formation. Persistent facial palsy may necessitate facial

reanimation techniques, which can be static or dynamic in nature.[9]

Static techniques, such as facelift procedures with or without facial slings, brow lifts, and eyelid surgeries like lateral or medial tarsorrhaphy or eyelid weighting, enhance facial symmetry at rest.[9] On the other hand, dynamic techniques focus on regaining functional facial movement and can involve nerve-based or muscle-based reconstructions using regional or free muscle transfers. Nerve-based reconstruction techniques include nerve transposition or grafting to ipsilateral nerves like the hypoglossal or masseteric nerve, or to the healthy contralateral facial nerve (cross facial nerve), utilising nerve grafts from other donor sites such as the sural and great auricular nerves.[11] Muscles typically experience irreversible atrophy after approximately 12-18 months of denervation, setting a limited timeframe for nerve reconstruction.[11] Functional muscle transfers are generally preferred in such settings. Muscle-based reconstruction may entail procedures like free gracilis transfers innervated by the cross facial or masseteric nerve, with or without nerve grafts.[9,11] While various other advanced techniques for facial reanimation are available, they are beyond the scope of this discussion.

CONCLUSION

While parotid swelling with facial nerve palsy is a concerning indicator of malignancy, benign parotid pathologies such as abscesses should also be considered in differential diagnoses. A systematic approach encompassing both imaging and histopathological evaluation is vital for accurate diagnosis. Rare cases such as this highlight the need for heightened clinical vigilance and provide valuable learning for managing similar presentations.

Take Home Message

- Facial nerve palsy associated with parotid pathology is predominantly linked to malignant conditions.
- The occurrence of facial nerve palsy due to a parotid abscess is exceptionally rare.
- Facial nerve palsy resulting from a parotid abscess can be permanent in some cases.

Abbreviations

CT	Computed tomography
IV	Intravenous
MRI	Magnetic resonance imaging

Declarations

Conflict of interests

The authors declare no conflict of interests.

Consent

Consent has been obtained from patient's parents for publication.

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