Clinico-Radiological And Histopathological Correlation Of 56 Cases Of Ameloblastoma: A 10 Years Retrospective Analysis

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Abstract

Background- Ameloblastoma is a benign odontogenic tumor that often develops in the jawbone. There have only been a few of studies done on Asians that compare the biological behavior of the several histological types of this tumor based on where they develop.

The goals of this study were to (1) evaluate the prevalence and distribution of jawbone ameloblastoma in the Indian population, and (2) investigate the potential for regional and behavioral differences in ameloblastoma histology.

Materials and Methods: Patients who visited the Department of Oral Medicine and Radiology's outpatient clinic had their medical records and imaging studies examined. Histopathologically verified instances of ameloblastoma were reviewed, together with the clinical and radiological histories of 56 additional cases.

Results: Ages averaged 36.50 years. In most cases, patients reported experiencing edema. The posterior mandible was the typical target of the attacks. In excess of 64% of instances, radiographs revealed a multilocular appearance. Soap bubbles were the most often seen radiographic pattern. Ameloblastoma often took the shape of a plexiform or unicystic tumor. Some cases of desmoplastic ameloblastoma are very aggressive and affect the anterior mandible more often than other sites.

"Keywords: ameloblastoma, clinical features, radiographic features, histological correlation"

INTRODUCTION:

Ameloblastoma is defined as a "usually unicentric, nonfunctional, intermittent in development, anatomically benign, and clinically persistent tumor" (Robinson). Jaw tumors called odontogenic tumors are usually harmless growths. Possible sites of origin for ameloblastoma include the finish organ, Hertwig's or Malassez' epithelial sheet, "the coating of an odontogenic pimple (especially a dentigerous growth), the basal cells of the oral mucosa, heterotopic epithelial from other parts of the body (perhaps the pituitary"), and others. About one percent of all oral cancers are of this kind, making it the least common form of this malignancy. There is a lot of weakness in the jaw, especially where the teeth meet the ramus. Some cancers are classified into descriptive categories based on their histological appearance; they include follicular, plexiform, desmoplastic, acathomatous, granular, basal cell, unicystic, fringe ameloblastoma, and others.[1,2,3]

MATERIALS AND METHOD-

The radiography records of 56 patients at ACPM Dental College, Dhule, were reviewed for ameloblastoma between 2006 and 2015, and the results were confirmed by histopathology. The results of each patient's physical examination and imaging studies were evaluated. The patient's medical records and images were examined in hindsight. Radiographic panoramic images were provided for all 56 cases. Twelve instances had periapical intraoral radiograph images, and ten had occlusal radiograph images. In 5 instances, CT cone-rays were used.

The clinical Performa contains a complete history of the patient, including all pertinent medical and imaging data. We looked at the correlations between clinical parameters such gender, age, site swelling and facial asymmetry, discomfort, pain with a non-healing ulcer, egg shell breaking, tooth movement, tooth loss, and vestibular obliteration. Internal

structure, root resorption type, clearly defined corticated borders, tooth displacement/impact, cortical perforation/expansion, and influence on inferior alveolar nerve canal are all radiographic parameters.

The relationship between histological characteristics and geographic location and biological activity was examined. Standard biological parameters from reference works and textbooks like Reicharts and White and Pharaoh were taken into account. Histological classification of ameloblastoma identifies six distinct types: follicular, acanthomatous, granular cell, basal cell, desmoplastic, and plexiform. Tumors may be aggressive or passive, and there can be a wide range of histological variances that indicate different biological behaviors.

Patient demographics-

Over the course of the study's 10-year duration, histopathologists identified 56 instances of ameloblastoma. At the time of first medical evaluation, the ages of the patients ranged from 12 to 62, with the average being 36 and a half. Aesthetically disfiguring facial swelling was the primary complaint of 49 patients, while facial edema with discomfort was recorded by 5 individuals. There were three examples of painful, nonhealing ulcers.

Anatomic location of lesions-

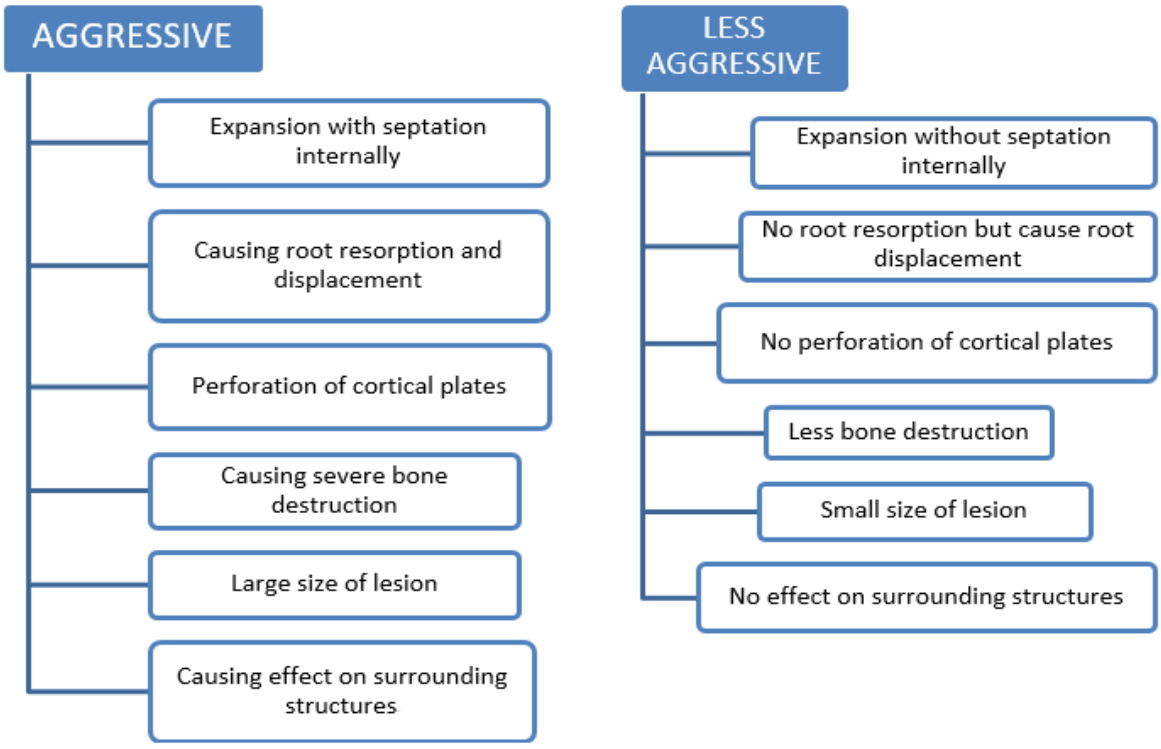
In 14 cases, the tumor spread to the front of the mandible; in 40 cases, it spread to the front and back of both jaws; and in 2 cases, it spread solely to the maxilla. The whole mandibular region was utilized: the body, ramus, tip of mandible, symphysis, and parasymphysis. Of the maxillary instances, two included the premolar-molar region. Fifty-three of the cases in the current investigation had unilateral presentation, while three of the instances crossed the midline. Nearly one-third of eggs had a cracking shell. Missing teeth were linked to 17 instances, and mobility was present in 23. Of the 56 instances examined, obliteration of the vestibular system was seen in 42.

Radiographic analysis of the lesion-

Twenty of the cases evaluated exhibit just unilocular radiolucency, whereas 36 exhibit both multilocular and unilocular radiolucency. Fourteen out of the fifteen examples had a clear corticated edge. The boundaries of the other 42 were less clear. Ten of the instances had a honey comb look, twenty-three had a soap bubble pattern, and three had a spider web appearance. The root apex resorbed in 38 of the instances, which is indicative of a benign condition with an aggressive development pattern. Knife-edge root resorption was seen in 28 instances, while multiplanar root resorption was seen in 10 cases. Lesions may displace teeth or induce impaction of teeth that have yet to erupt. There were 13 occurrences of tooth displacement and 21 cases of impacted teeth. Expansion or perforation of the cortex indicates a locally aggressive benign lesion in cortical alterations. Cortical plates were perforated in 46 of the instances. Forty-three of the 53 lesions enlarged the alveolar process bucco-lingually. The inferior alveolar nerve canal was displaced downhill in 12 instances and was destroyed in 15 others.

"ANALYSIS OF HISTOLOGICAL CORRELATION WITH SITE AND BIOLOGICAL BEHAVIOUR-

According to Diagnostic Imaging of the Jaws– by Langland and Langlais,



“Some of the various subtypes of aggressive ameloblastoma include follicular, plexiform, acanthomatous, granular cell, desmoplastic, basal cell, unicystic, and peripheral ameloblastoma.” In thirteen cases, histology confirmed follicular ameloblastoma, with six of those cases being very aggressive. A total of 16 cases of plexiform ameloblastoma were found, with 11 of those cases being very aggressive. Four cases of desmoplastic and four cases of acanthomatous ameloblastomas were found to be aggressive. Of the 21 people diagnosed with unicystic ameloblastoma, 9 were considered to be very aggressive.

DISCUSSION-

In this case series, we analyze the different clinical, radiological, and histological manifestations of ameloblastoma [Table 1]. When compared to previous publications and research on ameloblastoma, this study provides new information and differs in many significant ways. Clinical manifestation occurred at a mean age of 36.5 years. The highest occurrence occurred between the ages of 30 and 50. In line with the findings of Reichart and Philipsen, the average age at first presentation was 35.9 years.[4,5] Waldron and El-study, Mofty's which indicated a 1.2:1 ratio of male to female malignancies, was consistent with this conclusion. 4,6 According to our findings, the posterior mandible was the most common site for ameloblastoma, followed by the anterior mandible (25.4%) and the posterior maxilla (3.5%).[4,6,7].

Regarding the anatomic place of occurrence, ameloblastoma prefers the mandible, whereas maxillary lesions are seen less often in the literature. According to the research of Ladeinde et al., ameloblastoma tumors tend to form toward the back of the jaw (premolar-molar region).[6,7] In 80.35 percent of the people we studied, edema and facial asymmetry were present. About nine percent of patients also had discomfort with swelling, and about five percent of patients experienced pain with a non-healing ulcer. Most patients in our research had swelling, and many also experienced discomfort, facial deformities, and a non-healing extraction socket. The majority of our patients showed just gradually expanding edema, which was different from what was seen in the previously published literature.

Our investigation found that 64.28 percent of patients had multilocular radiolucency with well delineated corticated edges. Contrast these results with a research done by Kim et al. in which they found that 59.2% of tumors (42 of the 71 studied) were unilocular with a clear boundary. The majority of the soap bubble-like interior structures mentioned in our study's 56 examples. Root resorption, both knife-edge and multiplanar, is often seen in patients with ameloblastomas. Root resorption was seen in 67.85% of the cases in our research, with knife-edge root resorption being the most common kind (48.21%) and multiplanar root resorption coming in second (19.6%). Contrary to what Ogunsalu et al. observed, we discovered 66.4% of instances involving root resorption.[5-7]

“Tooth displacement, embedded teeth, cortical perforation and growth, and the displacement or disappearance of the inferior alveolar canal are” among issues that may be brought on by ameloblastomas.[6,7]. Our radiography analysis revealed that 23.21 percent of patients had displaced teeth (either inferiorly, superiorly, or laterally). The results of this research showed that the cortical plate expanded in 92.8% of instances and perforated in 82.1% of cases. Fourty-eight percent of the cases included disruptions in neurovascular bundles. Radiographically, the lesions appear as broad, radiolucent shadows, and are accompanied by cortical atrophy in the buccal-lingual dimension. Multilocular cystic lesions, often described as "soap bubble" or "honeycomb," are the norm. Infrequently, conventional radiographs will show unilocular ameloblastomas, which look like dentigerous cysts or odontogenic keratocysts. Ameloblastoma radiographic presentation varies across tumor types. It is common for CBCT to be useful in identifying the size, location, and depth of a lesion as well as its impact on surrounding soft tissues.[1,4,6]

Our study was to determine whether there was any correlation between histological features, geographical location, and biological activity. There were 35.7% instances of unicystic ameloblastoma, 28.5% of plexiform, 23.2% of follicular, 7.14& of desmoplastic, and 3.57& of acanthomatous ameloblastoma. In our study, unicystic ameloblastoma was the most common histologic variant. Adebiyi et al. discovered that follicular ameloblastoma was the most common kind, hence these results seemed at odds with their work. Greater than at less aggressive locations, unicystic ameloblastoma most often affects the posterior area of the jaw.[4] It has been determined that the maxilla is aggressive in at least one example. Biologically, follicular ameloblastoma of the mandible's posterior area behaves similarly. More aggressive plexiform ameloblastomas tend to develop in the posterior area of the mandible. The aggressive form of desmoplastic ameloblastoma may primarily affect the front of the mandible. If it spreads to the maxillary area, where it might perforate the maxillary sinus wall, it becomes more aggressive. The affected area had developed an ulcer. Breakdown of the protective cortical barriers in the mouth (the buccal and lingual membranes). Based on my findings, acanthomatous ameloblastoma affects 3.5% of the population and has the ability to aggressively cross the midline when situated in the mandible.

CONCLUSION-

The biochemical activity of ameloblastoma is currently not well enough understood for us to make a conclusive judgment. Considering the modest size of our sample, I believe that further research is required before drawing any definitive conclusions. This allows for the possibility of a meta-analysis to determine which histological variation is more prevalent in a certain area. Decisions on treatments can be made with more precision.

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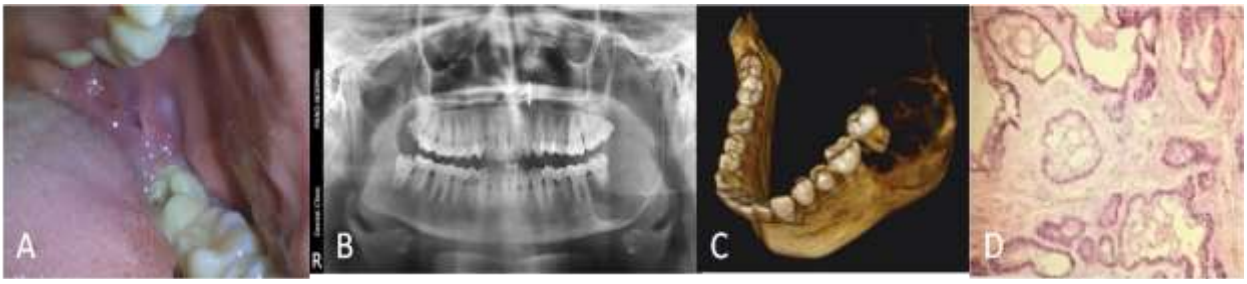
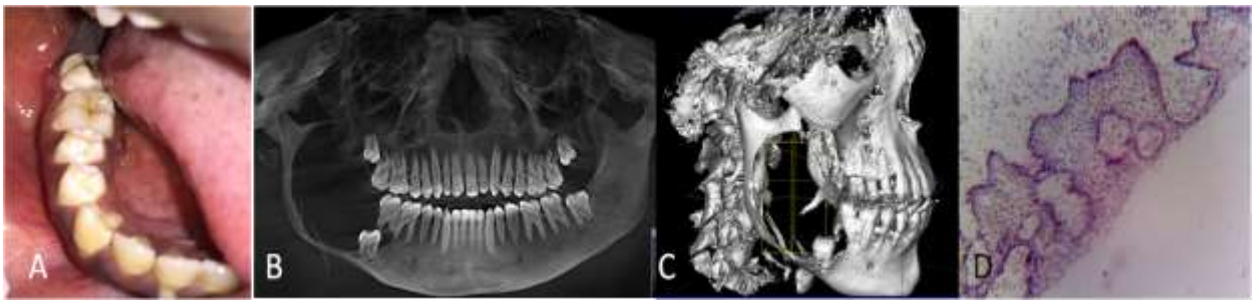


"FIG-1: (**A**) is showing unhealed extraction socket."
(**B**) Radial radiolucency of the body, angle, and ramus of the left mandible is seen on this OPG. Sharpened resorption of the root tip at 37.
(**C**). The CBCT scan shows a destructive osteolytic lesion in the mandibular area on the patient's left side.
(**D**). Ameloblastoma of the follicle, as seen under the microscope.



"FIG-2: (**A**) Slight vestibular obliteration."
(**B**) Unilocular radiolucency affecting the body, angle, and ramus of the right mandible is shown in this panoramic CBCT image. Impacted mandibular third molar extruded downward. Sharpened root resorption using a knife
(**C**). The CBCT scan reveals bone loss and cortical perforation caused by an osteolytic lesion in the right mandibular area.
(**D**). Unicystic plexiform ameloblastoma as seen on histopathology slides.

"TABLE-1

CLINICAL FEATURES	RESULT OF STUDY
GENDER	48.2% FEMALES 51.7% MALES
AGE	36.5 YEARS
SITE	3.5%IN POSTERIOR MAXILLA 25% IN ANTERIOR MANDIBLE 71.4% IN POSTERIOR MANDIBLE
SWELLING AND FACIAL ASSYMETRY	80.35%
PAIN	8.9%
PAIN WITH NON HEALING ULCER	5.3%
EGG SHELL CRACKLING	62.5%
MOBILITY OF TEETH	41%
MISSING TEETH	30.3%
VESTIBULAR OBLITERATION	75%

TABLE-2

RADIOGRAPHIC FEATURES	RESULTS OF THE STUDY
Internal structure	35.71% unilocular 64.28% multilocular
Type of root resorption	67.85% total 48.21% knife edge 19.6% multiplanar
Well defined corticated margins	35.7%
Displacement and impaction of teeth	23.21% displacement of teeth 37.5% impaction
Cortical perforation	82.1% cases
Cortical expansion	92.8%
Effect on inferior alveolar nerve canal"	48.2%