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Basal Cell Adenoma of Deep Lobe of The Parotid Gland Commonly Misdiagnosed Tumour of Parotid Gland: A Case Report

Kauser Yesmin[1], Meghashyam Khyathi[2], A. K Rai[3], S.M Rahber Abidi[4]

[1]Senior Resident, Department of Otorhinolaryngology and Head and Neck Surgery, ESIC Medical College, Faridabad, India

[2]Assistant Professor, Department of Otorhinolaryngology and Head and Neck Surgery, ESIC Medical College, Faridabad, India

[3]Head of the Department, Department of Otorhinolaryngology and Head and Neck Surgery, ESIC Medical College, Faridabad, India

[4]Senior Resident, Department of Surgery, ESIC Medical College, Okhla, India

[*]**Corresponding author:**

Meghashyam Khyathi

Email ID: meghashayam@gmail.com

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ABSTRACT

Introduction- Basal cell adenoma is an uncommon benign epithelial neoplasm of the salivary glands, accounting for only 1–2% of all such tumours. While it most frequently arises in the parotid gland, it can also develop in the minor salivary glands. Due to its overlapping features with various benign and malignant salivary gland neoplasms, accurate diagnosis can be challenging. Definitive identification typically relies on detailed histopathological analysis.

Case Presentation- A 52-year-old female presented with a painless swelling in the right infra-auricular region. Imaging studies revealed a well-circumscribed hypodense mass located within the deep lobe of the right parotid gland, initially suspected to be a pleomorphic adenoma. Fine needle aspiration cytology (FNAC) yielded inconclusive results. As a result, the patient underwent total conservative parotidectomy. Histological evaluation confirmed the diagnosis of basal cell adenoma, revealing cystic spaces containing mucoid material and basaloid epithelial cells arranged in trabecular and tubular configurations.

Discussion- Basal cell adenoma was formally recognized as a distinct tumour entity in the 1991 WHO classification of salivary gland tumours. On cytological examination, it may mimic a variety of both benign and malignant neoplasms of salivary and non-salivary origin. The defining histological features include uniform basaloid cells with small, round nuclei, minimal cytoplasm, absence of atypia, and characteristic peripheral palisading. Surgical excision is the treatment of choice, with more extensive resection indicated for certain histological variants such as the membranous type due to a higher risk of recurrence.

Conclusion- This case underscores the clinical, radiological, and histopathological characteristics of basal cell adenoma of the parotid gland. Accurate diagnosis through histological assessment is essential for effective management. Timely surgical intervention is critical in ensuring favourable outcomes and minimizing the risk of recurrence.

Keywords: *Basal cell adenoma, Adenoma, Parotid gland, Parotid neoplasms, Salivary gland neoplasms*

1. INTRODUCTION

Basal cell adenoma (BCA) is an uncommon benign neoplasm of the salivary glands, comprising approximately 1% to 3% of all salivary gland tumors. Histologically, it shares several features with other salivary gland neoplasms, including pleomorphic adenoma, Warthin's tumor, and basal cell adenocarcinoma (BCAC), which complicates accurate diagnosis through fine needle aspiration (FNA) alone. Consequently, superficial or total parotidectomy is often required for definitive diagnosis and management.

Clinically, BCA typically manifests as a slow-growing, painless mobile mass. In this report, we present rare but characteristic case of parotid gland BCA. The hallmark histological finding is a monomorphic proliferation of basaloid epithelial cells. The condition predominantly affects individuals in their fifth to seventh decades of life. Compared to other salivary gland tumors, BCA generally has a favorable prognosis, with low recurrence rates. This paper details case of asymptomatic parotid swelling subsequently confirmed as BCA upon histopathological examination.

Salivary gland tumors are relatively rare, accounting for approximately 3–4% of all head and neck neoplasms. Among these, the parotid gland is the most commonly affected site, involved in about 70% of cases. Roughly 75% of parotid gland tumors are benign, while the remaining 25% are malignant. Benign parotid tumors are typically classified based on their cellular composition into *monomorphic* and *pleomorphic* types, with basal cell adenoma (BCA) being a representative example of the former.

The classification of BCA as a distinct pathological entity was first proposed in 1967 by Kleinsasser and colleagues, who described it as a salivary gland tumor composed of a uniform population of basaloid epithelial cells. This classification was later validated and formalized in the second edition of the World Health Organization (WHO) *Histological Classification of Salivary Gland Tumors* published in 1991, which recognized BCA—along with its malignant counterpart, basal cell adenocarcinoma, and canalicular adenoma—as separate diagnostic entities.

2. CASE REPORT

Patient information

A 52-year-old female housewife hailing from north India presented to our outpatient department with 2-year history of swelling below right ear which was insidious and progressive. There was no history of pain or sudden increase in size or change during/after meals. There was no history suggestive of trauma, local infections, or any salivary complaints. The patient had no comorbidity . There was no family history of similar lesions.

Clinical Findings

A diffuse non-tender right parotid swelling was identified with mixed consistency (predominantly cystic but with few hard areas) and fixity to underlying structures. A distinct hard nodule was identified at anterosuperior aspect with fixity to skin. The skin over the swelling was otherwise normal and there was no change of parameters with jaw clenching (Fig. 1). Facial nerve function was preserved, and intra-oral examination as well as neck examination was normal. Ear and nose were found normal.

Fig 1: Preoperative photo of right parotid swelling with no facial palsy

Diagnostic assessment

High-resolution ultrasonography gave the impression of pleomorphic adenoma (PA), however ultrasound-guided fine needle aspiration cytology (FNAC) suggestive of sialadenosis

CECT FACE AND NECK shows a well-defined well marginated round heterogeneously enhancing soft tissue density lesion in right parotid gland involving deep lobe with maintained fat planes with adjacent structure not associated with mandible or other bony destruction.

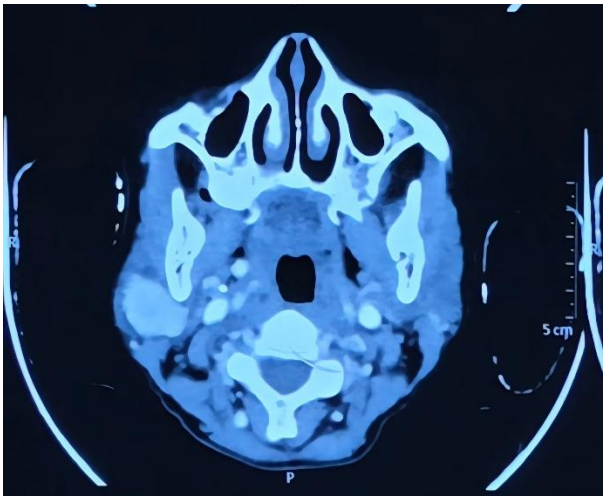

Fig 2: Contrast enhanced computed tomography saggital sections showing a well-defined hypodense lesion arising from deep lobe of right parotid gland.

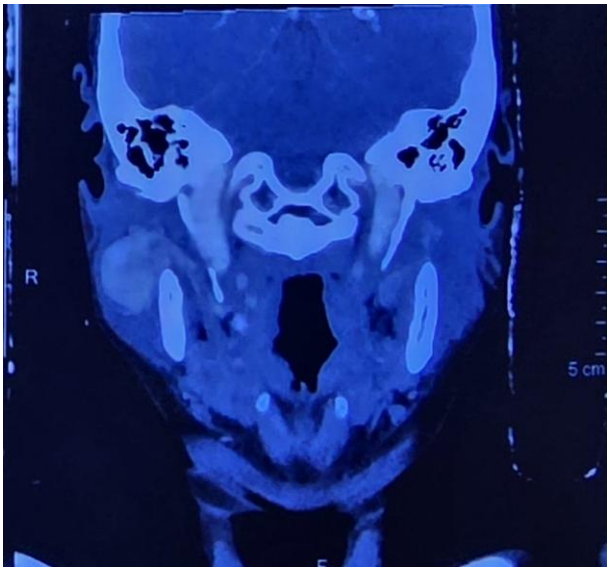

Fig 3: Contrast enhanced computed tomography coronal sections showing a well-defined hypodense lesion arising from deep lobe of right parotid gland

Therapeutic intervention

Due to inconsistent clinical findings and varying reports, the decision was made to proceed with a left total conservative parotidectomy. During surgery, a 2 × 1 cm superficial lobe of the right parotid gland, which appeared normal, was identified and excised. The facial nerve was identified and carefully dissected; however, the buccal and marginal mandibular branches were notably thinned out. All nerve branches were preserved except for buccal and marginal mandibular.

A 4 × 4 cm mass involving the deep lobe of the parotid gland was discovered and excised in multiple segments. The patient had an uneventful postoperative recovery. The surgical drain was removed on the fifth day following surgery, as there was no evidence of fluid accumulation.

Immediately after surgery, the patient exhibited Grade III facial palsy, which showed improvement during the hospital stay and continued to recover post-discharge with dedicated physiotherapy. Histopathological examination (Fig. 4) revealed a well-demarcated proliferation of basaloid cells arranged in trabecular, tubular, and solid patterns. The cells had scant cytoplasm, indistinct boundaries, round-to-oval nuclei, and occasional nucleoli. Peripheral palisading was evident, along with areas showing cystic degeneration. Based on these histological features, a definitive diagnosis of Basal Cell Adenoma was established.

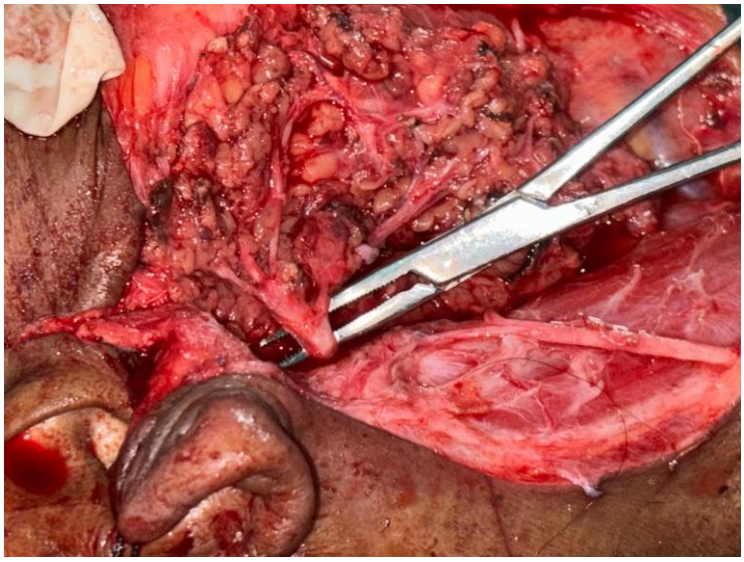

Fig 4: Intraop findings Facial nerve branches after removal of superficial lobe of parotid gland

Follow-up and outcomes

Now, almost 4mnth after surgery, patient remains healthy with Grade 2 Facial nerve palsy.

Fig 5: Follow up after 6 months showing Grade 2 Facial nerve palsy with rt marginal mandibular and buccal paresis

3. DISCUSSION

Basal cell adenoma (BCA), previously referred to as monomorphic adenoma, was recognized as a distinct pathological entity by the World Health Organization in 1991. It accounts for approximately 1–2% of all salivary gland neoplasms. Cytologically, BCAs can resemble both benign and malignant lesions of salivary and non-salivary origin, making diagnosis challenging. They are particularly difficult to distinguish from basal cell adenocarcinoma, necessitating comprehensive histopathological evaluation for accurate diagnosis. Other differential diagnoses include canalicular adenoma, cellular pleomorphic adenoma, solid variant of adenoid cystic carcinoma, and basaloid squamous cell carcinoma.

To date, 42 cases of cytologically diagnosed BCA have been reported, with a false-positive rate of 16.7% [1]. Histologically, BCAs are characterized by basaloid cells with uniform, round nuclei lacking atypia, pale scant cytoplasm, and distinct peripheral palisading. These cells may be arranged in a variety of architectural patterns, including trabecular, tubular, solid, and membranous, often displaying a biphasic cell population without significant mitotic activity [1].

Differentiating BCA from adenocarcinoma is essential due to differences in recurrence rates—6.7% for BCA compared to 16–50% for adenocarcinoma. Additionally, the membranous variant of BCA warrants particular attention owing to its higher

recurrence rate (24%) and a reported 4.3% risk of malignant transformation, often requiring more aggressive surgical intervention than other BCA subtypes [2,3].

Basal cell adenomas (BCAs) infrequently exceed 3 cm in diameter, as evidenced by findings from a large cohort study. In the present case, the lesion measured 24 mm at its greatest dimension. Although BCAs are most frequently diagnosed in individuals during the fifth to seventh decades of life, occurrences in younger patients have also been documented. While the parotid gland remains the most common site, BCAs have been reported in several other anatomical locations including the upper lip, buccal mucosa, lower lip, palate, and nasal septum [3,4].

Although earlier literature reported a higher incidence in females, more recent investigations indicate no significant gender predilection [5].

In a study conducted by Chen et al., plain computed tomography (CT) typically revealed well-circumscribed lesions with homogeneous or heterogeneous density. On contrast-enhanced CT, most lesions exhibited early intense enhancement, though some demonstrated delayed enhancement during the venous phase or lacked enhancement entirely—likely reflecting variations in tumour vascularity. Radiologically, BCAs of the parotid gland frequently mimic benign parotid neoplasms [3].

Furthermore, Chen et al. proposed a classification of BCAs into three types based on their anatomical location.

Within the parotid gland, Chen et al. classified BCAs into three types based on their anatomical positioning: Type I lesions are located near the superficial surface of the gland, Type II are situated adjacent to the retromandibular vein (RMV) within the superficial lobe, and Type III are found in the deep lobe. Among 41 analyzed cases, Type III was the most prevalent (58.5%), exhibited the largest average diameter (2.33 ± 2.72 cm), and was more frequently associated with cystic changes. Collectively, Types II and III constituted 82.93% of cases, suggesting that BCAs may arise in both superficial and deep lobes of the parotid gland. However, no statistically significant relationship was observed between radiological features and histopathological findings [3].

Management typically involves surgical excision. Total conservative parotidectomy is preferred over superficial parotidectomy, especially in cases where the tumour lacks a clear capsule or in instances of the membranous subtype, which carries a higher risk of recurrence and malignant transformation. Accordingly, total conservative parotidectomy is generally advocated for all cases of BCA to ensure complete removal and reduce the risk of recurrence [5].

The prognosis for patients with BCA is favorable when appropriate surgical treatment is administered.

The aetiology of basal cell adenoma (BCA) remains contentious. Histopathological studies suggest that it may develop from pre-existing benign parotid lesions. Proposed precursor entities include intercalated duct lesions—particularly in tubular BCAs—along with various myoepithelial proliferations. Some authors view tubular and non-tubular BCAs as part of a continuum, with the latter arising from the former. Congenital forms originating from embryonic salivary tissue have also been reported . In rare cases, pleomorphic adenoma has been implicated: the tumour's epithelial component contains basal cells with reserve-cell properties that, through epithelial–mesenchymal transdifferentiation, can give rise to the basaloid cell population characteristic of BCA.

Basal cell adenomas (BCAs) of the parotid gland typically present as slow-growing, firm, mobile, and painless masses, most often measuring less than 3 cm in diameter. These tumors usually do not involve the overlying skin, and facial nerve function is generally preserved. Intraoperatively, BCAs are commonly located in the superficial portion of the gland and appear as encapsulated, brownish, oval or round nodules . The membranous subtype, however, is often non-encapsulated, multilobular, and multicentric. On gross sectioning, the tumors typically exhibit a solid, homogeneous appearance without necrosis, though occasional cystic variants have been reported.

Cytological and Histological Features

Fine needle aspiration cytology (FNAC) remains a widely used diagnostic tool; however, it cannot reliably distinguish between basal cell adenoma (BCA) and basal cell adenocarcinoma . In some cases, FNAC may yield findings that resemble benign, inflammatory, or cystic lesions, potentially leading to a misdiagnosis. Therefore, definitive diagnosis and accurate subtyping necessitate histopathological examination.

Histologically, BCA is characterized by uniform, basaloid cells—hence the nomenclature. These cells are typically enclosed within a basement membrane-like structure, demarcating them from adjacent connective tissue . The architectural patterns observed in BCA include solid, trabecular, tubular, and membranous configurations, with most cases showing a combination of at least two patterns. Solid BCAs are composed of tightly packed small cells exhibiting peripheral palisading. In the trabecular and tubular types, the tumor cells are arranged in narrow bands and duct-like formations, which can interconnect to form a reticular, jigsaw-like pattern. The membranous subtype is distinguished by cells arranged in a stockade pattern around the periphery and by the presence of a thick, hyalinized basal membrane (28,29).

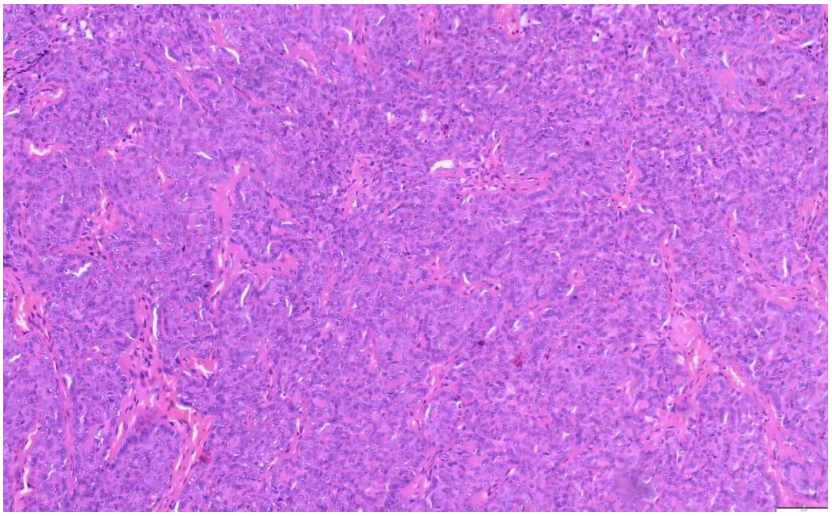

Fig 6: Histopathological image of the tumour

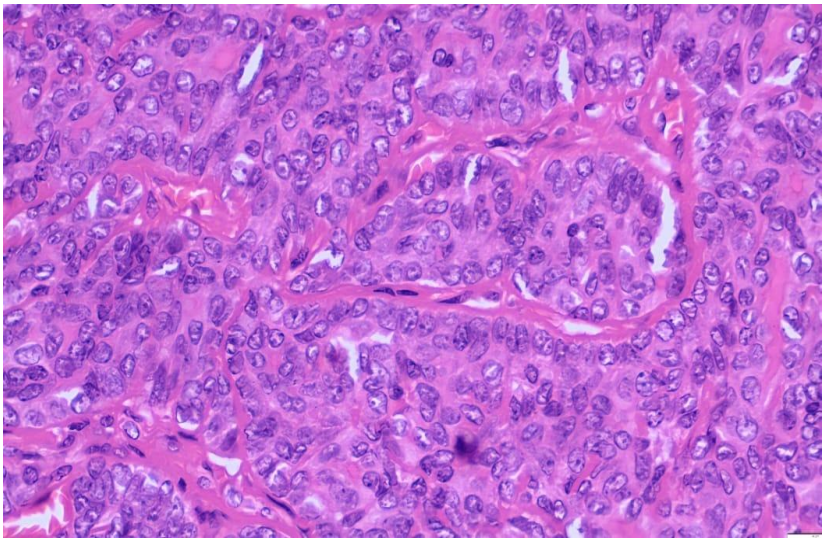

Fig 7: High power view of basal cell adenoma showing clusters of basaloid cells separated by copious amounts of eosinophilic basement membrane like material.

Management and Prognosis

The primary treatment for basal cell adenoma (BCA) of the parotid gland is surgical excision, typically in the form of a superficial or total parotidectomy. Some reports suggest that simple excision with a margin of normal salivary tissue may suffice. However, extracapsular excision is generally preferred to avoid capsular rupture, which could increase the risk of recurrence. Fortunately, recurrence rates are low overall—approximately 2% (30)—except in the membranous subtype, where recurrence rates range from 25% to 37%. This increased recurrence is likely due to multicentricity rather than true local recurrence (31). Notably, up to 4% of membranous BCAs may undergo malignant transformation (32). Therefore, despite its generally favorable prognosis, routine long-term follow-up is recommended.

4. CONCLUSIONS

Basal cell adenomas are uncommon neoplasms, and atypical clinical presentations may complicate accurate diagnosis. Although these tumors are typically benign, the potential for malignant transformation and rare instances of multicentricity underscore the importance of considering them in the differential diagnosis and surgical planning of parotid gland swellings.

Consent for publication

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

Ethical approval

Case Reports are exempted from ethical approval in our institution.

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Author contribution

NH- Conceptualization; Methodology;

Writing - Original Draft.

BR- Visualization; Writing - Review & Editing.

NKS- Supervision; Writing - Review & Editing.

SS- Visualization; Resources.

SBS- Resources.

All authors read and approved the final manuscript.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Availability of data and material- Not applicable.

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