Malakoplakia of the parotid gland: a case report and review of localised malakoplakia of the head and neck

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ABSTRACT

INTRODUCTION Malakoplakia is a rare chronic inflammatory disorder, predominantly affecting the urinary tract. In the head and neck region, it is very rare and may confuse the clinicians during investigations, as features may mimic malignancy.

MATERIALS AND METHODS We report a case of malakoplakia involving the parotid gland and review of the reported cases of malakoplakia in head and neck region.

RESULTS Histologically, this is the first classic case report of malakoplakia involving the parotid gland in the world literature. A total of 49 cases have been reported in the head and neck region; 38.7% of these are cutaneous. In soft tissue, the tongue is the most common site. Salivary gland involvement is very rare. Previously, submandibular salivary gland involvement has been reported.

CONCLUSION A possibility of malakoplakia should be considered as a differential diagnosis in patients with enlarged head and neck masses. Histology is essential to diagnose this benign inflammatory disorder and to differentiate from a malignant process.

KEYWORDS

Malakoplakia – Head and neck – Parotid – Histology

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Introduction

First described in 1902 by Michaelis and Gutmann and then by von Hasemann in 1903, who introduced the term malakoplakia (from the Greek *malacos*, soft and *placos*, plaque), the condition represents a very rare benign granulomatous disease. The usual clinical presentation is friable yellow soft plaques, that typically occurs in the genitourinary and gastrointestinal tracts.^{1–5}

Malakoplakia appears histologically as sheets of histiocytes with cytoplasmic granular periodic acid–Schiff (PAS) positive. Because of defective lysosomal function, calcium and iron may accumulate in the phagosomes, forming the pathognomonic Michaelis–Gutmann bodies. These bodies can be intracellular or extracellular and are basophilic, round, and may be targetoid, with a dense, central core.^{6,7} Ultrastructural findings on electron microscopy include the presence of phagolysosomal cytoplasmic inclusions comprising vesicles, electron-dense bodies, membranous lamellae and crystalline Michaelis–Gutmann bodies.¹⁴

The aetiology of malakoplakia has not been fully elucidated, but the morphologic features are similar in all organs. Three possible mechanisms have been suggested. The first theory postulates that micro-organisms may play a role.^{4,5,10,14,17} The most frequent micro-organisms reported are *Escherichia coli*, *Mycobacterium tuberculosis*, *Staphylococcus aureus*, *Rhodococcus equi*. The second mechanism describes an abnormal or altered immune response involved in pathogenesis, sustained by the fact that malakoplakia is mainly encountered in patients with immune deficiency.¹⁶ The third mechanism describes an abnormal macrophage response because of defective lysosomal function.^{3–7} This results in the inability of the macrophage to destroy the phagocytised bacteria, with formation of Michaelis–Gutmann bodies. Michaelis–Gutmann bodies stain positive with periodic acid–Schiff reagent, von Kossa's reaction for calcium and Perl's ferrocyanide reaction to ferric iron.¹⁰

A total of 49 cases of malakoplakia affecting the head and neck area have been previously described in the world

Table 1 Cases of organ-specific head and neck malakoplakia that have been described in the literature (N = 49).

Area	Cases (n)
Cutaneous malakoplakia	18
Tongue	8
Temporal bone and middle ear	5
Larynx and trachea	4
Nose and sinuses	4
Thyroid	4
Valeculia and epiglottis	2
Tonsils	2
Submandibular gland	1
Parotid gland	1

literature. Eighteen of these cases are cutaneous malakoplakia. Table 1 shows the number of organ-specific head and neck malakoplakia that have been described in the literature.

Malakoplakia has been mainly described in immune-compromised patients (organ transplantation, immune-suppressive treatment, malignancy, acquired immune deficiency) or with chronic debilitating conditions (diabetes mellitus, malnutrition, tuberculosis, sarcoidosis, alcohol abuse, prolonged systemic steroids treatment etc.).⁶⁻⁹ Malokoplakia in the genitourinary tract is four times more common in women than in men, but in other systems there is no gender or racial predilection.⁸ Malakoplakia tends to occur in adults, in the third to fourth decades of life, with an average age around 50 years. The age of diagnosis ranges from 6 weeks to 85 years. According to Long *et al* and Yousef *et al*, paediatric cases are scarce.^{4,8} Although malakoplakia is a self-limiting benign disease, mortality has been reported when affecting vital organs or because of underlying chronic conditions.^{7,9,16,20}

Clinical presentation and symptoms are usually non-specific and depend on the site of the lesion. The most frequently encountered symptoms include fever, pain, difficulty in swallowing, the sensation of having a foreign body in the throat and referred otalgia. On examination, the patient may present with a nodular growth in the affected organ, the presence of ulceration and discharge or regional lymph adenopathy.^{3,8,14,16,18}

As the initial presenting symptoms are non-specific, a definitive diagnosis always remains histopathological.

We discuss a case of malakoplakia involving the parotid gland. This is the first known classic case involving the parotid gland. In 1988, Dale *et al* reported possible malakoplakia involving the parotid gland, but the typical classical Michaelis-Gutmann bodies were not described in their lesion. In 2015, Schwob *et al* reported the first case of malakoplakia involving the submandibular salivary

gland.¹¹ These cases demonstrate that malakoplakia involving salivary glands are extremely rare.

Case history

A 64-year-old woman was seen at the head and neck lump clinic with a three-week history of a rapidly growing diffuse mass in the left parotid region, slightly tender on palpation, with no associated neck lymph adenopathy or facial nerve palsy. On examination, a diffuse tender swelling was noted in the left parotid region. Examinations of the oral cavity, oropharynx, nasal cavities, nasopharynx, hypopharynx and larynx were normal. An ultrasound performed at first presentation showed an ill-defined hypoechoic area at the tail of the left parotid gland. Fine needle aspiration cytology was carried out under ultrasound guidance. This showed the presence of abundant neutrophils and spindle cells. But the cytologist could not comment whether this was a benign pathology. Computed tomography with contrast was performed (magnetic resonance imaging was contraindicated in this patient), which revealed a diffuse 19 × 16 × 17 mm soft-tissue attenuation focus in the tail of the left parotid, that contained calcification (Fig 1).

As these features were not characteristic of a benign parotid lump and raised the possibility of a malignant process, surgical excision was decided for histological diagnosis. Under general anaesthesia, a left superficial parotidectomy was carried out with wide cuff of normal tissue around the lesion with preservation of the facial nerve. Postoperatively, the patient made an uneventful recovery with full facial nerve function.

Histological analysis of the specimen revealed an ill-defined area of fibrosis associated with active chronic inflammation. Within this inflammatory infiltrate were histiocytes and multinucleated giant cells with foamy/granular cytoplasm. Numerous intracytoplasmic laminated basophilic inclusions were seen, some of which had a targetoid appearance (Fig 2). The appearance was that of xanthogranulomatous inflammation with Michaelis-Gutmann bodies, consistent with malakoplakia (Fig 3). There was no evidence of malignancy.

At the 12-month follow-up, the patient remained well, with no evidence of local recurrence or any systemic ill health.

Discussion

Forty-nine cases have been reported so far in the head and neck region. More than 85% were found in patients with an immune-modified condition. There is no reported concomitant malakoplakia in other organs in any of these cases. But non-head and neck malakoplakia have been reported in association with malignancy, tuberculosis or acute infective process.^{4,7,14,17}

Differential diagnoses should include xanthogranulomatous inflammation, Langerhans cell histiocytosis, granular cell tumour, atypical mycobacterial infection, carcinoma or

Figure 1 a) Small area of high density in relation to the rest of the fatty parotid gland. b) Foci of calcification.

lymphoma, especially when the lesion is ulcerated or involving lymph nodes.^{10,15,15,16} Despite clinical and radiological suggestion in these cases, definitive diagnosis remains histological.

Review of the literature revealed that a number of treatment modalities have been used successfully. These include surgical excision alone, antibiotic therapy alone or combination of surgery and antibiotics. The choice of treatment depends on the anatomical site of involvement and the extent of the disease.^{8–10,16} Specific antibiotic therapy depends on the underlying bacterium showed on culture. The most common antibiotics that were used are quinolones (e.g. ciprofloxacin) and sulfonamides (e.g. co-trimoxazole), owing to their good intracellular penetration within macrophages.^{17,18} Although quinolones and ampicillin

have been used with equal success rates, ampicillin has not been used in any cases within the past 15 years, possibly due to widespread resistance of Gram-negative bacteria (especially *E. coli*).^{4,6,17,18}

The duration of medical treatment has not been standardised, because of the very small number of cases. Treatment varied from a few weeks to several months, based on the appearance of the lesion in association with culture results and patient status.^{17,18} Antibiotic therapy alone has been mainly used in patients with multiple disseminated small lesions, when surgery is not possible.²¹ Among all

Figure 2 A low-power view of the salivary gland tissue with inflammation.

Figure 3 High-power view showing sheets of inflammatory cells with the classical Michaelis-Gutmann bodies (arrow) present in the form of cytoplasmic laminated mineralised concretions.

49 cases studied, a successful resolution rate of 100% is reported when antibiotic treatment has been associated with surgery. This compared with only 50% successful resolution when antibiotics alone have been used. Recurrent disease requires surgery when possible. Vitamin C and bethanechol chloride have been used to increase macrophages function as an adjuvant therapeutic strategy, especially in immune-compromised patients.^{16–19}

As there is no reported evidence of malignant potential, it is accepted that surgical management alone or in combination with antibiotic therapy is curative.^{3,7,18,19}

Conclusion

Malakoplakia, although a rare condition in the head and neck region, should be considered in differential diagnoses in patients who present with enlarging mass, with or without lymph node involvement. As clinical presentation can mimic malignancy, especially when the lesion is ulcerated, a definitive histological diagnosis is mandatory. The pathologist should be aware of the possibility of the concomitant existence of more than one pathology in the specimen excised (association with tuberculosis or carcinoma). The mainstay of treatment is wide surgical excision where possible, together with antibiotics for a good prognosis.

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