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Odontogenic myxoma: a case report with recent image modalities

Jae-Duk Kim, Kwang-Won Kim*, Sung-Hoon Lim*

Department of Dentomaxillofacial Radiology, Dental Hospital, Chosun University
**Department of Orthodontics, Dental Hospital, Chosun University*

ABSTRACT

The odontogenic myxoma is an benign, slow growing neoplasm which is of ectomesenchymal origin. This neoplasm occurs almost exclusively in the jaw bones and comprises 0.2% to 17.7% of odontogenic tumors. The odontogenic myxoma may show a wide spectrum of radiographic appearances, unilocular, multilocular radiolucency and a distinct or diffuse border, making the differential diagnosis difficult. We present a case of the odontogenic myxoma in the maxilla with conventional and recent image modalities. Occlusal film revealed a medially extended multilocular lesion with intralesional fine and straight trabeculations from the scalloped margin and buccal expansion and thinning of cortical bone. Computed tomogram revealed lesion showed equivalent density to the muscles in the left maxillary sinus with partial cortical discontinuity of medial wall and the tennis-racket pattern with internal straight trabeculations. MRI revealed intermediate signal intensity on T1 weighted image and high signal intensity on T2 weighted image. In Gd enhanced MR image, the peripheral portions of the lesion were enhanced. ***(Korean J Oral Maxillofac Radiol 2004; 34 : 199-202)***

KEY WORDS : Myxoma; Tomography, X-ray Computed; Magnetic Resonance Imaging; Maxilla

Odontogenic myxoma is defined by the World Health Organization (WHO) as a benign tumor, which is of ectomesenchymal origin and is a locally invasive neoplasm consisting of rounded and angular cells lying in an abundant mucoid stroma.[1] The relative prevalence of this tumor is reported to be 0.2-17.7% of all odontogenic tumours.[2] Myxomas rarely appear in the skeleton and almost exclusively manifest in the jaws.[3,4] Of the myxomas occurring in the jaws, the cases in the non-tooth-bearing areas are few.[3] This tumor may present at any age but is most frequently discovered in the 2nd to 4th decades and occur more frequently in the mandible than in the maxilla.[5]

Radiographically the tumour shows unilocular or multilocular radiolucency and a distinct or diffuse margin.[2-12] These features makes the differential diagnosis difficult from those of other odontogenic or non-odontogenic benign tumours arising in the jaw. Occasionally it may be confused with malignant tumours.[9,10,12,13] Displacement of teeth by the tumor is a relatively common finding, but root resorption is less frequently seen.[9] Expansion of the cortex or distortion of the maxillary sinus wall is common finding.[14]

Generally, a characteristic feature of odontogenic myxoma is known to be a "tennis racquet" appearance on conventional radiographs. The fine straight trabeculations form square or triangular compartments. This typical appearance cannot be observed in all patients with odontogenic myxoma.[2-12]

Recently, CT and MRI features of this tumor have been demonstrated in many case reports.[3,4,13-21] CT is thought to be effective in demonstrating the characteristic bony feature.[14] MRI is able to detect the exact lesional extent and aid in the specific diagnosis of myxoma.[20] In this report, the evaluation with conventional radiograph, CT, and MR images of odontogenic myxoma in the maxilla will be presented.

Case report

A 30-year-old female was referred to a dental hospital affiliated to the university for evaluation of a painless buccal side swelling from the canine to the second molar on her upper left jaw without any specific previous history. Imaging examinations containing conventional radiographs, CT and MR and a biopsy were performed and the lesion was diagnosed as odontogenic myxoma.

Periapical film and panoramic radiograph showed an extensive multilocular radiolucent lesion of the left maxilla

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Correspondence to : Prof. Jae-Duk Kim
Department of Oral and Maxillofacial Radiology, College of Dentistry, Chosun University, 421 Susuk-dong, Dong-gu, Kwangju, Korea
Tel) 82-62-220-3880, Fax) 82-62-227-0270, E-mail) jdakim@chosun.ac.kr

Fig. 1. Panoramic radiograph (A) and periapical film (B) shows an extensive multilocular radiolucent lesion of the left maxilla with internal fine trabeculation. No teeth displacement or no root resorption but loss of lamina duras is recognized.

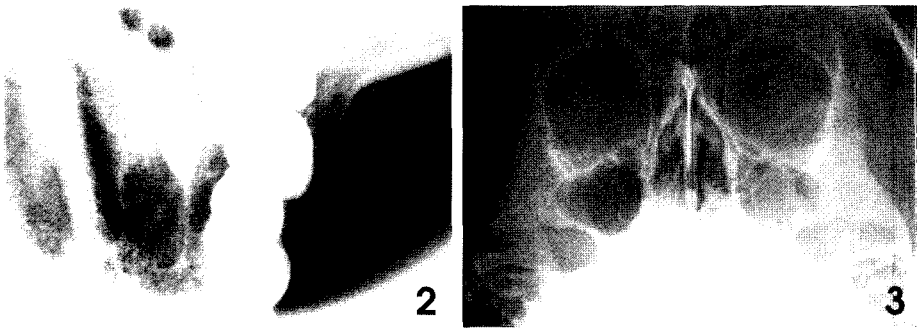

Fig. 2. Occlusal film reveals a medially extended multilocular leson with intralesional fine and straight trabeculations from the scalloped margin. Buccal expansion and thinning of cortical bone is recognized.

Fig. 3. Water's view shows extensive radiopaque area with multilocular internal structure in the left maxillary sinus.

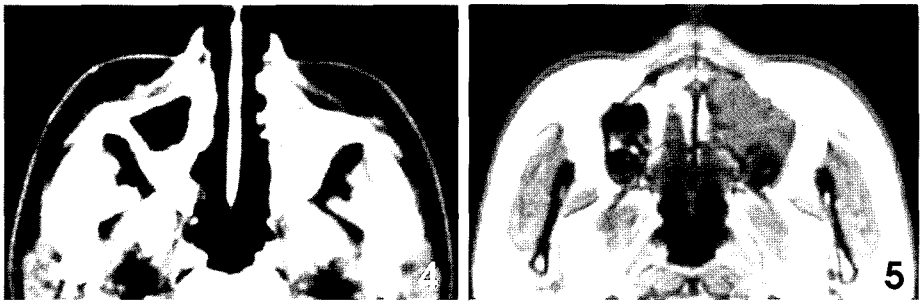

Fig. 4. Axial computed tomogram with soft algorithm reveals lesion showing isodensity to the muscles in the left maxillary sinus with partial cortical discontinuity of medial wall and internal straight trabeculations.

Fig. 5. Axial T1 weighted MR image shows a lesion of intermediate signal intensity in the left maxillary sinus.

with internal fine trabeculation. No teeth displacement or no root resorption but loss of lamina duras was recognized (Fig. 1 A, B). Occlusal film revealed a medially extended multilocular lesion with intralesional fine and straight trabeculations from the scalloped margin. Buccal expansion and thinning of cortical bone was recognized (Fig. 2). Water's view showed extensive radiopaque area with a multilocular internal structure in the left maxillary sinus (Fig. 3).

Axial computed tomogram with soft algorithm (Fig. 4) revealed an extensive multilocular radiolucent lesion showing isodensity to the muscles in the left maxillary sinus and partial discontinuity of medial wall. The overall appearance of the lesion in the series of computed tomograms with soft and bone algorithm was the tennis-racket pattern which had angular or rectangular relationships among intralesional fine and straight trabeculations.

Axial T1 weighted MR image (Fig. 5) showed a lesion of intermediate signal intensity in the left maxillary sinus. Axial T2 weighted MR image (Fig. 6) showed a lesion of heterogeneous high signal intensity with linear areas of no signal intensity corresponding to the internal straight trabeculations and the ossifications on CT. Gd enhanced MR image (Fig. 7) showed enhanced border with center areas not enhanced heterogeneously. Partial erosion of the medial wall of the left maxillary sinus and the extension of the lesion into the palatal area were recognized.

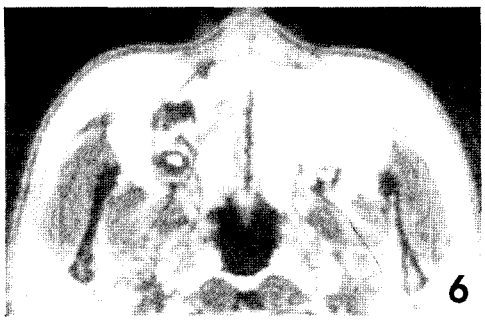

Fig. 6. Axial T2 weighted MR image shows a lesion of heterogeneous high signal intensity with linear and no signal intensity areas corresponding to the internal straight trabeculations and the ossified areas on CT.
Fig. 7. Gd enhanced MR image shows enhanced border with center areas not enhanced. Partial erosion of medial wall and extension of lesion into palatal area are recognized.

Discussion

Myxoma showed a wide spectrum of radiographic appearances in previous reports.[2-12] A characteristic feature of odontogenic myxoma was the intralesional fine and straight trabeculations, which frequently formed square or triangular compartments and were called "tennis racquet" appearance. However, so-called "soap bubble" or "honeycomb" appearances suggesting other lesions, including ameloblastoma or odontogenic keratocyst, were also reported.[2] The radiographic differential diagnosis includes lesions showing multilocular radiolucency such as ameloblastoma, odontogenic fibroma, dentigerous cyst, fibrous dysplasia, central hemangioma, central giant cell granuloma, giant cell lesions of hyperparathyroidism, cherubism, osteosarcoma, and chondrosarcoma.[3,22,23] In our case, only the occlusal film of the conventional films revealed a medially extended multilocular lesion with intralesional fine and straight trabeculations from the scalloped margin similar to the above description and the buccal expansion and thinning of cortical bone.

Septae were apparent in 14 cases of report by Peltora et al.[9] On CT images, 6 of 13 patients had tumours with a characteristic finding of straight trabeculations. These trabeculations could be observed in the peripheral portion rather than the central portion of the tumor.[14] These features were also depicted on CT images in the other reports[13,15,17,25] and observed on the inner side of the cortical margins in our case, most suggesting myxoma. This CT feature would have significantly contributed to allowing a diagnosis of odontogenic myxoma as Koseki et al.[14] mentioned. However, the fact that several tumours could not be differentiated from other lesions should be considered.

All tumours reported by Koseki et al.[14]showed relatively homogeneous density with the exception of internal trabeculations in the majority of the whole area demonstrated on the non-enhanced CT images. Ten lesions showed a lower density than that of muscles, while three showed equivalent density to the muscles. Figures in several other reports revealed that the density of the tumours was lower than that of muscle on non-enhanced CT images.[13,26,27] The density of our case was approximately isodense to the muscles.

Partial erosion of the medial wall of the left maxillary sinus and the extension of the lesion into the palatal area corresponding to the medially extended feature shown on occlusal film were shown on CT and Gd enhanced MR image of our case. Koseki et al.[14] reported that, in the maxilla, 6 of all 8 lesions showed a wide spread into the maxillary sinus. Expansion of the cortical plates or distortion of the maxillary sinus wall was seen in all patient. Furthermore, in 6 (75%) of 8 maxillary lesions, interruption of cortical plate continuity was seen in the maxillary bone and/or sinus wall. Kaffe et al.[3] reviewed that the border of the lesions were well-defined in 66%, poorly-defined in 16%, and diffuse in 18%. Odontogenic myxoma shows little encapsulation histologically and often extends into the soft tissue through the bony structures, so that complete resection is difficult and recurrence is common.[1] Although the border was observed clearly in the tumour within the bone, tumour cells could histologically spread into the surrounding intratrabecular space beyond the bony border.[24] These tumors of the maxilla may invade the palate, the orbit and the nasal cavity and cause symptoms referred to these structures.[4]

MR appearance of this tumor showed intermediate signal intensity on axial T1 weighted image and heterogeneous high signal intensity on T2 weighted image. Gd enhanced T1 weighted image showed enhanced border with center areas not enhanced.

As shown in Table 1, Kawai et al.[20] reported MRI of the maxillary myxoma showed a higher signal intensity on T1 weighted images and lower signal intensity on T2 weighted images. Soft tissue myxomas have also been reported to show low signal intensity on T1 weighted images and high signal intensity on T2 weighted images.[18,19] Kim et al.[13] reported MRI findings correspond to those of soft tissue myxomas.

Table 1. Magnetic resonance appearance of odontogenic myxomas reported H: high signal intensity L: low signal intensity I: intermediate signal intensity

	T1 weighted	T2 weighted	Gd enhanced T1
Kawai et al.[20]	I	I L	
Kim et al.[3]	L	H	mild enhancement
Petesson et al.[18]	L	H	
King et al.[19]	L	H	
Sumi et al.[21]		H	
Chiodo et al.[25]		H	

Sumi et al.[21] reported a case of myxoma which showed high signal intensity on T2 weighted images.

On T2 weighted MR images, the area containing abundant mucoid matrix with few cellular components was reported to show a high intensity. The solid portion of the tumor was reported to be rich in collagen fibre and was well enhanced on enhanced T1 weighted MR images.[15] As differential diagnosis, hemangiomas could show high signal intensity on T2 weighted MR images but hemangiomas show marked enhancement when enhanced with contrast media.[3]

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