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journal homepage: www.casereports.comReversible facial nerve palsy due to parotid abscess^{☆,☆☆}

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ABSTRACT

INTRODUCTION: A facial nerve palsy combined with parotid enlargement usually suggests malignancy. It is highly unusual for facial nerve palsy to result from a benign situation such as inflammation or infection of the gland.

PRESENTATION OF CASE: We present a rare case of facial nerve palsy due to parotid abscess.

DISCUSSION: A literature search retrieved thirty-two cases of facial nerve palsy due to benign parotid lesions since 1969. Only nine reported the presence of a parotid abscess. The etiology of paralysis remains unknown although certain factors such as the virulence of the offending organisms or perineuritis, have been suggested. Best diagnostic evaluation and management are discussed.

CONCLUSION: In clinical practice, exclusion of malignancy is mandatory, as it represents the most common cause of facial palsy in the presence of a parotid lump.

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1. Introduction

Facial nerve palsy associated with a parotid mass suggests malignancy. However, a few cases of benign lesions of the gland causing facial nerve paralysis have been reported. Such lesions can be benign mass lesions¹ (pleomorphic adenomas, Warthin's tumor and benign cysts) or infectious diseases, such as parotitis and parotid abscess.² We present a rare case of reversible marginal mandibular branch palsy, due to a parotid abscess.

2. Presentation of case

An 87-year-old lady presented with fever, swelling of the left parotid gland, purulent discharge through Stensen's duct and paresis of the marginal mandibular nerve of the corresponding side (Fig. 1). She had already received antibiotic treatment for 15 days for a urinary tract infection. The patient had routine blood results consistent with acute inflammation and dehydration. Swabs were taken from Stensen's duct for culture and sensitivity tests. Empiric antibiotic intravenous treatment was commenced while waiting for the culture and sensitivity results.

Ultrasound scan of her left parotid demonstrated diffuse swelling without abscess formation, while a CT scan of the neck revealed a multifocal abscess of the left parotid involving the deep lobe (Fig. 2). Therefore an incision and drainage procedure was recommended. A standard parotidectomy incision was performed and the abscess was drained by opening the fascia of the gland with a clip forceps, parallel to the branches of the facial nerve. During the procedure, new swabs and a tissue biopsy were taken from the lesion to rule out malignancy. The swab results were inconclusive as the patient was already on antibiotic treatment. The histology report was negative for malignancy.

After the surgery, the condition of the patient was continuously improving and 8 days later, a partial recovery of the facial palsy was noticed. Within another week the parotid infection had resolved and the facial nerve function was almost normal (Fig. 3).

3. Discussion

Acute suppurative sialadenitis is primarily attributed to salivary stasis and is believed to result from ductal obstruction or decreased production of saliva. Predisposing factors may include calculi, duct stricture, dehydration, autoimmune disorders, and congenital sialectasis. Additionally, the serous saliva produced by the parotid gland has reduced bacteriostatic activity and less concentration of lysozymes and IgA compared to the mucinous saliva of the mandibular gland, explaining the commoner suppuration and abscess formation within parotid glands. Other contributing factors include poor oral hygiene, immunosuppression, diabetes mellitus, reduced resistance to pathogens and lack of mastication as a stimulus to saliva production.

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^{☆☆} The case was presented as a poster in the 16th Pan-Hellenic Congress of Otorhinolaryngology, Head & Neck Surgery, 1st–4th December 2011, Athens, Greece.

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Fig. 1. Left marginal mandibular palsy. Note the swollen left parotid gland (arrow) and the deviation of the left angle of the mouth.

The commonest bacteria involved are *Staphylococcus aureus* and anaerobes and also Gram-negative bacilli; however *Streptococcus pyogenes*, *Mycobacterium tuberculosis* and pseudomonas infections have been reported. Clinical signs involve rapid onset of local pain and facial swelling, erythema, trismus and occasionally referred pain to the ear, cheek, jaw or neck. On palpation there is tenderness, warmth and induration of the overlying skin and bimanual maneuver of the gland results in suppurative discharge from Stensen's duct orifice in approximately three fourths of cases. Systemic manifestations include fever, chills, and malaise and the patient might demonstrate signs of systemic dehydration.

Palsy of the extratemporal part of the facial nerve, as opposed to the intracranial part, is a very rare clinical manifestation in inflammatory processes and in benign lesions and in these cases a malignant process must always be excluded. However as early as 1969, there are reports of benign lesions causing facial nerve palsy; benign mixed tumors, lymphoepithelial cysts,³ adenolymphomas,⁴ epidermoid and epithelial cysts,⁵ inflammatory pseudotumour⁶ are implicated in the literature. Suppuration and abscess formation



Fig. 3. Fifteen days later the parotid infection has resolved. The function of the facial nerve has almost returned to normal.

in the parotid are also benign extremely rare causes of facial nerve palsy and very few cases have been reported.⁷

In a study regarding infective causes of facial nerve palsy, 29 patients with 30 facial nerve paralyzes were examined and only one of these was attributed to suppurative parotitis. The rest were due to otologic diseases (cholesteatoma, acute otitis media and mastoid cavity infection).⁸ Few cases of parotid infection associated with facial nerve paralysis have been described and only 9 of them referred an abscess formation as the causative factor.^{5,6,9,10}

Parotid abscesses may arise from ductal ectasia, primary parenchymal involvement or infection of the intra-parotid lymph nodes. Other factors such as diabetes mellitus predispose.¹⁰ Involvement of the seventh nerve may be explained on the basis of compression, especially in association with local inflammation.¹ However the etiology of paralysis remains unknown and other causes, like the virulence of the offending organisms or perineuritis, have been suggested. Streppel et al.⁵ presented a case of facial nerve palsy due to an infected epidermoid cyst which did not enclose the facial nerve. It was then assumed that the inflammation was spread into the fallopian canal through the stylomastoid foramen causing a metabolic imbalance similar to the supposed vicious circle for Bell's palsy. Endo et al.¹¹ described a nerve facial palsy immediately after mumps parotitis pointing out a possible viral involvement, while Ebstein Barr virus has also been associated with parotitis and facial palsy.¹² Ischemic neuropathy arising from the local toxic effects of a severe infection and from the compression of the nerve due to an expanding abscess is another suggested mechanism. This ischemia of the facial nerve bundles was histologically documented before in a case of Warthin's tumor causing facial nerve palsy by compression.¹³

The presence of facial palsy simultaneously to a parotid enlargement needs detailed examination. Acute signs of infection – high temperature, tenderness, redness – have to be treated with empirical antibiotic administration and if there is a purulent discharge swabs must be taken in order to determine the appropriate



Fig. 2. Axial CT view of the left parotid demonstrating a multifocal abscess (arrow) extending to the deep lobe of the gland.

therapy. Important adjuvant measures as hydration, sialogogues and good oral hygiene are considered necessary. Differential diagnosis involves sialolithiasis, diffuse parotitis, abscess formation and benign or malignant masses.

Imaging of the gland is indicated in patients who do not respond to medical therapy within 48–72 h. Ultrasound scan (US) is the initial imaging modality of choice for the assessment of palpable abnormalities of the parotid gland or suspected parotid calculus disease. It has the ability to distinguish a cystic from a solid lesion, a diffuse parotid swelling from lymph nodes or an abscess and detect malignant features of the examined lesions; it can also be used to guide fine-needle aspiration biopsy or core biopsy. In acute inflammatory diseases sonography can differentiate between obstructive or non-obstructive sialadenitis. Abscess formation as well as the extent of the collection may be assessed. Abscesses can be punctured under US guidance, as an alternative to incision and drainage procedure. However certain limitations of sonography dictate the use of further imaging modalities such as CT or MRI. Ultrasound has limited visualization of the deep lobe of parotid gland which is obscured by the mandible. Lesions suspicious for malignancy that appear benign on ultrasound should be considered for biopsy. For lesions of the deep lobe or malignancy confirmed on cytology, an MRI or CT is mandatory to evaluate tumor extent, local invasion and perineural spread.¹⁴

To rule out malignancy in patients presenting with a parotid mass cytologic evaluation by means of fine needle aspiration biopsy (FNAB) or histologic evaluation of the mass by surgical excision (parotidectomy) are necessary. FNAB allows the patient to be counseled preoperatively for the possibility of elective sacrifice of a branch or of the entire nerve in case of malignant infiltration as appropriate. FNAB may be helpful in establishing the diagnosis of a benign tumor in patients in whom elective surgery is contraindicated.¹⁵ Given the significant incidence of false-positive results with FNAB,^{16,17} some authors suggest that elective resection of vital structures (e.g., facial nerve) should be deferred until permanent histologic results are available. Therefore the management for many patients with parotid neoplasms includes biopsy and tumor removal in a single step employing partial parotidectomy with facial nerve dissection.^{15,18}

The diagnosis can also be made based on frozen sections (FS) intraoperatively.¹⁹ However there is controversy whether FNAB or FS is more accurate in the diagnosis of salivary gland lesions, or the two methods are complementary to each other.²⁰ There are supporters of the reliance on frozen section diagnosis intraoperatively for parotid neoplasms when diagnosis is made by experienced pathologists even if difficult decisions relative to preservation of facial nerve's integrity are to be made; however, according to Myers, the relative rarity of these malignancies makes the use of frozen section diagnosis in community hospitals imprecise at best.¹⁵ The evaluation of a salivary malignancy with frozen section biopsy is risky when contemplating the resection of the facial nerve, but seems to be the most helpful in the evaluation of enlarged upper cervical lymph nodes.

Open biopsy of parotid neoplasms is rarely indicated in highly selected cases, when clinical manifestations strongly suggest malignancy and the diagnosis is not secured by FNAB or for establishing the diagnosis of infiltrative diseases like sarcoidosis, benign lymphoepithelial lesions associated with the collagen vascular disease (systemic lupus, Sjögren's syndrome) or non-Hodgkin's lymphoma. Open biopsy and permanent pathologic evaluations are also indicated when resection of a normal facial nerve is required. An open biopsy without facial nerve dissection of the routinely encountered parotid mass is contraindicated because of the risk to the facial nerve and potential dissemination of pleomorphic adenomas to the adjacent tissues, increasing the risk of recurrence.¹⁵

In the presented case, the potential malignancy sign of facial nerve palsy dictated the need for a CT scan assessment and a biopsy of the lesion. The multifocal abscess extending toward the deep lobe of the gland led to the decision for incision and drainage. During the procedure, care was taken to avoid injury of the facial nerve. An alternative method, as already mentioned, is the use of CT- or ultrasound-guided imaging to perform a fine-needle aspiration of the abscess. A rapid partial recovery of the paralysis was obvious 8 days after the surgery and within 15 days the recovery was almost complete.

4. Conclusion

Facial nerve paralysis accompanying benign parotid lesions is a rare condition. A parotid abscess causing facial nerve palsy is even more uncommon. The presence of a malignant lesion must always be ruled out. Ultrasonography is the initial modality of choice for evaluating palpable abnormalities of the parotid gland. CT or MRI scan is the modality of choice for lesions of the deep lobe and malignancy lesions, evaluating tumor extent, local invasion and perineural spread. A complete recovery of the facial nerve palsy is the commonest outcome, as reported in most cases of benign parotid lesions, including abscesses

Conflict of interest

The authors declare that they have no conflict of interest.

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Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contributions

All authors have participated in the data collection, analysis and writing of the manuscript.

Dr. J.K. Hajjioannou was responsible for planning and editing of this manuscript. Dr. V. Florou performed the literature review and writing of this paper. Dr. P. Kousoulis and Dr. D. Kretzas were involved in data collection and Dr. Ef. Moshovakis was involved in the planning of this paper.

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