Print ISSN: 2321-6379
Online ISSN: 2321-595X

Original Article

Pleomorphic Adenoma: A Case Series Study

Ajay Kumar[1], Rubeena Anjum[2], Mandeep Kaur[3], Nidhi Khajuria[4], Ettishree Lakhnotra[5], Namita Sepolia[5]

[1]Postgraduate Student, Department of Oral and Maxillofacial Pathology and Oral Microbiology, Jammu, Jammu and Kashmir, India, [2]Professor and Head, Department of Oral and Maxillofacial Pathology and Oral Microbiology, Jammu, Jammu and Kashmir, India, [3]Assistant Professor, Department of Oral and Maxillofacial Pathology and Oral Microbiology, Jammu, Jammu and Kashmir, India, [4]Lecturer, Department of Oral and Maxillofacial Pathology and Oral Microbiology, Jammu, Jammu and Kashmir, India, [5]Tutor, Department of Oral and Maxillofacial Pathology and Oral Microbiology, Jammu, Jammu and Kashmir, India

Abstract

Pleomorphic adenoma (PA) is the most common of benign salivary gland tumors (80%). It is an epithelial derivation and normally appears as a well circumscribed, benign tumor, which may or may not be encapsulated. PA affects both the major and minor salivary glands and accounts for 40–70% of all tumors. The parotid gland is the most affected major salivary gland. Globally, 13.9–51.4% of all salivary gland tumors arise from an intraoral site, and 34.7–67.1% of them are benign. Usually manifest as a slow progressing asymptomatic swelling. The diagnosis is made by the clinical and histopathological examination. The treatment of PA is surgical excision. Malignant transformation, though rare, has been reported. In this article, we report cases series study of PA with a brief literature review.The average age of the patients (five females) was 33.8 years. The average site of involvement includes a parotid gland 0.4%, a minor salivary gland, and a submandibular gland 0.2%. All the cases were predominantly seen in females.

Key words: Parotid gland, Pleomorphic adenoma, Tumors

INTRODUCTION

Pleomorphic adenoma (PA), also referred to as a benign mixed tumor, is the most prevalent type of salivary gland tumor, making up nearly two-thirds of all salivary gland neoplasms. Mostly, PA is located in the parotid glands (85%), minor salivary glands (10%), and the submandibular glands (5%).[1] It is regarded as the commonly occurring salivary gland tumor.[2] Accounting for 63% of all parotid gland tumors. Most tumors originate in the superficial lobe but, more rarely, these tumors may involve the deep lobe of the parotid gland, growing medially and occupying the parapharyngeal space.[3]

PA is characterized by great histological diversity and myoepithelial cells are considered responsible for production of the extracellular matrix.[4] Its histopathological features show a combination of ductal and myoepithelial elements.

Access this article online

www.ijss-sn.com

Month of Submission : 05-2024
Month of Peer Review : 06-2024
Month of Acceptance : 07-2024
Month of Publishing : 07-2024

This entity affects any age group but is most commonly seen in the 4th to 7th decade of life and has a female predilection. PA is the most common salivary gland tumor found in children. It usually has a typical clinical presentation of a slowly progressing painless swelling in the pre-auricular area with or without facial nerve involvement.[2]

Symptoms are usually rare or insignificant; in fact, in most cases, the only indication is an asymptomatic swelling that slowly grows in the parotid region without affecting the facial nerve, the function of which remains unchanged. Often, the onset of facial nerve deficits, changes in consistency, more rapid growth, and pain are signs of malignant transformation. The histological variety of this tumor, combined with its particular location, increases the difficulty in selecting the best surgical approach to maximize visibility and ensure complete removal of the tumor and reduce morbidity.[3] In this article, we describe five cases of PA and present with brief review of the literature.

METHODS

The specimens examined in this study had been used for pathological diagnosis for treatment determination.

Corresponding Author: Dr. Ajay Kumar, Department of Oral and Maxillofacial Pathology and Oral Microbiology IGGDC, Jammu, Jammu and Kashmir, India.

We obtained comprehensive informed consent from the patients to use the post-diagnosis specimens in this study. This study was carried out after taking approval from institutional ethical committee. Patients were included when they had (I) a PA confirmed by clinical examination and (II) high-quality radiographic images. This study analyzed the PAs in the salivary glands and compared them with the existing literature regarding salivary gland PAs.

RESULTS

The average age of the patients was 33.8 years. The average site of involvement includes parotid gland 0.4%, minor salivary gland 0.4%, and submandibular gland 0.2%. The average size of the tumors was 2.14–2.92 cm. All the cases were predominantly seen in females [Table 1].

Case I

A 36-year-old female patient reported to the department, with a chief complaint of swelling over the left side of her face for 1 year. Swelling was associated with pain. Initially, the swelling was smaller in size which gradually increased to the present size. The patient had dryness of mouth and difficulty in mouth opening. Medical history was non-contributory. Upon extraoral examination, a solitary dome-shaped, oval swelling with a smooth surface was present in the body of the mandible, measuring about 3.5 cm × 2.5 cm, extending from the mouth superior-inferiorly from the infra-auricular region to the angle of the mandible, Anteroposteriorly, it extended from posterior border of the ramus of mandible to anterior border of the sternocleidomastoid muscle. The overlying skin was normal in color and texture. Left submandibular lymph node was palpable non-tender and mobile. Lesion was surgically excised under general anesthesia and mass of about 3.5 × 3.5 cm obtained was send for histopathological examination [Figure 1].

Case II

A 34-year-old female patient reported to the department with a painless swelling on the right side of her face below the ear for 5 months. Swelling was gradual in onset and slow in progression. Initially, it was of pea size and progressive to the present size. Upon extraoral examination, a single firm, non-tender swelling measuring 2.4 × 2.3 cm, extending from below the right ear lobule to the angle of the mandible was seen. Intraoral examination and medical history were unremarkable [Figure 2].

Case III

A 21-year-old female patient reported to the department with swelling on the right submandibular region. The patient was operated on for a similar swelling 2 years back. Upon extraoral examination, a well-defined tender firm swelling measuring 2.5 × 1.7 cm in dimension was seen without any discharge. Medical history was nonsignificant [Figure 3].

Case IV

A 48-year-old female patient reported to the department with swelling in her mouth and upper back region for 2 months. It was sudden in onset and progressive in nature. Upon intraoral examination, the upper third molar palatopharyngeal arch, a reddish mass of 5 × 2 cm in dimension with smooth surface in the upper third molar palatopharyngeal arch was seen [Figure 4].

Case V

A 30-year-old female patient reported to the department with chief complaint of swelling in the buccal mucosa, measuring about 1.2 × 1.2 cm in size, pink reddish in color, soft in consistency, and not fixed to the underlying mucosa [Figure 5].

DISCUSSION

PA was first termed by Willis.[5] Its name is derived from the architectural variability observable under a light.[6] It was previously known by other names such as mixed tumor, enclavoma, branchioma, endothelioma, and enchondroma.[5] Myoepithelial and epithelial cells come together to create this benign mixed tumor. These cells are separated from the surrounding tissues by a fibrous capsule.[7]

Most tumors originate in the superficial lobe, but more rarely, these tumors may involve the deep lobe of the parotid gland, and they may grow medially and involve the parapharyngeal space.[8]

Salivary gland tumors comprise only 1–4% of head-and-neck tumors.[9] Among all salivary gland tumors, PA is the most common, occurring in 60–70% of cases, with 84% in the parotid gland, 8% in the submandibular gland, 0.5% in the sublingual gland, 6.5% in minor salivary glands, and 1% in others. PA of the minor salivary glands occurs in the palate (67.5%), lips (10%), cheeks (5%), tongue (2.5%), and other sites (15%); PA in a lip is relatively rare.[10] In the present study, the most common site was parotid gland followed by minor salivary gland and only one case was of submandibular gland.

PA often manifests as a swelling that grows slowly, is asymptomatic, and does not affect the facial nerve.[3] PA tumors clinically are painless, well-delineated, and covered with normal mucous membrane. Ulcerations can occasionally be seen. Single and movable related nodules are present. In contrast to minor gland tumors, major gland tumors are usually encapsulated. The only effective course of treatment in these situations is the complete excision of the lesion.[11] PAs may occur at any age, but mainly, they

Table 1: Characteristics of the patients with a PA occurring in the parotid gland, submandibular, and palatal minor salivary gland, treated at our institution

S.No.	Age (years)	Gender	Site of involvement	Size	Provisional diagnosis	Histopathological features	Investigations
Case 1	36	Female	Right parotid gland	3.5 × 3.5 cm	Pleomorphic adenoma	Show epithelial and myoepithelial cell proliferation in sheets, glandular proliferation, numerous cystic spaces containing eosinophilic coagulum, fat tissue deposits, and serous acini with ducts.	CECT NECK
Case 2	34	Female	Right parotid gland	2.4 × 2.3 cm	Pleomorphic adenoma	Show epithelial and myoepithelial cells proliferation in sheets, glandular proliferation, numerous cystic spaces containing eosinophilic coagulum, and fat tissue deposits.	CECT NECK
Case 3	21	Female	Right Submandibular gland	2.5 × 1.7 cm	Pleomorphic adenoma	Shows a mixture of glandular epithelium and myoepithelial cells in a myxoid background, epithelial components from numerous duct-like structures lined by cuboidal cells containing eosinophilic coagulum, sheets of keratinizing squamous cells, mucoid chondroid area as well as few hyalinized areas.	USG NECK
Case 4	48	Female	Right palatal minor salivary gland	5 × 2 cm	Pleomorphic adenoma	Shows proliferation of ductal epithelium, chondroid material, ducts containing eosinophilic coagulum, minimal fibrous connective tissue stroma, myxoid areas, mucous cells, and mild hyalinization.	CECT NECK, CEMRI
Case 5	30	Female	Left buccal mucosa	1.2 × 1.2 cm	Neurofibroma	Hypercellular connective tissue stroma with myoepithelial cells and ductal cell proliferation. Numerous ductal spaces are seen lined by cuboidal cells contains eosinophilic coagulum, and myxoid matrix clear cell areas.	USG

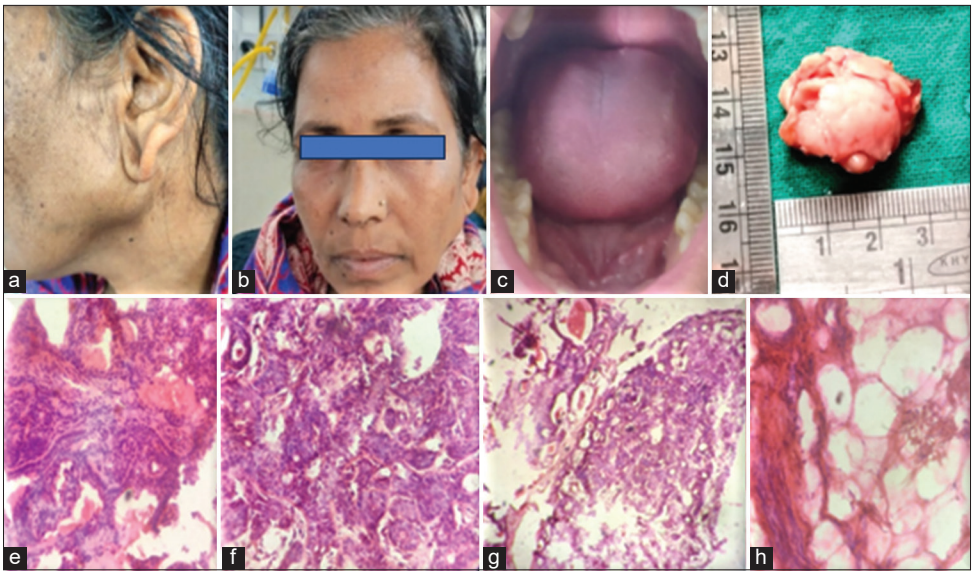

Figure 1: Clinical and histological findings of case I. (a and b) extra-oral localized swelling on the left below ear lobule. (c) intrao-oral photograph. (d) macroscopic image of the resected surgical specimen. A mass with a capsule measuring 3.5 × 3.5 cm. (e-h) H&E staining showing epithelial and myoepithelial cells proliferation in sheets, glandular proliferation, numerous cystic spaces contain eosinophilic coagulum, fat tissue deposits, serous acini with ducts endothelial cells lined blood vessels

affect patients in the third, fourth, fifth, and sixth decades of life. Forty percent of these cases occur in males, while 60% occur in females. The result of our study shows almost similar clinical feature but without any ulceration and with most of the cases in the 3rd and 4th decade of life reported exclusively in females.

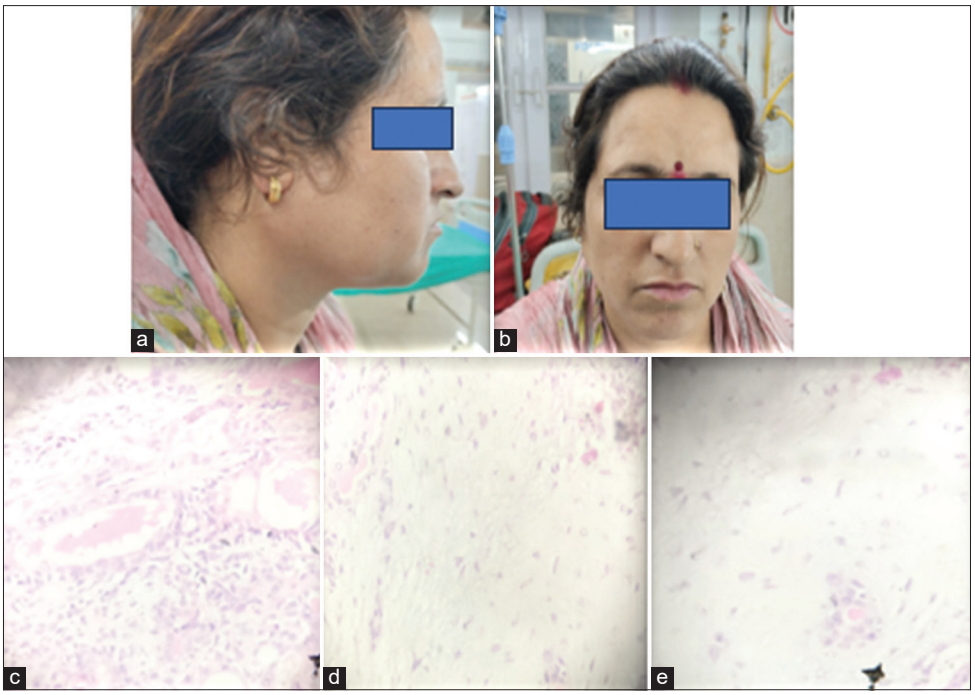

Figure 2: Clinical and histological findings of case II. (a and b) extraoral findings show localized swelling below the right ear lobule to the angle of the mandible. (c-e) H&E staining showing epithelial and myoepithelial cells proliferation in sheets, glandular proliferation, numerous cystic spaces containing eosinophilic coagulum, and myxoid area. Fat tissue deposits

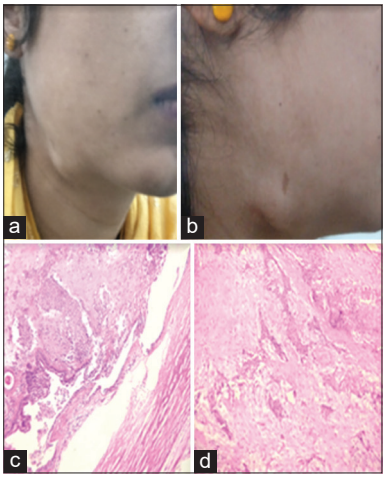

Figure 3: Clinical and histological findings of case III. (a and b) extraoral localized swelling in the submandibular region on the right side. (c and d) shows a mixture of glandular epithelium and myoepithelial cells in a myxoid background, epithelial components form numerous duct-like structures lined by cuboidal cells containing eosinophilic, sheets of keratinizing squamous cells, mucoid chondroid areas as well as few hyalinized areas

The tumor consists of three different cell types: Epithelial, myoepithelial, and mesenchymal. Understanding PA involves recognizing these three components. The epithelium in the loose fibrous stroma of the myxoid, chondroid, or mucoid types exhibits various patterns in the histological presentation of PA. Myoepithelial cells are polygonal in shape and have a light eosinophilic cytoplasm. Microscopic identification is required for a definitive diagnosis of a PA.[12]

Chromosomal alterations

PA has been associated with abnormal karyotypes in up to 70% of cases, with non-random involvement of 8q12, the locus of the PA (PLAG1) gene. However, PLAG1 has also been shown to be activated in cases of PA either with normal karyotypes or with 12q13–15 abnormalities. The PLAG1 protein is a nuclear oncoprotein that functions as a DNA binding transcription factor. Downregulation of PLAG1 target genes, including insulin-like growth factor 2, is likely to play a major role in the genesis of PA. The trisomy 8 is known to be the most frequent numerical deviation found in salivary gland tumors, being present in benign and malignant tumors.[13]

Based on clinicopathological and immunohistochemical features of 60 cases of PA in Brazil, Alves *et al.* reported that the tumor occurred commonly between the 3rd and 5th decades of life, and 37/60 (62%) of the affected patients were women.[4] Results of our study show similar clinical features with most cases in the 3rd and 4th decades of life, exclusively reported in females.

Ellis and Auclair[14] saw epithelial and myoepithelial cells with interspersed areas of mesenchymal differentiation. Epithelial cells typically form duct-like structures and are associated with non-ductal cells of varying shapes and forms. The stromal component can exhibit myxoid,

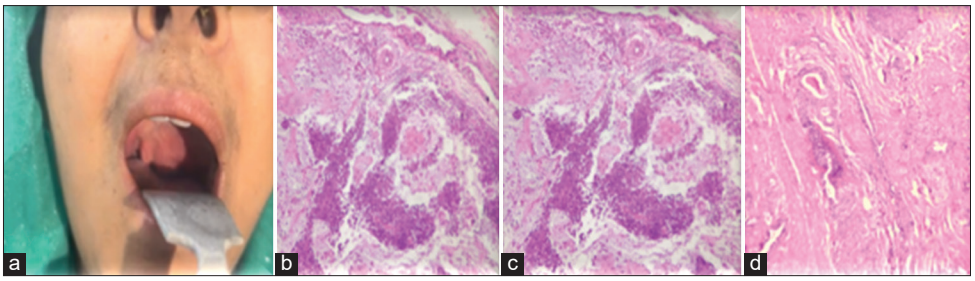

Figure 4: Clinical and histological findings of case IV. (a) Intra-oral findings show localized swelling in the palatal region. (b-d) H&E staining showing-proliferation of ductal epithelium, chondroid material, ducts containing eosinophilic coagulum, minimal fibers connective tissue stroma, myxoid areas, mucous cells, and mild hyalinization

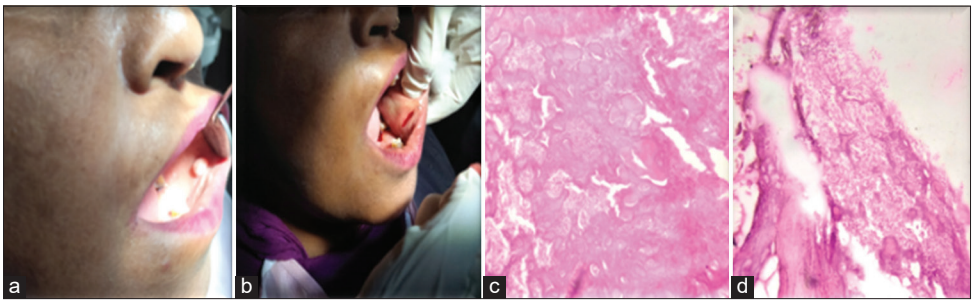

Figure 5: Clinical and histological findings of case V. (a and b) Intraoral localized swelling in the left buccal mucosa region on the left side, surgical excision of the lesion. (c and d) H&E staining showing hypercellular connective tissue with myoepithelial-like cells and ductal cell proliferation. Numerous ductal spaces are seen lined by cuboidal cells and contain eosinophilic coagulum. Myxoid matrix clears cell areas

cartilaginous, hyaline, or osseous differentiation. The stroma appears as a mixture of gland-like epithelium and mesenchymal-like tissue in varying proportions. Our study demonstrated different patterns of this mixture.

In a Brazilian population, De Oliveira *et al.*[15] found that the salivary gland tumors affect females more often, with a male: female ratio of 1:1.5. This ratio is reported as 1:1.6 in benign tumors and 1:1.5 in malignant tumors, in our case series study, most of the cases observed in female patient with all the tumors were benign.

Chidzonga *et al.*[16] also found a higher prevalence of parotid gland PA and lower prevalence in minor and submandibular glands, in our study, PA involved a more frequently parotid gland than submandibular gland, a minor salivary gland in the soft palate, and buccal mucosa.

CONCLUSION

PA is one of the most frequently occurring salivary gland tumors, commonly involving parotid glands but it rarely occurs in minor salivary glands and is especially rare in the buccal mucosa. PAs exhibit a wide range of pathologies and histologies, making it difficult to determine their benign or malignant status based solely on imaging findings or pre-operative biopsy materials alone; in addition, for buccal mucosa PAs, imaging studies and a biopsy may be difficult to perform. Clinicians should consider the possibility of malignancy and post-operative recurrence and perform a resection that includes the capsule and surrounding tissue. In addition, careful follow-up is necessary to monitor for signs of recurrence.

REFERENCES

1. Jain S, Hasan S, Vyas N, Shah N, Dalal S. Pleomorphic adenoma of the parotid gland: Report of a case with review of literature. Ethiop J Health Sci 2015;25:189-94.
2. Shah A, Sayed A, Sayed H, Khutwad G. Pleomorphic adenoma: A case report. Int J Dent Res 2018;3:10-2.
3. Sergi B, Limongelli A, Scarano E, Fetoni AR, Paludetti G. Giant deep lobe parotid gland pleomorphic adenoma involving the parapharyngeal space. Report of three cases and review of the diagnostic and therapeutic approaches. Acta Otorhinolaryngol Ital 2008;28:261-5.
4. Alves FA, Perez DE, Almeida OP, Lopes MA, Kowalski LP. Pleomorphic adenoma of the submandibular gland: Clinicopathological and immunohistochemical features of 60 cases in Brazil. Arch Otolaryngol Head Neck Surg 2002;128:1400-3.
5. Rajendran S, Sivapathasundharam S. Shafer's Textbook of Oral Pathology. New Delhi, India: Elsevier; 2006. p. 209.
6. Byakodi S, Charanthimath S, Hiremath S, Kashalika JJ. Pleomorphic adenoma of palate: A case report. Int J Dent Case Rep 2011;1:36-40.
7. Yousra Z, Saliha C. Pleomorphic adenoma of hard palate: A case report. Pan Afr Med J 2021;38:146.
8. Morita N, Miyata K, Sakamoto T, Wada T. Pleomorphic adenoma in the parapharyngeal space: Report of three cases. J Oral Maxillofac Surg 1995;53:605-10.
9. Patil P, Burde K, Naikmasur VG, Thorawat A. Pleomorphic adenoma of submandibular gland: A case report with review of literature. Dent Res J 2014;11:411-4.

10. Dalati T, Hussein MR. Juvenile pleomorphic adenoma of the cheek: A case report and review of literature. Diagn Pathol 2009;4:32.
11. Kalwaniya DS, Meena R, Kumar D, Tolat A, Arya SV. A review of the current literature on pleomorphic adenoma. Cureus 2023;15:e42311.
12. Zarbo RJ. Salivary gland neoplasia: A review for the practicing pathologist. Mod Pathol 2002;15:298-323.
13. Brito R. Pleomorphic Adenoma of the Minor Salivary Glands: A Case Report and a Review of the Literature. Trabalho Final do Mestrado Integrado em Medicina; 2015.
14. Ellis GL, Auclair PL. Tumors of the salivary glands. In: Atlas of Tumor Pathology. 3rd series. Fascicle 17. Washington, DC: Armed Forces of Institute of Pathology; 1996.
15. De Oliveira FA, Duarte EC, Taveira CT, Máximo AA, de Aquino EC, Alencar RC, *et al*. Salivary gland tumor: A review of 599 cases in a Brazilian population. Head Neck Pathol 2009;3:271-5.
16. Chidzonga MM, Perez VM, Alvarez AL. Pleomorphic adenoma of salivary gland: Clinicopathologic study of 206 cases in Zimbabwe. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 1995;79:747-9.

How to cite this article: Kumar A, Anjum R, Kaur M, Khajuria N, Ettishree, Sepolia N. Pleomorphic Adenoma: A Case Series Study. Int J Sci Stud 2024;12(4):70-75.

Source of Support: Nil, **Conflicts of Interest:** None declared.