อะมีโลบลาสโตมาชนิดเดสโมพลาสติก: รายงานผู้ป่วยจำนวน 2 ราย

Desmoplastic Ameloblastoma: A Report of Two Cases

ศศิธร ก้อนจันทร์เทศ[1], ณัชพล จมูศรี[2]
[1]โรงพยาบาลกำแพงเพชร
[2]ภาควิชาชีววิทยาช่องปากและวิทยาการวินิจฉัยโรคช่องปาก คณะทันตแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่
Sasithorn Konchanthes[1], Nutchapon Chamusri[2]
[1]Kamphaeng Phet Hospital
[2]Department of Oral Biology and Diagnostic Sciences, Faculty of Dentistry, Chiang Mai University

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บทคัดย่อ

อะมีโลบลาสโตมาชนิดเดสโมพลาสติกพบได้น้อย โดยพบประมาณร้อยละ 4-13 ของอะมีโลบลาสโตมาทั้งหมด และยังพบว่าอะมีโลบลาสโตมาชนิดเดสโมพลาสติกยังมีความแตกต่างจากอะมีโลบลาสโตมาชนิดอื่น ๆ อย่างมีนัยสำคัญ ทั้งในเรื่องของตำแหน่งที่เกิด ลักษณะทางรังสีวิทยา และลักษณะทางจุลพยาธิวิทยา บทความนี้นำเสนอรายงานกรณีศึกษาผู้ป่วยที่ได้รับการวินิจฉัยเป็นอะมีโลบลาสโตมาชนิดเดสโมพลาสติกในกระดูกขากรรไกรจำนวนสองรายในขากรรไกรบนและขากรรไกรล่าง โดยทั้งสองรายมีอาการสำคัญคือ กระดูกขากรรไกรบวม ไม่ปวด และพบภาพรังสีแพโนรามา มีลักษณะเงาขาวร่วมกับเงาดำ ผู้ป่วยทั้งสองรายได้รับการ

Abstract

Among the ameloblastomas, the desmoplastic variation is a rare variant that accounts for approximately 4–13 %. The desmoplastic ameloblastoma displays significant differences in anatomical sites, radiographic features and histologic appearances from the other ameloblastoma subtypes. We here present two patients with desmoplastic ameloblastomas in the maxilla and the mandible. Clinically, both patients presented with painless swelling of the jaw bone. An ill-defined, mixed radiolucent-radiopaque appearance was evident on panoramic radiographs. The definitive diagnosis of

Corresponding Author:

ณัชพล จมูศรี
ภาควิชาชีววิทยาช่องปากและวิทยาการวินิจฉัยโรคช่องปาก
คณะทันตแพทยศาสตร์ มหาวิทยาลัยเชียงใหม่

Nutchapon Chamusri
Department of Oral Biology and Diagnostic Sciences,
Faculty of Dentistry,
Chiang Mai University, Chiang Mai, 50200, Thailand
E-mail : ***chamusri@outlook.com***

วินิจฉัยทางจุลพยาธิวิทยาว่าเป็นอะมีโลบลาสโตมาชนิดเดสโมพลาสติก ได้รับการรักษาโดยการตัดขากรรไกรออกบางส่วน และติดตามผล โดยไม่พบมีการกลับเป็นซ้ำ

desmoplastic ameloblastomas were achieved by incisional biopsies. Subsequently, partial resection of the maxilla or the mandible were performed. The patients are on routine follow-up. No sign of recurrence was observed.

คำสำคัญ: อะมีโลบลาสโตมาชนิดเดสโมพลาสติก อะมีโลบลาสโตมา เนื้องอกเหตุกำเนิดฟัน

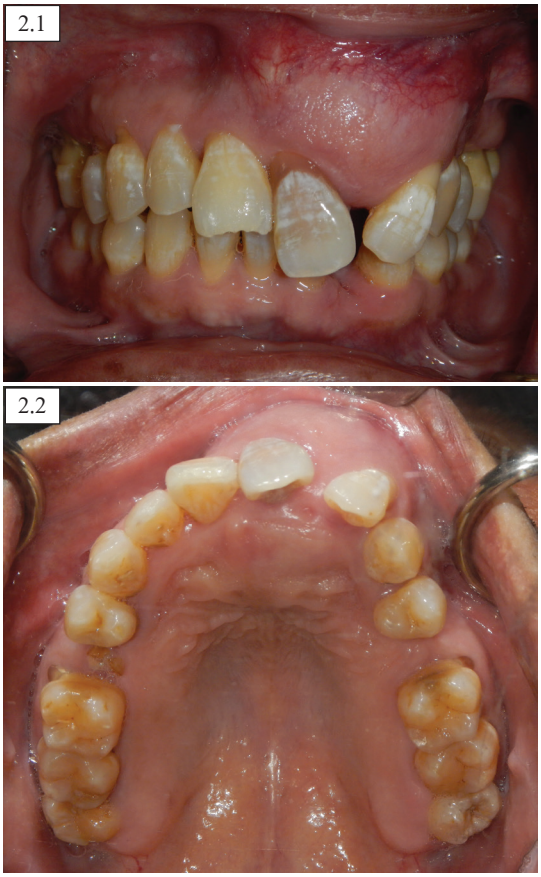
Keywords: desmoplastic ameloblastoma, ameloblastoma, odontogenic tumor

Introduction

Despite having a locally invasive behavior, ameloblastoma is considered a benign neoplasm derived from the odontogenic epithelium. The term "ameloblastoma" includes several clinico-radiographic appearances and different histological subtypes. Desmoplastic ameloblastoma is rare, accounting for approximately 4% to 13% of ameloblastomas.[1,2] Desmoplastic ameloblastoma showed a nearly equal male to female ratio with a high prevalence within the fourth and fifth decades. It also showed the striking tendency to involve the anterior-premolar area of the jaws.[6] This subtype of ameloblastoma occurred with the same frequency in the maxilla and mandible.[3,4,5] Clinically, a painless swelling with buccolingual expansion is the most common presentation. Radiographically, the lesion often presented as mixed radiolucent-radiopaque area with partly ill-defined border, intense calcification, or calcified foci.[7] The lamina dura can also be involved.[3] The radiographic appearance of this lesion may resemble those of other odontogenic and non-odontogenic tumors, such as keratocystic odontogenic tumor, calcifying epithelial odontogenic tumor, odontogenic myxoma, ossifying fibroma and other fibro-osseous lesions, and giant cell lesions.[8] Histologically, scattered odontogenic epithelial nests and strands surrounded by extensively stromal collagenization or desmoplasia are the prominent features of desmoplastic ameloblastoma.[10] Waldron and El Moft described the histologic appearance of desmoplastic ameloblastoma as small ovoid islands and narrow cords of odontogenic epithelium widely separated by dense, moderately cellular, fibrous connective tissue. Although the columnar ameloblast-like cells with hyperchromatic, reverse polarized nuclei may be present at the periphery of the epithelial islands, they are not the dominant feature. Spicules of mature lamellar bone trabeculae have been reported in intimate contact with the tumor, and an invasion has been demonstrated. This histologic finding may indicate the potential for local invasion, and accounts for the diffuse radiographic appearance.[11] Whereas a treatment with enucleation provided a recurrence rate of 21.1%, resection reduces this rate remarkably to 3.1%. The average period until the recurrence occurs was 36.9 months.[1,9] Marx *et al.* recommended surgical resection of at least 1 cm of normal appearing bone beyond the radiographic margin.[12] However, recurrence is still possible. Therefore, the surgical margin of the resected specimen must be thoroughly reviewed by the oral pathologist and warrants a close follow-up in patients for possible recurrence. [12] Recurrence of solid-type ameloblastoma may take place in the first two years, but some recur

รูปที่ 1 *แสดงลักษณะภายนอกช่องปากของผู้ป่วยรายที่ 1 พบการบวมของใบหน้าข้างซ้าย*

Figure 1 *Extraoral image of case 1 showing the swelling on the left side of the face*



รูปที่ 2 *แสดงลักษณะภายในช่องปากของผู้ป่วยรายที่ 1 พบการบวมของขากรรไกรบนข้างซ้าย*
รูป 2.1 แสดงภาพถ่ายด้านหน้า
รูป 2.2 แสดงภาพถ่ายด้านบดเคี้ยว

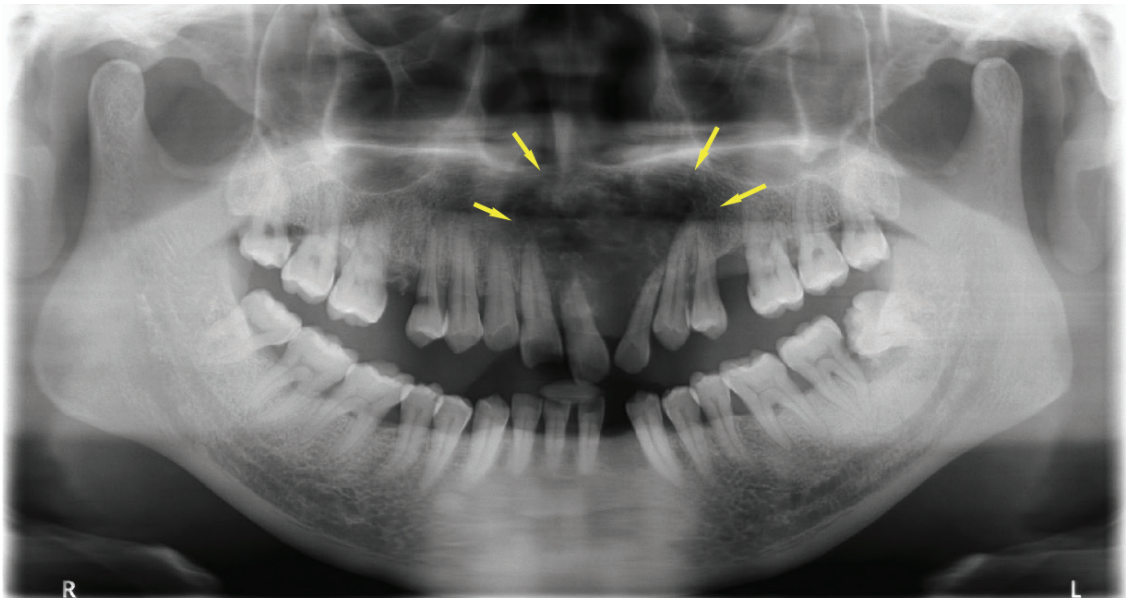
Figure 2 *Intraoral images of case 1 showing the swelling on the left maxilla*
Figure 2.1 Frontal view
Figure 2.2 Occlusal view

after four to five or more years following the initial surgery. Therefore, patients need to be followed up longer.[13]

Case Report 1

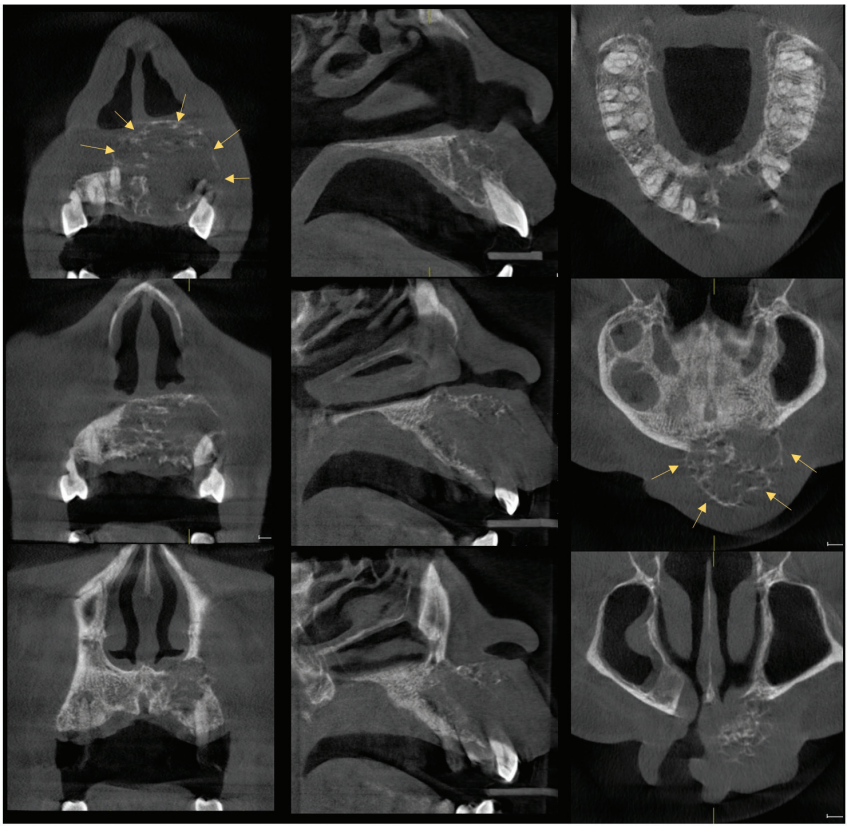
A 53-year-old healthy male was referred to the Faculty of Dentistry, Chiang Mai University with a chief complaint of swelling at the anterior region of the maxilla. The patient provided a history of painless and slow growing of the anterior maxilla for two years.

Extraoral examination revealed a left paranasal swelling extending from the left alar of the nose towards the left angle of the mouth causing facial asymmetry on the left side of the face (Figure 1). Upon intraoral examination, a well-defined swelling of 3 x 3 cm^2 was seen in the upper left anterior maxillary region. The swelling extended from the permanent maxillary right central incisor to the permanent maxillary left canine and obliterated the vestibule (Figure 2). The overlying mucosa was unremarkable. Upon palpation, the swelling was found to be firm, bony hard in consistency, non-tender, non- fluctuant, irreducible, and non-pulsatile. The teeth in the vicinity of the swelling were non-tender to percussion. There was a second degree mobility of the permanent maxillary left central and



รูปที่ 3 *ภาพรังสีพาโนรามาของผู้ป่วยรายที่ 1 แสดงลักษณะรอยโรคโปร่งและทึบรังสีในขากรรไกรบน*

Figure 3 *Panoramic radiograph of case 1 showing mixed radiolucent-radiopaque lesion on the anterior maxilla*



รูปที่ 4 *ภาพรังสีส่วนตัดอาศัยคอมพิวเตอร์ชนิดโคนบีมของผู้ป่วยรายที่ 1 แสดงลักษณะรอยโรคละลายกระดูกบริเวณขากรรไกรบน*

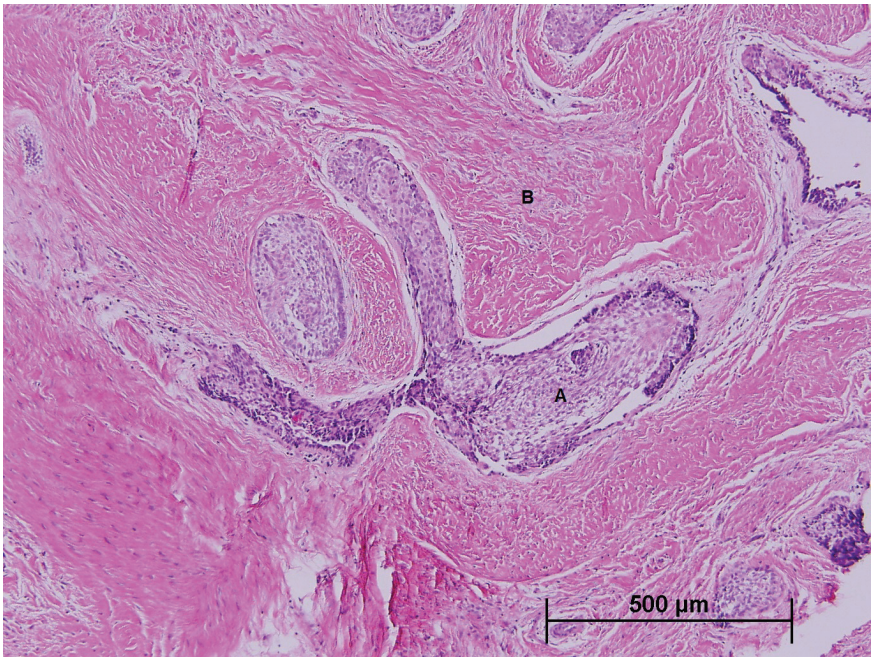
Figure 4 *Cone-beam computerized tomography images of case 1 showing osteolytic lesion with thinning of cortex on the maxilla*

lateral incisors. Upon the electrical pulp vitality testing, all teeth in affected area were vital except the permanent maxillary left central incisor. No cervical lymphadenopathy or fistulae were present.

Radiographically, intraoral periapical, occlusal, and panoramic radiographs (Figure 3) showed partly ill-defined, mixed radiolucent-radiopaque lesion extending from the mesial aspect of the permanent maxillary right lateral incisor to the permanent maxillary left second premolar area with an approximate size of 4 × 3 cm^2. In the vertical dimension, the lesion extended from the alveolar part of the maxilla to the left nasal floor. Displacement of the roots of the permanent maxillary right and left central incisors were evident together with signs of resorption of the permanent maxillary right central incisor's root. Cone beam computerized tomography (CT) (Figure 4) of the lesion showed a multilocular area 3.5 cm medio-laterally, 3 cm supero-inferiorly and 2.5 cm antero-posteriorly. Areas of osteolytic lesion were present.

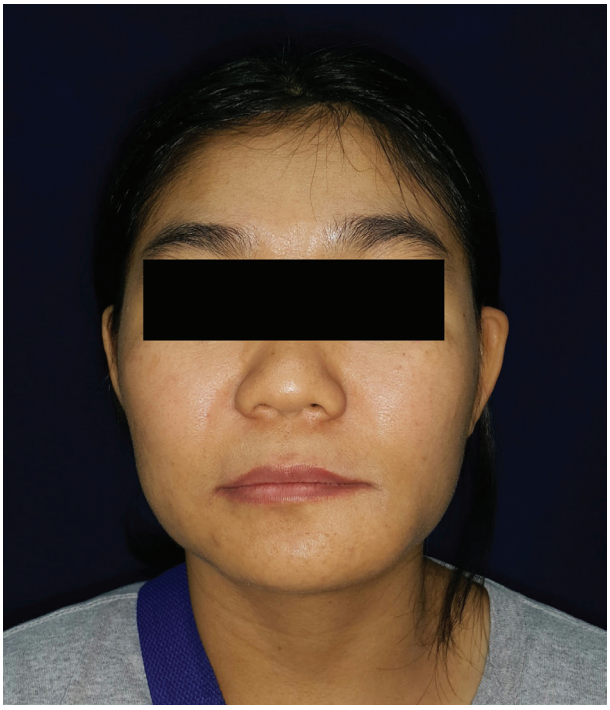
Radiographically, the differential diagnosis includes (1) ameloblastoma (2) ossifying fibroma and (3) calcifying epithelium odontogenic tumor. All laboratory investigations were carried out before the surgical procedure and found to be within normal limits.

The definitive diagnosis was established through an incisional biopsy performed at the extracted socket of the permanent maxillary left central incisor under a local anesthesia. Histopathologically, the specimen showed irregular, bizarre-shaped islands and cords of the odontogenic epithelium surrounded by a densely collagenized stroma. The moderately cellular fibrous connective tissue with abundant thick collagen fibers compressed the odontogenic islands, giving them an 'animal-like' configuration (Figure 5). The histopathologic features were corroborated with those of desmoplastic ameloblastoma.



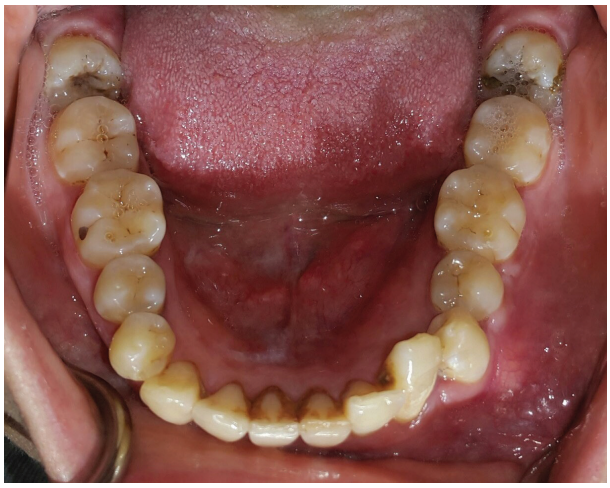
รูปที่ 5 *ลักษณะทางจุลพยาธิวิทยาของรอยโรคในผู้ป่วยรายที่ 1 แสดงเกาะของเยื่อบุผิวเหตุกำเนิดฟัน (A) ล้อมรอบด้วยเนื้อเยื่อพยุงที่มีคอลลาเจนหนาแน่น (B) (ย้อมสีฮีมาท็อกไซลินและอีโอซิน ที่กำลังขยาย 100 เท่า)*

Figure 5 *Histopathologic features of case 1 showing island of odontogenic epithelium (A) surrounded by a densely collagenized stroma (B) (hematoxylin and eosin stain, 100x magnification)*



รูปที่ 6 *แสดงลักษณะภายนอกช่องปากของผู้ป่วยรายที่ 2 พบการบวมบริเวณคางข้างซ้าย*

Figure 6 *Extraoral image of case 2 showing the swelling on the left chin area*



รูปที่ 7 *แสดงลักษณะภายในช่องปากของผู้ป่วยรายที่ 2 พบการบวมของขากรรไกรล่างข้างซ้าย*

Figure 7 *Intraoral image of case 2 showing the swelling on the left mandible*

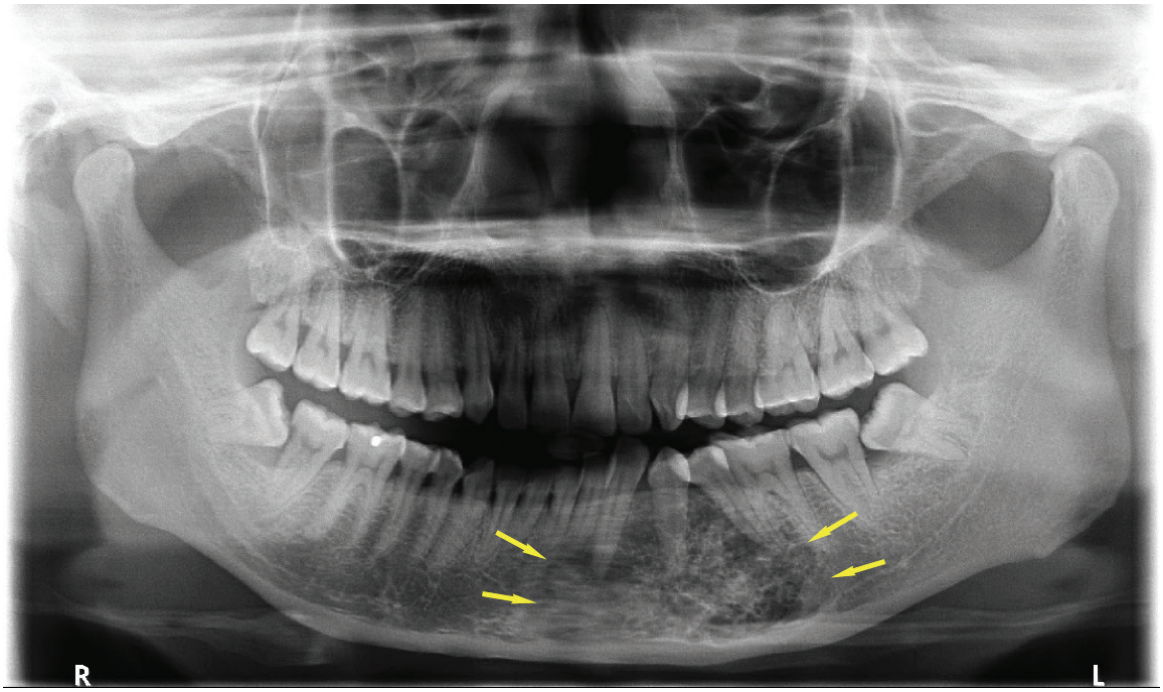
A partial maxillectomy from the area of the permanent maxillary right lateral incisor to the permanent maxillary left second premolar and immediate reconstruction with the left nasolabial flap and surgical stent were performed under general anesthesia. The surgical specimen, consisted of a segment of the maxilla with the lesion and associated teeth, was submitted for histopathologic evaluation. The neoplastic cells were not present at the margins of the specimen. The post-operative period was uneventful. The patient was advised for a routine follow-up and showed no signs of recurrence upon an eight-month follow-up.

Case Report 2

A 30-year-old female was referred to the Faculty of Dentistry, Chiang Mai University with a chief complaint of a swelling in the left chin area for one year. The patient provided a history of a mild swelling on the chin and the size of the swelling gradually increased to what was shown on her first visit. A mild pain and a first degree mobility were reported on the permanent mandibular left first molar for one month.

Upon extraoral examination, a large well-defined, roughly oval-shaped swelling, approximately 5 x 5 cm^2 in size, was seen in the left chin region (Figure 6). The swelling extended supero-inferiorly from the left commissural lip to the lower border of mandible. Normal skin coverage. Upon palpation, the swelling was found to be bony hard in consistency without tenderness.

Intraoral examination showed swelling at the labial sulcus to the alveolar ridge extending from the area of the permanent mandibular left lateral incisor to the permanent mandibular left first molar causing lingual displacement of the permanent mandibular left canine (Figure 7). Tooth mobility was not present.



รูปที่ 8 *ภาพรังสีพาโนรามาของผู้ป่วยรายที่ 2 แสดงลักษณะรอยโรคโปร่งและทึบรังสีในขากรรไกรล่างข้างซ้าย*

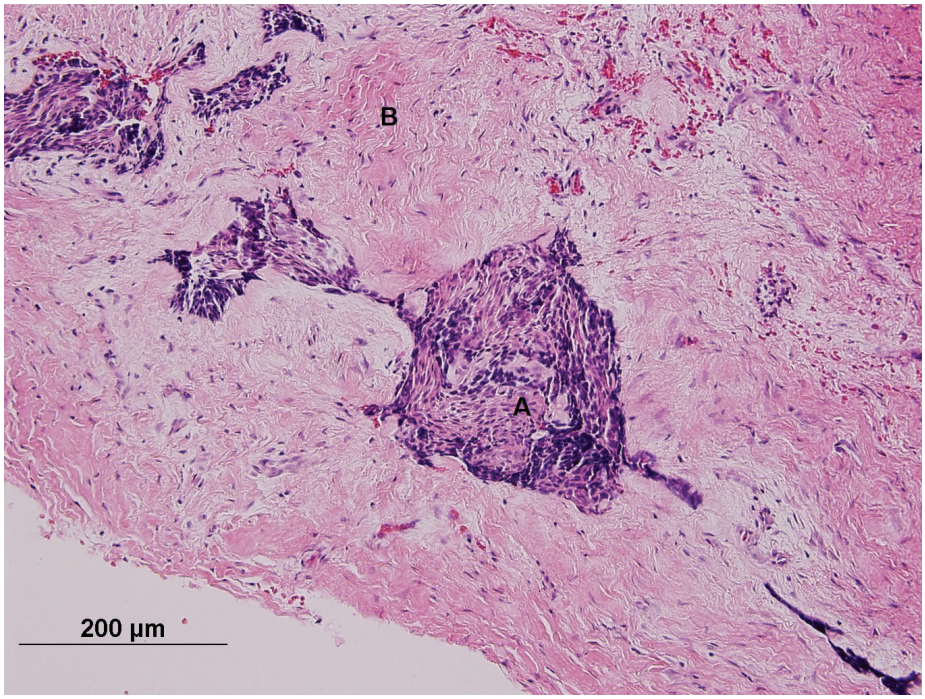
Figure 8 *Panoramic radiograph of case 2 showing mixed radiolucent-radiopaque lesion on the left mandible*

The panoramic radiograph (Figure 8) showed ill-defined mixed radiolucent-radiopaque lesion at the left premolar region of the mandible extending from the alveolar part to the lower border of the mandible causing a displacement of the teeth at the affected area. The lesion extended mediolaterally from the mesial aspect of the permanent mandibular left central incisor to the distal aspect of the permanent mandibular left first molar. Based on the history of slow growth, clinical and radiographic features, a provisional diagnosis of an ameloblastoma, an ossifying fibroma or other fibro-osseous lesions were given.

An incisional biopsy was performed at buccal site of the permanent mandibular right first molar under local anesthesia. Histopathologically, islands and nests of the odontogenic epithelial tumor cells surrounded by an extensive moderately cellular, desmoplastic stroma with an abundance of collagen were observed (Figure 9). Therefore, the definitive diagnosis of a desmoplastic ameloblastoma was made. The patient underwent a partial mandibulectomy extending from the area of the permanent mandibular left second molar to the permanent mandibular right canine and an immediate reconstruction with an iliac bone graft under general anesthesia. The surgical specimen, consisted of a segment of the mandible with the lesion and associated teeth, was submitted for histopathologic evaluation. The neoplastic cells were not present at the margins of the specimen. The postoperative period was uneventful. The patient was advised for routine a follow- up and showed no signs of recurrence upon a three-month follow-up.

Discussion

Desmoplastic ameloblastoma is a rare odontogenic tumor, characterized by marked stromal desmoplasia. It is a benign but locally infiltrative odontogenic epithelial neoplasm, accounting for 4–13% of all



รูปที่ 9 *ลักษณะทางจุลพยาธิวิทยาของรอยโรคในผู้ป่วยรายที่ 2 แสดงเกาะของเยื่อบุผิวเหตุกำเนิดฟัน (A) ล้อมรอบด้วยเนื้อเยื่อพยุงที่มีคอลลาเจนหนาแน่น (B) (ย้อมสีฮีมาท็อกไซลินและอีโอซิน ที่กำลังขยาย 200 เท่า)*

Figure 9 *Histopathologic image of case 2 showing island of odontogenic epithelium (A) surrounded by a densely collagenized stroma (B) (hematoxylin and eosin stain, 200x magnification)*

ameloblastomas.[1,2] Desmoplastic ameloblastoma mostly occurs in the fourth to fifth decades of life with no gender predilection. Males and females are equally affected. More than 70% of the cases are seen in the anterior region of the maxilla, as against the conventional ameloblastomas, which are usually found in the posterior mandibular region.[2] A unique location of desmoplastic ameloblastoma in the anterior maxilla was also shown in our first case.[4,10]

Since desmoplastic ameloblastoma shows specific clinical, radiographic, histologic and biological features, Philipsen and Reichart[14] suggested desmoplastic ameloblastoma as a separate variant of ameloblastomas. In 2005, the world health organization (WHO) classified desmoplastic ameloblatoma as a separate entity of the odontogenic tumors.[14]Radiographically, approximately 50 % of desmoplastic ameloblastomas show mottled and mixed radiolucent-radiopacity with ill-defined margins, making them difficult to differentiate from fibro-osseous lesions. It was hypothesized that this may be due to the infiltrative nature of desmoplastic ameloblastomas into the trabecular bone. Three radiological presentations of desmoplastic ameloblastomas are mentioned in the literature as follows: type I (osteofibrosis type) which has radiolucent as well as radiopaque appearances; type II (radiolucent type) which has a completely radiolucent appearance; and type III (compound type) which has radiolucent as well as radiopaque appearances combined with a large radiolucent change. The type I is the most common pattern of desmoplastic ameloblastomas, while the type III is the least common pattern.[15] The radiographic features of our cases showed mixed radiolucent-radiopacity, making them consistent with the osteofibrosis type.

The definitive diagnosis of desmoplastic ameloblastomas is based on histopathologic evaluation of the biopsied specimens. The usual microscopic features of desmoplastic ameloblastomas are: (1) extensive stromal desmoplasia with abundance of collagen and moderate amount of cellular connective tissue, which is the most consistent and distinguishing feature; (2) islands of different shapes of the epithelial component;(3) cells at the periphery of the epithelial island are usually cuboidal and occasionally hyperchromatic; and (4) the central area of the islands are occupied by whorls of spindle-shaped or squamous epithelial cells.[16] In addition, formation of metaplastic osteoid trabeculae or osteoplasia may be present. A pattern of palisaded peripheral cells of the neoplastic follicles as observed in conventional ameloblastomas is absent.[14] Myxoid changes of the juxtaepithelial stroma are often found. A fibrous capsule is not present corresponding to radiographically poorly defined tumor margins.[1]

Immunohistochemical studies suggested that the desmoplasia of desmoplastic ameloblastomas might be a result of overexpression of transforming growth factor beta (TGF-β), a potent local factor that modulates formation of the extracellular matrix. TGF-β can also influence the synthesis of extracellular matrix proteins involved in support, adhesion, proliferation, migration and differentiation of the tumor cells that may lead to the phenomenon of desmoplasia in desmoplastic ameloblastomas.[17] Alternatively, desmoplasia in desmoplastic ameloblastomas may reflect maturational changes of the stromal connective tissue as this phenomenon is also observed in long persistent tumors. Some authors hypothesized that a combination of desmoplastic ameloblastomas with any other types of solid ameloblastomas, so-called hybrid ameloblastoma, may be a transitional phase in the maturation of a solid multicystic ameloblastoma to the desmoplastic variation.[16]

Desmoplastic ameloblastomas exhibit a more aggressive behavior than other types of the ameloblastoma. This aggressiveness, evidenced by the diffuse radiographic appearance and the histologic finding of bone invasion, may be due to their potential to grow to a large size and the common location of the tumors in the maxilla leading to an early invasion of the adjacent structures.[17] Taken together, the treatment of desmoplastic ameloblastomas should be performed by surgical resection with adequate margins for prevention of recurrences.

The biological behavior particularly recurrences of desmoplastic ameloblastomas remains unclear. According to the WHO classification, it is stated that unicystic, peripheral and possibly desmoplastic ameloblastomas have lower recurrent rates than other ameloblastomas.[14] However, some authors believed that it is premature to indicate a low recurrent rate in desmoplastic ameloblastomas. This is because the radiologic and histologic findings of desmoplastic ameloblastomas show a poor encapsulation or total lack of a capsule. Therefore, further studies on a large series of cases of desmoplastic ameloblastomas with a long-term follow-up are suggested.[4]

Conclusion

Two rare cases of desmoplastic ameloblastomas in the maxilla and mandible are reported. Both cases showed mixed radiopaque-radiolucent radiographic appearances resembling fibro-osseous lesions. Resection of the jaw bone was chosen for treatment based on local aggressiveness of desmoplastic ameloblastomas. Since recurrences may take place in desmoplastic ameloblastomas within 3-4 years postoperatively, a close long-term follow-up for both patients was planned.

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