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Original Research

Assessment of histopathological variants of 10 ameloblastoma cases: A cross-sectional study

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ABSTRACT:
Aim: The aim of the study was to assess the histopathological variants and clinical presentations of ameloblastoma in a series of 10 diagnosed cases through a cross-sectional analysis. **Materials and methods:** The study included a total of 10 tissue biopsies, comprising formalin-fixed paraffin-embedded (FFPE) tissue blocks from patients with a confirmed diagnosis of ameloblastoma. In addition to archived cases, newly diagnosed cases during the study period were also considered. Relevant patient information, including age, sex, oral anatomical site, and clinical history, was obtained from laboratory request forms. Data analysis was done using SSPS software. **Results:** The study sample consisted of 10 cases. 2 cases (20%) were aged 20 years or below, 5 cases (50%) were between 21 and 40 years, and 3 cases (30%) were aged between 41 and 60 years. Regarding gender, 6 patients (60%) were male, while 4 patients (40%) were female.Clinically, the most common presenting feature was a painless mass, observed in 5 patients (50%). Painful mass was reported in 2 cases (20%), while teeth mobility, displaced teeth, and mobile with displaced teeth were each noted in 1 patient (10%) respectively. No cases presented with an ulcerative mass (0%).Histopathological analysis showed that the follicular type was the most common pattern, observed in 50% of cases. Plexiform type accounted for 20%, while desmoplastic, papilliferous, and acanthomatous types each represented 10% of the cases. The basal cell type was not observed in any case (0%). **Conclusion:** The study concluded that the follicular variant was the most common histopathological type of ameloblastoma, with a painless mass being the predominant clinical presentation.
Keywords: Ameloblastoma, odontogenic, follicular

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INTRODUCTION

Ameloblastoma is a benign neoplasm originating from odontogenic epithelium, primarily resembling enamel organ tissue without hard tissue formation. It represents about 1% of all oral tumors and 9–11% of odontogenic tumors.[1] Typically slow-growing yet locally invasive, it most commonly occurs in individuals in their third to fourth decades of life, with an equal gender distribution.[2] In the Indian population, ameloblastoma accounts for 60.3% of odontogenic tumors, with a mean age of 30.2 years, showing a slight male predilection and a preference for the mandibular molar-ramus area. It is classified into unicystic, multicystic, or solid types, with multicystic forms comprising 86% of cases. Mandibular ameloblastomas can become large, leading to facial asymmetry, tooth displacement, malocclusion, and even pathologic fractures.[3,4]

The understanding of ameloblastoma's etiology has evolved significantly over time. Earlier theories attributed its development to local factors like trauma, inflammation, and irritation from dental procedures. As knowledge of tooth development expanded, ameloblastoma was increasingly linked to remnants of the enamel organ and odontogenic epithelium, with molecular markers such as cytokeratin and vimentin supporting this association.[5] Theories around the bell stage of tooth development, particularly the impaired differentiation of pre-ameloblasts due to absent stratum intermedium, gained ground, further supported by experimental findings in genetically modified mice. At the molecular level, altered

expression of several genes related to tooth development and cellular differentiation—such as FOS, MMP-12, SHH, and CDH13—has been observed in ameloblastoma tissues. Key genetic mutations in the MAPK signaling pathway, especially BRAF V600E, RAS, FGFR2, and SHH pathway components like SMO, have provided strong evidence of molecular dysregulation in ameloblastoma pathogenesis.[6,7]

In terms of classification, the World Health Organization originally categorized ameloblastomas into benign and malignant forms with multiple histological subtypes. However, newer recommendations have simplified and clarified these classifications for improved diagnostic accuracy. The term "solid/multicystic ameloblastoma" is now discouraged in favor of "conventional ameloblastoma," as cystic degeneration is a common feature in most cases. Desmoplastic and plexiform ameloblastomas, previously considered distinct entities, are now viewed as histological variants of conventional ameloblastoma due to overlapping features. Additionally, unicystic ameloblastomas are classified into luminal and mural types, with the mural variant considered closer to conventional ameloblastoma because of its higher recurrence risk. These revised classifications aim to enhance clinical relevance and global consistency in diagnosing and managing ameloblastoma.[8,9,10]

The aim of the study was to assess the histopathological variants and clinical presentations of ameloblastoma in a series of 10 diagnosed cases through a cross-sectional analysis.

MATERIALS AND METHODS

The study included a total of 10 tissue biopsies, comprising formalin-fixed paraffin-embedded (FFPE) tissue blocks from patients with a confirmed diagnosis of ameloblastoma. In addition to archived cases, newly diagnosed cases during the study period were also considered. Relevant patient information, including age, sex, oral anatomical site, and clinical history, was obtained from laboratory request forms.

Tissue blocks were selected using laboratory requisition forms and assigned unique identification numbers to maintain patient anonymity. Each block was serially sectioned at 4.0 microns and stained with hematoxylin and eosin (H&E) for histopathologic examination. Two independent and experienced pathologists, blinded to previous diagnoses and clinical details, reviewed the slides to confirm the diagnosis. In cases of disagreement, a third pathologist provided a decisive opinion. Data analysis was done using SSPS software.

RESULTS

Table 1: Socio-demographic characteristics of patients (N = 10).

Variable	Frequency (n)	Percentage (%)
Age (years)		
≤ 20	2	20
21-40	5	50
41-60	3	30
Gender		
Male	6	60
Female	4	40

The study sample consisted of 10 cases. In terms of age distribution, 2 cases (20%) were aged 20 years or below, 5 cases (50%) were between 21 and 40 years, and 3 cases (30%) were aged between 41 and 60 years. Regarding gender, 6 patients (60%) were male, while 4 patients (40%) were female.

Table 2: Clinical presentation of ameloblastoma patients in this study (N = 10)

Variable	Frequency (n)	Percentage (%)
Painless mass	5	50
Teeth mobility	1	10
Ulcerative mass	0	0
Displaced teeth	1	10
Painful mass	2	20
Mobile and displaced teeth	1	10

Clinically, the most common presenting feature was a painless mass, observed in 5 patients (50%). Painful mass was reported in 2 cases (20%), while teeth mobility, displaced teeth, and mobile with displaced teeth were each noted in 1 patient (10%) respectively. No cases presented with an ulcerative mass (0%).

Table 3: Histopathological patterns of ameloblastoma among the study patients (N = 10).

Variable	Frequency (n)	Percentage (%)
Plexiform	2	20
Desmoplastic	1	10
Follicular	5	50

Papilliferous	1	10
Acanthomatous	1	10
Basal cell type	0	0

Histopathological analysis showed that the follicular type was the most common pattern, observed in 50% of cases. Plexiform type accounted for 20%, while desmoplastic, papilliferous, and acanthomatous types each represented 10% of the cases. The basal cell type was not observed in any case (0%).

DISCUSSION

Ameloblastoma is a benign but locally aggressive odontogenic tumor that primarily affects the jaws, particularly the mandible. It is characterized by slow growth, a high recurrence rate, and varied histopathological patterns, which can influence both clinical behavior and treatment outcomes.[11] Understanding the different histological subtypes is essential for accurate diagnosis, prognosis, and management planning. This cross-sectional study was conducted to assess the histopathological variants of ameloblastoma based on tissue biopsies collected and analyzed at a tertiary referral center, aiming to contribute to the existing knowledge on the distribution and frequency of these variants in a local clinical setting.

In our study comprising 10 cases, 20% of the patients were aged 20 years or below, 50% were between 21 and 40 years, and 30% were between 41 and 60 years. The majority were male (60%), while females constituted 40%. Clinically, the most common presenting feature was a painless mass (50%), followed by a painful mass (20%). Teeth mobility, displaced teeth, and combined mobility with displacement were each observed in 10% of the cases. Notably, no cases presented with an ulcerative mass. Histopathological analysis revealed that the follicular type was the most frequent pattern (50%), followed by the plexiform type (20%), while desmoplastic, papilliferous, and acanthomatous types each accounted for 10% of cases. The basal cell type was not observed in any patient.

Bwambale P et al.[12] aimed to determine the histopathological patterns and biological characteristics of ameloblastoma through a cross-sectional retrospective laboratory-based approach, using 82 formalin-fixed paraffin-embedded tissue blocks from Most patients (66.3%) had presented with painless jaw swelling. The follicular pattern was the most common histological type (39%), followed by the plexiform pattern (12.2%). All cases were benign, with 76.8% being non-recurrent and 23.2% recurrent. Notably, the plexiform pattern was the most frequent among recurrent cases. These findings highlighted a relatively significant recurrence rate and emphasized the importance of close monitoring of patients with the plexiform variant to help prevent disease relapse.

The study by Patsa S et al.[13] aimed to determine the demographic and histopathological variations of ameloblastoma in the Eastern Indian population through a retrospective evaluation of 148 histopathologically confirmed cases retrieved from the Department of Oral Pathology over a seven-year period. Patients were categorized based on gender, age group, lesion site, and histopathological subtype, with findings compared to existing literature. Among the cases, 59.45% were male and 40.55% female, with the majority (101 cases) occurring between the second and fourth decades of life. The mandibular posterior region was the most commonly affected site (48.6%). The solid/multicystic variant was the most prevalent histological type (63.1%), followed by unicystic (21.5%), with one case each of extraosseous and desmoplastic types. In 10% of the cases, a definitive classification was challenging due to an equal presence of follicular and plexiform features. The findings provide valuable baseline data on ameloblastoma patterns in Eastern India, aiding in comparison with studies from other geographic regions.

In the study by Nadaf A et al.[14], a descriptive retrospective analysis was conducted to evaluate the histopathological variants of ameloblastoma. Histopathological reports from a 10-year period were reviewed, and 40 patients were included in the study, revealing a prevalence rate of 7.4%. The patients ranged in age from 20 to 60 years, with the third decade being the most commonly affected age group and a higher incidence observed in males. The histological variants of ameloblastoma were diverse, with follicular, plexiform, and acanthomatous types being the most frequent. Among these, the follicular variant emerged as the most common, and it was predominantly located in the posterior region of the mandible.

A key limitation of our study was the relatively small sample size, which may restrict the generalizability of the findings and reduce the statistical power to detect less common patterns or associations.

CONCLUSION

The study concluded that the follicular variant was the most common histopathological type of ameloblastoma, with a painless mass being the predominant clinical presentation.

REFERENCES

1. Becelli R, Carboni A, Cerulli G, Perugini M, Iannetti G. Mandibular ameloblastoma: Analysis of surgical treatment carried out in 60 patients between 1977 and 1998 J Craniofac Surg. 2002;13:395–400
2. Larsson A, Almerén H. Ameloblastoma of the jaws. An analysis of a consecutive series of all cases reported to the Swedish Cancer Registry during 1958--1971 Acta Pathol Microbiol Scand A. 1978;86A:337–49
3. Shear M, Singh S. Age-standardized incidence rates of ameloblastoma and dentigerous cyst on the

Witwatersrand, South Africa Community Dent Oral Epidemiol. 1978;6:195–9
4. Krishnapillai R, Angadi PV. A clinical, radiographic, and histologic review of 73 cases of ameloblastoma in an Indian population Quintessence Int. 2010;41:e90–100
5. Akintoye SO, Hersh EV (2016). Impact of communication between physicians and dentists on the incidence of jaw osteonecrosis caused by bone anti-resorptives. *Curr Med Res Opin* **32**: 1455–1456.
6. Al-Otaibi O, Khounganian R, Anil S, Rajendran R (2013). Syndecan-1 (CD 138) surface expression marks cell type and differentiation in ameloblastoma, keratocystic odontogenic tumor, and dentigerous cyst. *J Oral Pathol Med* **42**: 186–193.
7. Amzerin M, Fadoukhair Z, Belbaraka R *et al* (2011). Metastatic ameloblastoma responding to combination chemotherapy: case report and review of the literature. *J Med Case Rep* **5**: 491.
8. Celur S., Babu K.S. Plexiform ameloblastoma. Int J Clin Pediatr Dent. 2012;5(1):78. doi: 10.5005/jp-journals-10005-1140.
9. Ochsenius G., Ortega A., Godoy L., Peñafiel C., Escobar E. Odontogenic tumors in Chile: a study of 362 cases. J Oral Pathol Med. 2002;31(7):415–420. doi: 10.1034/j.1600-0714.2002.00073.x.
10. Ladeinde A.L., Ajayi O.F., Ogunlewe M.O., Adeyemo W.L., Arotiba G.T., Bamgbose B.O., et al. Odontogenic tumors: a review of 319 cases in a Nigerian teaching hospital. Oral Surgery. Oral Med Oral Pathol Oral Radiol Endodontol. 2005;99(2):191–195. doi: 10.1016/j.tripleo.2004.08.031.
11. Cestaro G., De Monti M., Alkayyali S., Fasolini F., Salmoiraghi F. Umbilical metastasis mimicking symptomatic hernia: report of a case of sister mary Joseph syndrome. Int J Surg Case Rep. 2017;41:105–106. doi: 10.1016/j.ijscr.2017.10.016
12. Bwambale P, Yahaya JJ, Owor G, Wabinga H. Histopathological patterns and biological characteristics of ameloblastoma: A retrospective cross-sectional study. J Taibah Univ Med Sci. 2021 Nov 3;17(1):96-104. doi: 10.1016/j.jtumed.2021.09.007. PMID: 35140571; PMCID: PMC8801468.
13. Patsa S, Jadav RB, Halder GC, Ray JG, Datta S, Deb T. Demographic and histopathological variation of ameloblastoma: A hospital-based study. J Oral Maxillofac Pathol. 2016 May-Aug;20(2):230-3. doi: 10.4103/0973-029X.185937. PMID: 27601814; PMCID: PMC4989552.
14. Nadaf A, Farooq S, Hakim T. Assessment of Various Histopathological Variants of Ameloblastoma among Kashmiri Population: A Retrospective Study. Ann. Int. Med. Den. Res. 2018; 4(2): DE06-DE08.