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ARTICLE

CLINICAL AND RADIOGRAPHIC EVALUATION OF AMELOBLASTOMA FEATURES: A LONGITUDINAL OBSERVATIONAL STUDY

Evaluación clínica y radiográfica de las características del ameloblastoma: un estudio observacional longitudinal

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ABSTRACT

Objective: This study aimed to describe the radiographic features of ameloblastomas using panoramic radiography; evaluate the radiographic appearance over follow-up, associating with the performed treatment; and analyze the influences of age and lesion size on their progression.

Materials and Methods: Records of patients diagnosed with ameloblastoma. A pilot study with 10% of the sample was conducted for evaluator calibration using the Kappa test; the remaining imaging studies were evaluated using ImageJ® software. Statistical analysis was conducted using the Kruskal-Wallis test followed by the Dunn test.

Results: A total of 23 records were included in the study for data collection and analysis. Predominant radiographic characteristics included radiolucent lesions in the posterior region of the lower jaw 21 (91.30%), unilocular 17 (73.91%), with poorly defined borders 14 (60.86%), associated with retained or impacted teeth 13 (56.52%); common effects on adjacent structures included root resorption 14 (60.86%), tooth displacement 16 (69.56%), and expansion of the bony cortex 16 (69.56%). Resection was the treatment that showed complete lesion regression; age and lesion area did not influence the regression of lesion size after treatments.

Conclusion: Throughout follow-up appointments evaluation, resection treatment stood out as the most effective treatment option for ameloblastoma.

Keywords: *Ameloblastoma; Odontogenic tumors; Panoramic radiography; Treatment outcome; Impacted tooth; Root resorption*

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RESUMEN

Objetivo: Este estudio tuvo como objetivo describir las características radiográficas de los ameloblastomas utilizando radiografía panorámica; evaluar la apariencia radiográfica durante el seguimiento, asociándola con el tratamiento realizado; y analizar las influencias de la edad y el tamaño de la lesión en su progresión.

Materiales y Métodos: Los registros de pacientes diagnosticados con ameloblastoma. Se realizó un estudio piloto con el 10% de la muestra para la calibración del evaluador utilizando la prueba Kappa; los estudios de imagen restantes se evaluaron utilizando el software ImageJ®. El análisis estadístico se realizó utilizando la prueba de Kruskal-Wallis seguida de la prueba de Dunn.

Resultados: Se incluyeron un total de 23 registros en el estudio para la recolección y el análisis de datos. Las características radiográficas predominantes incluyeron lesiones radiolúcidas en la región posterior de la mandíbula inferior 21 (91,3%), uniloculares 17 (73,91%), con bordes mal definidos 14 (60,86%), asociadas con dientes retenidos o impactados 13 (56,52%); Los efectos comunes en las estructuras adyacentes incluyeron reabsorción radicular 14 (60,86%), desplazamiento dental 16 (69,56%) y expansión de la cortical ósea 16 (69,56%). La resección fue el tratamiento que mostró una regresión completa de la lesión; la edad y el área de la lesión no influyeron en la regresión del tamaño de la lesión después de los tratamientos.

Conclusión: A lo largo de las evaluaciones de seguimiento, el tratamiento de resección se destacó como la opción de tratamiento más efectiva para el ameloblastoma.

Palabras clave: *Ameloblastoma; Tumores odontogénicos; Radiografía panorámica; Resultado del tratamiento; Diente impactado; Resorción radicular*

INTRODUCTION

The ameloblastoma is a benign odontogenic tumor of cells resembling ameloblasts and stellate reticulum, exhibiting slow growth but local aggressiveness and a high potential for bone destruction.[1] The World Health Organization (WHO) classification, updated in 2022, includes three subtypes of ameloblastomas: solid conventional ameloblastoma, unicystic ameloblastoma, and peripheral extragnathic ameloblastoma.

The "solid conventional" ameloblastoma subtype is the most prevalent, invading the medullary spaces with a multilocular radiographic appearance.[2] However, unicystic ameloblastomas show cystic formations lined by ameloblastic epithelium, with three subtypes based on epithelial projection: luminal, intraluminal, and mural.[1] Radiographic features of ameloblastomas include unilocular or multilocular osteolytic lesions, characterized by thinning and expansion of the bony cortex, often accompanied by dental root resorption.[3-5]

The panoramic radiography (PR) is widely employed for the presumptive diagnosis and initial management of intraosseous lesions. It is recognized as an effective radiographic tool for well-defined lesions in the posterior mandibular region. However, its precision is somewhat reduced for maxillary lesions situated near the maxillary sinus.[6,7]

According to Brown *et al.*,[8] the incidence of ameloblastomas stands at 0.5 cases per mi-

llion people annually. Treatment strategies are tailored based on clinical, radiographic, and histopathological characteristics. Although unicystic variants are believed to exhibit a lower recurrence rate, a more conservative approach is usually employed.

Typically, aggressive surgical procedures like marginal or segmental resection have been documented; nevertheless, case reports in the literature employing less invasive surgical techniques such as decompression, enucleation, or curettage have demonstrated favorable outcomes.[9,10] The success of ameloblastoma intervention is linked to age, surgical technique, the professional's skill in interpreting imaging studies, and identifying imaging alterations during clinical-radiographic follow-ups.[11]

Therefore, regular follow-up is essential for prognosis and recurrence detection. Although some studies have analyzed the imaging characteristics of ameloblastoma,[3,11,12] to date, no English literature reports have established an association between PRs, treatment type, patient age, and lesion size concerning their progression or regression. Thus, this study aims to describe the imaging characteristics of ameloblastoma, including its variants, using PR.

To analyze the progression of the radiographic aspect over follow-up, establishing correlations with the chosen treatment modality. Also, exploring the potential influences of age and lesion area on the percentage of reduction, progression, or regression of ameloblastomas.

MATERIALS AND METHODS

This study was approved by the Human Research Ethics Committee at the institution where the study was conducted (CAAE: 3220 9520.4.0000.5417). The procedures adhered to the principles of the Declaration of Helsinki.

A dismissal for the Informed Consent Form (ICF) was requested, since this is a retrospective study with data retrieval from the database of individuals who were monitored for over two years at the institution where the research took place.

Patient records and panoramic radiographs included in the study were collected over a period spanning from 1972 to 2022. All included individuals had a minimum individual follow-up period of more than two years at the institution where the research was conducted.

Sample

This is a longitudinal retrospective observational study, using a convenience sample, conducted at a university Stomatology and Radiology clinic through the analysis of physical or electronic records of patients with an ameloblastoma confirmed histopathological diagnosis, having a minimum of two PR exams, from 1972 to 2022.

The exclusion criteria were records with incomplete clinical data, poor quality or with artifacts PR, maxillary ameloblastoma, images of the same ameloblastoma case with an interval of fewer than two years between exams, or cases with prior surgery preventing follow-up.

Data Collection

Collected data included demographic information (age, sex, race, occupation), anamnesis details from physical or electronic records (signs and symptoms, start of the signs and symptoms (months), presumptive diagnoses, prior treatment, histological type, treatment, follow-up (years), and recurrence), and imaging characteristics from PR exams (ameloblastoma location, association of the lesion with a removed or impacted tooth, periphery, radiographic type, and effects on adjacent structures such as

tooth or root displacement, root resorption, presence of bone sclerosis, cortical bone expansion, and cortical bone perforation).

Image Evaluation

The PR exams conducted at the research institution utilized KODAC 8000c (Digital Panoramic and Cephalometric System, Kodak, Trophy SAS, France) and Rotograph Plus MR05 (Villa System Medical, Italy) equipment. All analog PRs were digitized using an HP Scanjet G4050 scanner (11.45 x 25.00, grayscale, 300 ppi, tiff), which was not performed at the research institution. However, for these provided images, it was not possible to obtain information about the image acquisition equipment.

Before evaluating the entire sample of imaging exams, a pilot study with 10% of the sample was conducted for evaluator calibration through the Kappa test and inter- and intra-examiner agreement analysis. Kappa test results were interpreted according to Landis and Koch (1997), where 0-0.40 indicates poor agreement, 0.40-0.59 moderate agreement, 0.60-0.74 good agreement, and 0.75-1.00 excellent agreement.[13] In this preliminary study, the evaluation of PR imaging exams was conducted at a 15-day interval until inter- and intra-examiner agreement exceeded 90%. Following calibration and achieving excellent Kappa agreement, evaluations of the imaging exams were performed with the remaining sample to obtain results.

To prevent fatigue, assessments were conducted with a 30-minute break after every 5 imaging exams. The PRs were analyzed twice by an oral and maxillofacial radiologist and an undergraduate student on a 15" Super VGA flat-screen monitor, using ImageJ® software (version 1.51j8, Wayne Rasband National Institutes of Health, USA). Linear measurements were performed on the images to obtain the total lesion area after calibration using an electronic ruler with known dimensions (centimeters).

Evaluators could use image magnification and adjust brightness and contrast to identify the structures to be evaluated. The area ratio was based on the study by Omani and Adel (2020), determining the straight-line ratio between the greatest height of the lesion and the greatest width perpendicular to that height in radiographic images (Figure 1).[12]

Statistical Analysis

The collected data were tabulated in an electronic spreadsheet using Microsoft Excel (Microsoft Office Professional Plus, 2013). Descriptive statistics were performed to analyze sociodemographic data, anamnesis information, and qualitative imaging characteristics present in the PR exams.

To analyze which treatment led to regression of lesions during follow-up visits, the Kruskal-Wallis test was performed, followed by a comparative analysis using Dunn's test. The Jamovi Project 2020 software (version 1.2) and R Core Team 2019 software (version 3.6) were utilized for the analyses. Results were considered statistically significant when the p-value was less than 0.05.

RESULTS

A total of 48 physical or electronic patient records with ameloblastoma presumptive diagnosis were examined. However, based on eligibility criteria, only 23 records were included in this study for data collection and analysis.

All included patients had a minimum of two panoramic radiographs available for longitudinal evaluation, resulting in a total of 46 panoramic radiographs analyzed. The selection criteria are illustrated in Figure 2.

Table 1 and Table 2 present demographic data, anamnesis information from physical or electronic records, and ameloblastoma radiographic features analyzed in PR exams.

Regarding the evaluation of the lesion's radiographic aspect during follow-ups after the treatment choice, there was a significant regression of lesions when comparing resection and marsupialization treatments ($p<0.05$). Resection, as per the median, showed 100% regression of lesions, while marsupialization exhibited 24% regression, being the treatment with the least regression among the three types compared (Table 3 and Table 4).

Analyzing the potential influences of age and lesion area on the percentage reduc-

Table 1

Demographic Data and Anamnesis Information from Records in the Studied Sample

		N = 23 (%)
Age (years)	7-17	6 (26.05)
	18-30	5 (21.85)
	31-45	6 (26.05)
	46-70	6 (26.05)
Sex	Female	15 (65.21)
	Male	8 (34.78)
Race	White	18 (78.26)
	Not Reported	5 (21.73)
Occupation	Non-manual[a]	12 (52.17)
	Manual[b]	7 (30.43)
	Not Reported	4 (17.39)
Signs and Symptoms	Swelling	12 (52.17)
	Symptomatology	4 (17.39)
	Asymptomatic	3 (13.04)
	Mobility	2 (8.69)
	Paresthesia	1 (4.34)
	Not Reported	1 (4.34)
Start of the Signs and Symptoms (months)	0-6	8 (34.78)
	6-12	3 (13.04)
	12-18	1 (4.34)
	18-24	1 (4.34)
	24-30	1 (4.34)
	Not Reported	9 (39.13)
Presumptive diagnosis	Odontogenic cyst or tumor	12 (52.17)
	Odontogenic tumor	6 (26.08)
	Odontogenic cyst	3 (13.06)
	Not Reported	2 (8.69)
Prior treatment	Enucleation	4 (17.39)
	Marsupialization	3 (13.04)
	Curettage	1 (4.34)
	Medicaments	1 (4.34)

N: Total study population. **NR:** Not reported. **a:** Retired, student. **b:** farmer, banker, teacher, maid, driver.

Table 2

Ameloblastoma radiographic features found in the analyzed population

			N = 23 (%)
Location		Right posterior lower jaw	11 (47.82)
		Left lower jaw	10 (43.47)
		Anterior lower jaw	2 (8.69)
Impacted teeth association		Yes	13 (56.52)
		No	10 (43.47)
Periphery		Poorly defined	14 (60.86)
		Well defined	9 (39.13)
Radiographic type		Unilocular	17 (73.91)
		Multilocular	6 (26.08)
Effects on adjacent structures	Tooth or root displacement	Yes	16 (69.56)
		No	7 (30.43)
	Root resorption	Yes	14 (60.86)
		No	9 (39.13)
	Bone sclerosis	Yes	1 (4.34)
		No	22 (95.65)
	Cortical bone expansion	Yes	16 (69.56)
		No	7 (30.43)
	Cortical bone perforation	Yes	1 (4.34)
		No	22 (95.65)

N: Total study population.

Table 3

Variance analysis using the Kruskal-Wallis test showing the types of treatments for ameloblastomas

Treatment	N = 23 (%)	Median	25%	75%
Enucleation	8	62.52	22.54	100.00
Marsupialization	9	24.73	15.12	55.34
Resection	6	100.00	100.00	100.000

Table 4

Comparison analysis between ameloblastoma treatments performed using the Dunn test

Treatment comparison	Classification difference	Q	p<0.05
Resection *versus* Marsupialization	12.22	3.42	Yes
Resection *versus* Enucleation	6.37	1.74	No
Enucleation *versus* Marsupialization	5.85	1.77	No

tion in the progression or regression of lesions, the correlated treatments were only enucleation and marsupialization.

DISCUSSION

According to the most recent classification of odontogenic tumors by the World Health Organization (WHO), ameloblastoma holds the position of the second most prevalent odontogenic tumor.[1] Regarding its clinical and demographic features, it is noted that it does not show a gender predilection and occurs in a wide age range. Although more common between the ages of 20 and 40, it is rare in children under 10 years old. Typically presents asymptomatically, although it can also manifest as swelling, more commonly in the posterior lower jaw area.[14]

In the present study, as defined by the WHO, a wide age range was affected by the tumor, ranging from 7 to 70 years. The highest percentage of occurrences was observed in patients aged 31 to 70 years. Additionally, in line with a recent study,[14] no cases were recorded in individuals under 7 years old. The swelling was the most recurrent clinical manifestation, showing a predilection for the posterior mandibular region. However, deviating from the WHO classification, we identified prevalence in females, with a female-male ratio of 1.87.

Regarding radiographic characteristics, the results demonstrated that the unilocular radiolucent pattern with poorly defined borders and association with retained or impacted teeth was the most frequent.

Root resorption, tooth displacement, and expansion of the cortical bone were common radiographic findings. These findings align with the results of Ariji *et al.*,[3] who also observed that ameloblastoma lesions tend to present as radiolucent with radiopaque borders, exhibiting a unilocular or multilocular pattern, often associated with non-erupted teeth and root resorption of adjacent teeth. However, it is important to note a discrepancy regarding border definition, as Ariji *et al.*,[3] study highlighted a higher prevalence of well-defined borders differing from the results obtained in this study.

Concerning the histopathological characteristics of ameloblastomas, the conventional multicystic histological type is the most prevalent, comprising about 90% of all cases. Within this category, plexiform and follicular histological patterns are most frequently observed. The follicular type can demonstrate various forms of cytological differentiation, such as granular, basal, and variations of fusiform cells. The granular cell variant represents only 3.5% of ameloblastoma cases but tends toward more aggressive biological behavior, characterized by high recurrence rates and a relative propensity for metastatic spread.[10,15-17] This study found that the conventional histological type was present in the majority of studied patients, as described in the literature, albeit in a much smaller proportion.[10,16]

The treatment of ameloblastoma involves surgical intervention, varying based on the tumor type (radiographically and histologically) and clinical manifestation. The choice between conservative or radical approaches is made considering the individual characteristics of each case.[18] In this study, it was observed that 39.13% and 34.78% of individuals underwent conservative approaches to marsupialization and enucleation, respectively, while 26.08% underwent a more radical approach, involving partial mandibular resection.

Through the comparative analysis of these two methods, it became evident that the radical approach resulted in lower rates of lesion progression. Radical treatment is

associated with a considerable reduction in ameloblastoma recurrence rates, in line with previous study results.[10,19]

It is known that conventional multicystic ameloblastomas have higher recurrence rates compared to unicystic ones. For these cases, the preferred approach involves segmental resection with a 1 cm margin to the bone, also encompassing soft tissue margins.[20,21] In our study, approximately one-third of the total sample showed lesion recurrence. However, it is important to note that we did not distinguish specific histological types of ameloblastomas concerning the applied treatments. The selection of the treatment technique should also consider the patient's quality of life and any underlying medical conditions. Thus, in some cases, a conservative approach to ameloblastoma, combined with annual monitoring for 10 years, may be an option compared to more aggressive resection procedures.[21,22]

Despite our findings favoring the radical treatment approach for ameloblastomas, careful consideration of various factors, including patient age, is crucial. When examining the relationship between age and the percentage reduction in lesion regression after treatment, our focus was specifically on enucleation and marsupialization interventions, as resection demonstrated 100% rates of lesion regression. In this study, it was found that just over a quarter of patients were in the 7 to 17 age group, while the majority of the sample was in the adult age range, between 18 and 70 years. However, our results did not show statistical relevance in the relationship between age and regression in lesion size. In situations involving children, a more conservative approach may be preferable to avoid impacts on facial growth and prevent potential psychological, functional, and aesthetic effects after surgery. In this context, conservative treatment, such as marsupialization or enucleation, combined with adjunctive treatments using Carnoy's solution, may present itself as a viable alternative.[16,23]

Analyzing the relationship between the initial lesion area and the percentage reduction achieved after treatment, it became evident that the larger the initial lesion dimension, the lower the reduction rate obtained. This observation suggests that a less favorable prognosis after treatment is associated with larger initial lesions. Additionally, according to a study, a negative prognosis for unicystic ameloblastomas may be associated with root resorption, perforation of the bony cortex, or the identification of a histopathological mural subtype. These conditions have the potential to result in unfavorable outcomes when a conservative treatment approach is chosen.[15,17] However, in this study, the initial lesion area did not show statistical significance in the reduction of lesions after treatment.

This study presents some limitations that should be considered when interpreting the results. First, in the evaluation of the treatments applied, no differentiation was made between conventional and unicystic histological types of ameloblastoma. This represents an important limitation, as the conventional type generally exhibits more aggressive biological behavior compared to the unicystic type, in addition to distinct radiographic characteristics, a higher risk of recurrence, and a worse prognosis. Second, due to the retrospective design of the study, a considerable amount of clinical and imaging data from physical or electronic records was unavailable, which may have influenced the analysis and interpretation of the results.

Another limitation relates to the imaging modality used. Radiographic assessment was performed exclusively using panoramic

radiographs. Although panoramic imaging is widely used in routine clinical practice and for initial and longitudinal evaluation of jaw lesions, it has inherent limitations in the detailed assessment of cortical bone integrity, soft tissue extension, and precise characterization of features such as multilocularity. The absence of standardized three-dimensional imaging, such as cone-beam computed tomography, may have restricted a more comprehensive radiographic analysis.

Additionally, the sample size of the database was limited. The sample consisted of all eligible cases available in the institutional database, and no prior statistical power analysis was performed to justify the sample size. Given the relatively small number of cases, we avoided extensive subgroup analyses in order to preserve the statistical validity of the results.

This limitation may affect the generalizability of the findings. Despite these limitations, the present study provides valuable information regarding the most prevalent radiographic characteristics and treatment outcomes of ameloblastoma, contributing to a better understanding of this tumor in a real-world clinical setting. Future studies with larger sample sizes, standardized three-dimensional imaging protocols, and prospective designs are encouraged to further elucidate the relationships among imaging features, histopathological subtypes, and treatment outcomes.

CONCLUSIONS

This study shows that the predominant ameloblastoma radiographic characteristics are radiolucent lesions in the posterior region of the lower jaw, unilocular with poorly defined borders, often associated with impacted teeth. Additionally, the effects on adjacent structures were frequently characterized by root resorption, dental displacement, and expansion of the bony cortex.

Throughout the follow-ups, resection treatment was the most effective option. Patient age and the initial area of the lesions did not show a significant influence on the progression or regression of lesion size after treatments. These findings represent a significant contribution to understanding the characteristics, clinical behavior, and treatment dynamics of ameloblastoma, providing a more comprehensive insight into this tumor.

REFERENCES

1. Vered M, Wright JM. Update from the 5th Edition of the World Health Organization Classification of Head and Neck Tumors: Odontogenic and Maxillofacial Bone Tumours. Head Neck Pathol. 2022;16(1):63-75. https://doi.org/10.1007/s12105-021-01404-7. Epub 2022 Mar 21. PMID: 35312978; PMCID: PMC9019005.
2. Wright JM, Vered M. Update from the 4th Edition of the World Health Organization Classification of Head and Neck Tumours: Odontogenic and Maxillofacial Bone Tumors. Head Neck Pathol. 2017;11(1):68-77. https://doi.org/10.1007/s12105-017-0794-1. PMID: 28247226; PMCID: PMC5340735.
3. Ariji Y, Morita M, Katsumata A, Sugita Y, Naitoh M, Goto M, Izumi M, Kise Y, Shimozato K, Kurita K, Maeda H, Ariji E. Imaging features contributing to the diagnosis of ameloblastomas and keratocystic odontogenic tumours: logistic regression analysis. Dentomaxillofac Radiol. 2011; 40(3):133-40. https://doi.org/10.1259/dmfr/24726112. PMID: 21346078; PMCID: PMC3611454.

4. Kreppel M, Zöller J. Ameloblastoma-Clinical, radiological, and therapeutic findings. Oral Dis. 2018;24(1-2):63-66. https://doi.org/10.1111/odi.12702. PMID: 29480593.
5. Alves DBM, Tuji FM, Alves FA, Rocha AC, Santos-Silva ARD, Vargas PA, Lopes MA. Evaluation of mandibular odontogenic keratocyst and ameloblastoma by panoramic radiograph and computed tomography. Dentomaxillofac Radiol. 2018; 47(7):20170288. https://doi.org/10.1259/dmfr.20170288. Epub 2018 Jun 5. PMID: 29791200; PMCID: PMC6196060.
6. Chuenchompoonut V, Ida M, Honda E, Kurabayashi T, Sasaki T. Accuracy of panoramic radiography in assessing the dimensions of radiolucent jaw lesions with distinct or indistinct borders. Dentomaxillofac Radiol. 2003;32(2):80-6. https://doi.org/10.1259/dmfr/2 9360754.PMID: 12775660.
7. Apajalahti S, Hagström J, Lindqvist C, Suo-malainen A. Computerized tomography findings and recurrence of keratocystic odontogenic tumor of the mandible and maxillofacial region in a series of 46 patients. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2011;111(3):e29-37. https://doi.org/10.1016/j.tripleo.2010.10.010. Epub 2010 Dec 8. PMID: 2114 4778.
8. Brown NA, Betz BL. Ameloblastoma: A Review of Recent Molecular Pathogenetic Discoveries. Biomark Cancer. 2015;7(Suppl 2): 19-24. https://doi.org/10.4137/BIC.S29329. PMID:26483612; PMCID: PMC4597444.
9. Kim SW, Jee YJ, Lee DW, Kim HK. Conservative surgical treatment for ameloblastoma: a report of three cases. J Korean Assoc Oral Maxillofac Surg. 2018;44(5):242-247. https://doi.org/10.5125/jkaoms.2018.44.5.242. Epub 2018 Oct 26. PMID: 30402417; PMCID: PMC6209694.
10. Hendra FN, Natsir Kalla DS, Van Cann EM, de Vet HCW, Helder MN, Forouzanfar T. Radical vs conservative treatment of intraosseous ameloblastoma: Systematic review and meta-analysis. Oral Dis. 2019;25(7):1683-1696. https://doi.org/10.1111/odi.13014. Epub 2019 Jan 1. PMID: 30548549.
11. Mariz BA, Andrade BA, Agostini M, de Almeida OP, Romañach MJ, Jorge J Jr, Vargas PA, Lopes MA, Santos-Silva AR, Rocha AC. Radiographic estimation of the growth rate of initially underdiagnosed ameloblastomas. Med Oral Patol Oral Cir Bucal. 2019;24(4):e468-e472. https://doi.org/10.4317/medoral.23003. PMID: 31232391; PMCID: PMC6667015.
12. Omami G, Adel M. Width-to-length ratio comparison between ameloblastomas and odontogenic keratocysts in the body of the mandible: A preliminary study. Imaging Sci Dent. 2020;50(4):319-322. https://doi.org/10.5624/isd.2020.50.4.319. Epub 2020 Dec 15. PMID: 33409140; PMCID: PMC7758258.
13. Landis JR, Koch GG. The measurement of observer agreement for categorical data. Biometrics. 1977;33(1):159-74. PMID: 843571.
14. Palanisamy JC, Jenzer AC. Ameloblastoma. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2023. PMID:31424749.
15 Eckardt AM, Kokemüller H, Flemming P, Schultze A. Recurrent ameloblastoma following osseous reconstruction--a review of twenty years. J Craniomaxillofac Surg. 2009;37(1):36-41. https://doi.org/10.1016/j.jcms.2008.07.009. Epub 2008 Nov 20. PMID: 19022680.
16 Seintou A, Martinelli-Kläy CP, Lombardi T. Unicystic ameloblastoma in children: systematic review of clinicopathological features and treatment outcomes. Int J Oral Maxillofac Surg. 2014;43(4):405-12. https://doi.org/10.1016/j.ijom.2014.01.003. Epub 2014 Feb 3. PMID: 24503101.
17. Zheng CY, Cao R, Hong WS, Sheng MC, Hu YJ. Marsupialisation for the treatment of unicystic ameloblastoma of the mandible: a long-term fo-llow up of 116 cases. Br J Oral Maxillofac Surg. 2019;57(7):655-662. https://doi.org/10.1016/j.bjoms.2019.06.002. Epub 2019 Jun 21. PMID: 312308 52.
18. Singh T, Wiesenfeld D, Clement J, Chandu A, Nastri A. Ameloblastoma: demographic data and treatment outcomes from Melbourne, Australia. Aust Dent J. 2015;60(1):24-9. https://doi.org/0.1111/adj.12244. PMID: 25329538.
19. Antonoglou GN, Sándor GK. Recurrence rates of intraosseous ameloblastomas of the jaws: a systematic review of conservative versus aggressive treatment approaches and meta-analysis of non-randomized studies. J Craniomaxillofac Surg. 2015 Jan;43(1):149-57. https://doi.org/10.1016/j.jcms.2014.10.027. Epub 2014 Oct 31. PMID: 25465490.
20. Pogrel MA, Montes DM. Is there a role for enucleation in the management of ameloblastoma?

Int J Oral Maxillofac Surg. 2009;38(8):807-12. https://doi.org/10.1016/j.ijom.2009.02.018. Epub 2009 Mar 17. PMID: 19297131.

21. Neagu D, Escuder-de la Torre O, Vázquez-Mahía I, Carral-Roura N, Rubín-Roger G, Penedo-Vázquez Á, Luaces-Rey R, López-Cedrún JL. Surgical management of ameloblastoma. Review of literature. J Clin Exp Dent. 2019;11(1):e70-e75. https://doi.org/10.4317/jced.55452. PMID: 30697397; PMCID: PMC6343988.
22. Hammarfjord O, Roslund J, Abrahamsson P, Nilsson P, Thor A, Magnusson M, Kjeller G, Englesson-Sahlström C, Strandkvist T, Warfvinge G, Krüger-Weiner C. Surgical treatment of recurring ameloblastoma, are there options? Br J Oral Maxillofac Surg. 2013;51(8):762-6. https://doi.org/10.1016/j.bjoms.2013.08.013. Epub 2013 Sep 16. PMID: 24050920.
23. Guo T, Zhang C, Zhou J. Unicystic ameloblastoma in a 9-year-old child treated with a combination of conservative surgery and orthodontic treatment: A case report. Clin Case Rep. 2022 Jan 20;10(1):e05241. https://doi.org/10.1002/ccr3.5241. PMID: 35079382; PMCID: PMC8777162.

CONFLICT OF INTERESTS

The author had no conflict of interest to declare.

ETHICS APPROVAL

This study was approved by the Human Research Ethics Committee (CAAE: 32209520.4.0000.5417). A dismissal for the Informed Consent Form (ICF) was requested since this is a retrospective study with data retrieval from the database.

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