RECURRENT ODONTOGENIC FIBROMYXOMA OF SUBMANDIBULAR AND LEFT TEMPORAL REGION: A CASE REPORT

Mohamad AF[1] , Abd Rahman S[2], and Mohd Safian AI[3].
[1]Department of Dental Science, Advanced Medical and Dental Institute, Universiti Sains Malaysia, 13200 Kepala Batas, Pulau Pinang, Malaysia
[2]Department of Oral and Maxillofacial Surgery, Health Campus, School of Medical Sciences, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia
[3]Department of Otorhinolaryngology-Head and Neck Surgery, Health Campus, School of Medical Sciences, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia

Correspondence:
Ahmad Fakrurrozi Mohamad,
Department of Dental Science,
Advanced Medical and Dental Institute,
Universiti Sains Malaysia, 13200 Kepala Batas, Pulau Pinang, Malaysia
Email: fakrurrozi@usm.my

Abstract
Odontogenic myxofibroma (OM) is a benign odontogenic tumour of maxillofacial bone with locally aggressive behaviour. It is thought to arise from the odontogenic ectomesenchyme of dental pulp or periodontal ligament. Odontogenic myxofibroma typically presents as painless slow growing tumour with high recurrence rates ranges from 10% to 45%. A case of recurrent odontogenic myxofibroma of submandibular, left preauricular and left temporal region presented in this case report. An 11-year-old Malay girl complaint of a painless, gradually progressive firm swelling on the lower left side of the jaw for 6 months duration. On clinical examination revealed firm swelling from the left angle of the mandible to the left parasymphysis area. A dental panoramic radiograph and computed tomography (CT) scan of the head and neck showed expansile lesion at left posterior mandible causing thinning and erosion of the mandibular cortex, multiloculated with tooth germ of 38 within and displaced inferiorly. Histopathological examination revealed stellate to spindle shape cells dispersed in a myxoid background. A final diagnosis of odontogenic myxofibroma has been made. Hence, left segmental mandibulectomy with condyle disarticulation was done via a submandibular approach. Unfortunately, a year later she had recurrence at bilateral submandibular region extending to left preauricular and left temporal region associated with pain and unable to close her mouth. Multiple surgery was carried out beginning with removal of the tumour at the bilateral submandibular region followed by removal of tumour at left temple. The operations were uneventful. However, tumour excision in the left preauricular region is yet to be performed pending magnetic resonance imaging (MRI) investigation to evaluate the soft tissue extension prior to surgical planning.

Keywords: Myxofibroma, Myxoma, Odontogenic Mesenchymal Tumour

Introduction

Odontogenic myxofibroma is a benign odontogenic tumour that is locally aggressive, thought to arise from odontogenic mesenchymal tissue that occurs in maxilla and mandible. Odontogenic myxofibroma's clinical presentation is non-specific, and its radiological characteristics are variable and difficult to distinguish from other bone eroding lesions of the jaws. Odontogenic myxofibroma typically presents as painless swelling and it is frequently diagnosed after incidental finding during routine check-up. Nonetheless, the tumour may be associated with pain, paraesthesia, and tooth mobility, especially in advance size lesion (1). Virchow was first to introduce the word ‘‘myxoma” in 1863 however it was Thoma & Goldman (2) that described odontogenic fibromyxoma as a gnatic tumour in a tooth-bearing area based on its location and age at onset, and correlation with histopathological examination that showed structural similarity with odontogenic mesenchyme (3).

Clinical, radiographical, and histopathological characters should be considered to diagnose OM. These characteristics may be shared with other benign and some other malignant tumours. The patient's age and sex, as well as the location and size of the lesion, should be taken into account when determining the best

treatment option. The current treatment options range from a conservative curettage to a radical excision. Reconstructive surgery may be indicated but it is wise to delay until adequate monitoring of the lesion to exclude recurrence. Odontogenic myxofibroma is well-known for its high recurrence rate in the range of 10% to 45% (4). This is due to the myxomatous nature of the lesion, the lack of a capsule, and the lesion's penetration into the surrounding bone without causing immediate destruction, resulting in incomplete removal and, eventually recurrence.

Case report

An 11-year-old Malay girl, presented to oral and maxillofacial clinic, Hospital Universiti Sains Malaysia with a complaint of a painless, gradually progressive firm swelling on the lower left side of the jaw for 6 months duration. It is associated with dysphagia, odynophagia and loss of weight. She denied any history of trauma and her past medical and dental history were not significant.

Extraoral examination revealed facial asymmetry with enlargement of the left lower half of the face. The swelling was firm, non-tender to palpation and had mild erythematous overlying skin with a normal complexion. Intraoral examination revealed large, firm swelling with buccolingual expansion from the left retromolar of the mandible extending anteriorly to the body of mandible displacing 35 and 36 lingually. Presence of ulceration at buccal mucosa in relation to occlusal surface of 25 and 26 was noted. The mass did not cross the midline and no lymphadenopathy was noted.

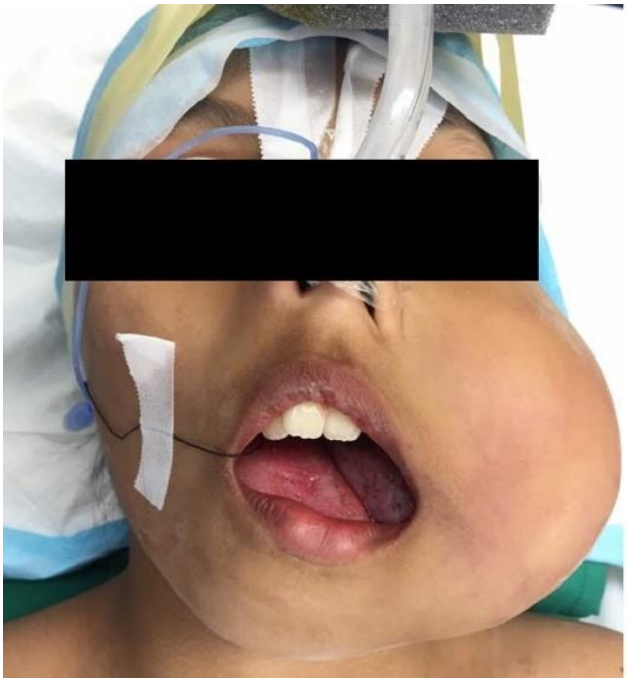

Figure 1: Extraoral photograph showing expansile swelling at left mandible

The panoramic radiograph showed a poorly defined, multilocular radiolucent lesion with thin wispy septa within, involving left body of the mandible extending to the left mandibular condyle. Computed tomography (CT) scan of the head and neck showed expansile lesion arising from the ramus of the left mandible causing thinning and erosion of the mandibular cortex, multiloculated with tooth germ of 38 within and displaced inferiorly. The mass was measured 7.7cm x 6.9cm x 7.4 cm.

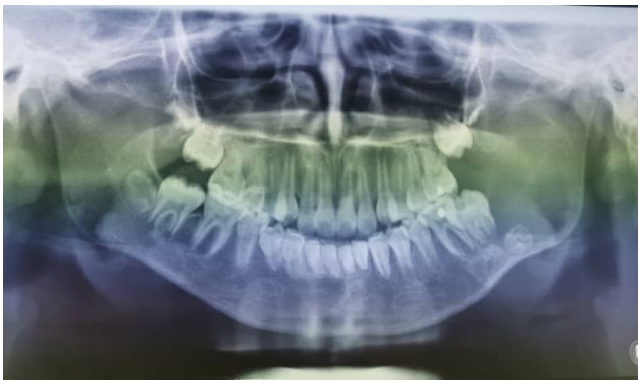

Figure 2: Panoramic radiograph showing poorly defined, multilocular, radiolucent lesion at left mandible

An incisional biopsy was performed, and sent for histopathological examination. Abundance of stellate to spindle shape cells dispersed in a myxoid background was seen under haematoxylin and eosin staining. The cells was mainly arranged in interlacing fascicles. No atypical mitosis identified. Collagen fibres were loosely arranged and the stroma was myxoid and collagenous. Based on the clinical examination in relation with imaging, and histopathological findings, an odontogenic myxofibroma diagnosis was made. Radical surgery was proposed in view of extensive tumour size. Left segmental mandibulectomy with condyle disarticulation was performed via a submandibular approach was done. The defect was reconstructed with reconstructive plate. However, upon 1-year post-operative follow up, the patient developed persistent fistula and lymphadenopathy in the submental region. Fine needle aspiration cytology (FNAC) of right submental mass disclosed mesenchymal lesion which was suggestive of recurrence. This time it was progressing faster than before.

A CT scan of the head and neck was repeated on post-operative review revealed multiple lobulated heterogenous enhancing soft tissue density at the previous surgical site suggestive of tumour recurrence. The lesion was seen in the left infratemporal, left parotid, left parapharyngeal, bilateral submental, submandibular, anterior & posterior cervical and carotid spaces.

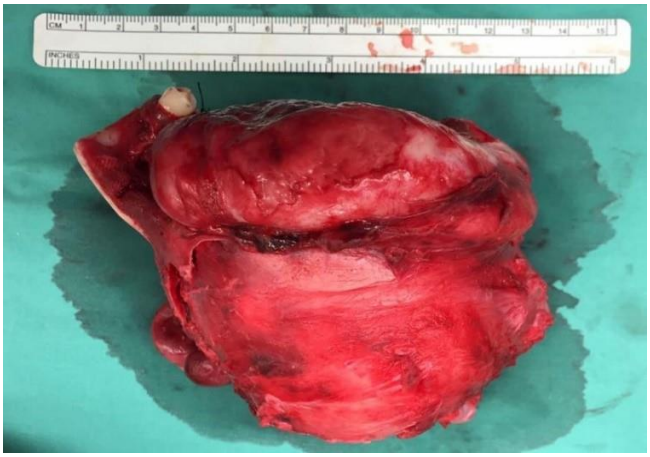

Figure 3: Specimen of left mandible

Despite being counselled and advised to consider a second radical surgery with delayed reconstruction, the patient and her parents refused due to domestic circumstances and subsequently absconded from treatment and follow up.

After three years, she came to our clinic presented with enormous swelling at bilateral submandibular region extending to left preauricular and left temporal area associated with pain and unable to close her mouth. On clinical examination revealed asymmetrical face, grotesque facial appearance with multilobulated, firm swelling at submandibular area which crossed the midline and superiorly extended until left temporal region. The skin appeared distended with normal complexion and no local rise in temperature, ulceration, or redness. Intraorally, mouth opening was limited to 20mm from the upper and lower incisors. The mass displaced the tongue to the right side obliterating the left posterior vestibule and also involving the left buccal mucosa. Flexible nasolaryngoscope showed the mass extend until left base of tongue and pushed vallecular, epiglottis, anterior 2/3 of vocal cord and aryepiglottic fold to the right side. Bilateral vocal cords are normal, mobile and symmetrical.

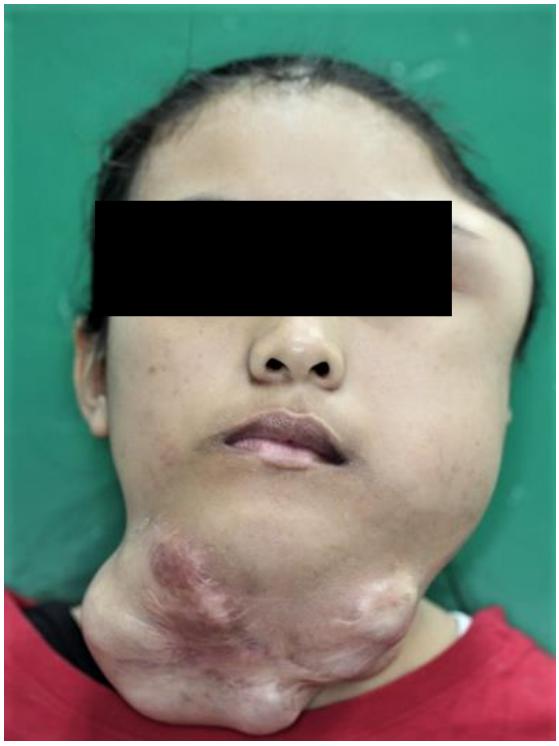

Figure 4: A preoperative photograph of recurrent odontogenic myxofibroma after 3 years. Note the tumour had crossed the midline and extended until left temporal region

Repeated CT scans of the head and neck showed the mass significantly increased in size, measures 8.5cm x 12 cm x 21.7cm. The mass was bounded superiorly by the hard palate and base of the skull. Posteriorly, it extends until the visceral space and also encases the left external carotid artery. Laterally, it displaced the left parotid gland with poor plane demarcation. Medially, it displaced the nasopharynx, oropharynx and larynx to the right side and obliterates the left pharyngeal mucosal space. Fortunately, trachea was patent and there was no intracranial extension.

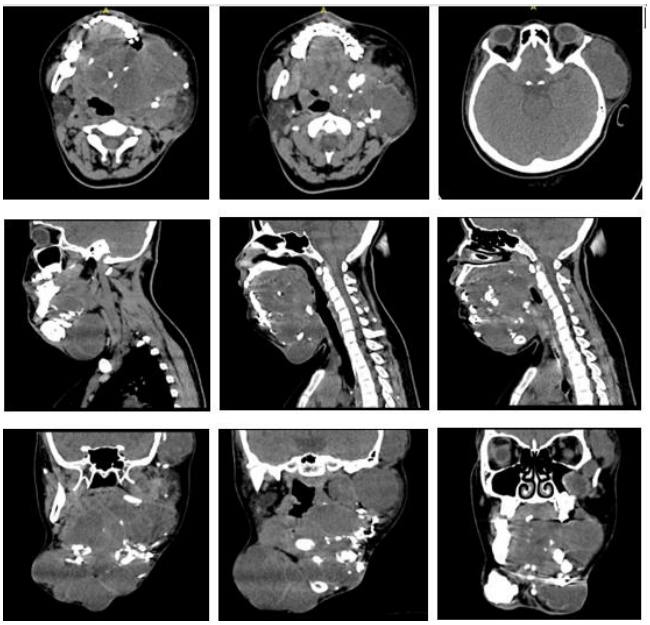

Figure 5. An axial, sagittal and coronal view of the Computed Tomography (CT) scan shows heterogenous enhancing mass involving bilateral submandibular extending to left temporal area with some region of coarse and dense calcifications

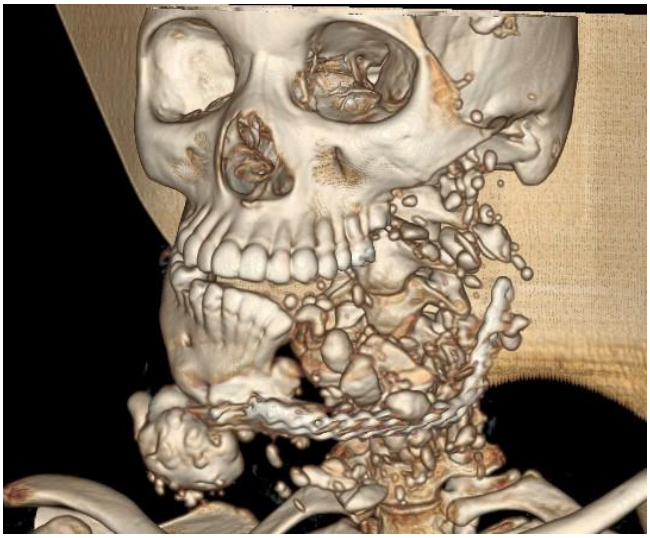

Figure 6: A 3-D reconstruction of a CT scan shows bony destruction at left mandible with multiple bony calcification

Surgery was carried out in multiple settings in view of rapid growing of tumour associated with severe pain. The first surgery was wide resection of the tumour in the bilateral submandibular region via extended submandibular approach. Intraoperatively, the tumour was seen as expansile multiloculated masses, thinly encapsulated with a plane of separation with adjacent bone and muscles. The tumour was removed uneventful with preservation of marginal mandibular, great auricular and hypoglossal nerves. A 1cm healthy anatomic bone margin was resected. Another surgery was performed in three weeks gap for wide tumour resection at left temporal region in view of severe pain. Intraoperatively, there was no bony involvement and intracranial extension. All margins were cleared on histopathological examination and no recurrence was observed after 5 months post-operative.

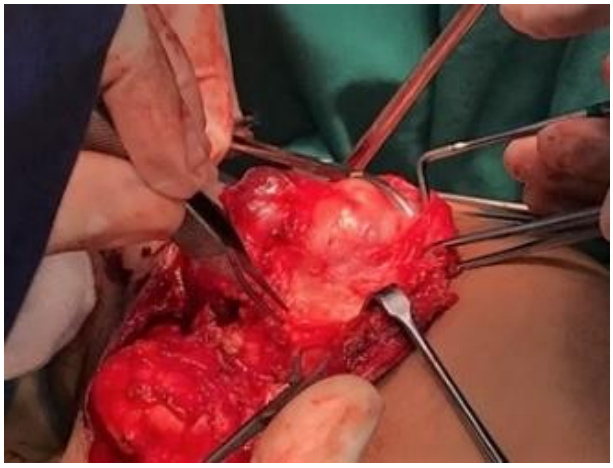

Figure 7: Multiple lobulated encapsulated tumours in the submandibular region

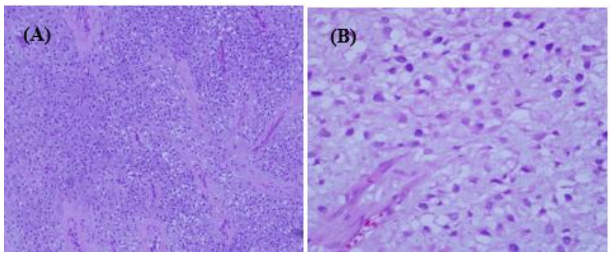

Figure 8: Well circumscribed encapsulated tumor at left temporal measuring 85mm x 60mm x 40mm with lobulated, smooth and glistening outer surface

Discussion

Myxomas are rare benign tumours of that originate from mesenchymal tissue. They are known for their behaviour of locally invasive. These tumours can manifest themselves in a variety of locations throughout the body, such as the genitourinary tract, the heart, the bones, the skin, the subcutaneous tissue, the aponeuroses, and the skeletal muscles (5). According to Moore et al. (6), the majority of myxomas that are reported to be within the head and neck region affect mainly the maxilla or mandible.

Odontogenic myxoma, also called odontogenic fibromyxoma or myxofibroma, is a type of myxoma that happens most often in the bony tissues of the maxillofacial region, albeit peripheral fibromyxomas are exceptionally rare (7, 8). Due to the rarity of the lesion, wide variation in the incidence rate of odontogenic myxofibroma were reported ranging from 0.5% to 19% (9, 10).

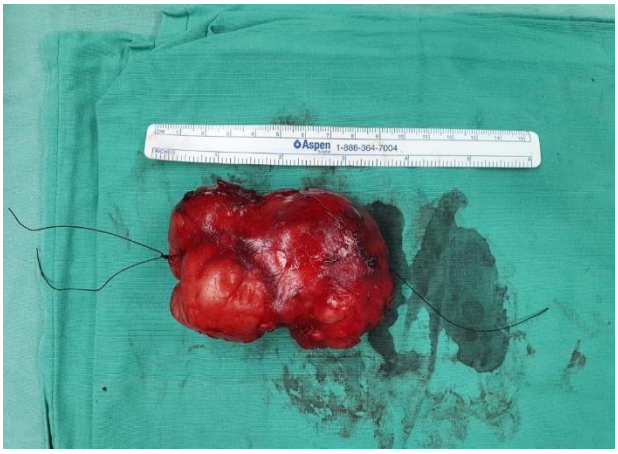

Figure 9: Microscopic appearance. Hematoxylin and eosin-stained tissue revealed bland spindle shape cells with long cytoplasmic processes distributed evenly in loose and abundant mucoid tissue A) 10X magnification B) 40X magnification

According to Regezi (11), odontogenic myxofibroma accounts for 3% of all odontogenic tumours in a retrospective study involving 706 odontogenic tumours. The usual age is between 10 to 40 years of age, with a peak incidence in the third decade of life and a male to female ratio is 1:2 (9).

Odontogenic myxofibroma is commonly found in relation to a tooth-bearing areas particularly in the mandibular premolar and molar region (1). In the present case, the lesion was in the region of left molar displacing the tooth germ of left mandibular third molar inferiorly. There have been reports of odontogenic myxomas occurring in non-tooth bearing areas such as mandibular ramus, condyle and very rarely, the gingiva (12).

Most of the time, OM is painless however, in this case, the patient presented with severe pain at left submandibular and left temporal area. This can be explained by the soft tissue invasion of the tumour and advanced tumour size that cause compression on the nerve structures (9). Ulceration at buccal mucosa due to buccolingual expansion of the tumour and traumatic biting also causing pain intraorally. In this presenting case, the lesion has crossed the midline as the tumour spread to the contralateral side of the affected mandible. Having said that, odontogenic myxomas crossing the midline are rare because it presented with expansile swelling with possible facial disfigurement (1, 9). However, financial issues and lack of awareness may be the reason behind the late presentation to hospital.

Histogenesis of odontogenic myxoma is most likely related to odontogenic ectomesenchyme. However there is no agreed consensus (13). World Health Organization (WHO) classified odontogenic myxomas and fibromyomas as mesenchymal odontogenic tumours (14). These tumours are thought to be of odontogenic origin due to the fact that they arise in tooth bearing areas of the maxillofacial bones and are reported almost exclusively in the jaws (15). These theories are supported by the histological similarity between odontogenic myxoma and pulpal ectomesenchyme, proximity to the tooth-bearing areas of the jaws, periodic association with missing or unerupted teeth, occasional presence of inactive odontogenic epithelium, and its uncommon occurrence in other parts of the skeleton (16).

On gross macroscopic examination, we noticed that the tumour was well circumscribed, encapsulated with lobulated, smooth and glistening surface. However, it was not a true capsule as confirmed by histopathological examination. The tumour was soft to firm in consistency and serial cut of the tumour section revealed a heterogenous whitish surface.

In our case, the presence of spindle and stellate shaped cells in myxoid stroma along with collagen fibres were important in establishing the diagnosis. Absent of atypical mitosis and atypical nuclear pleomorphism indicating this tumour is benign in nature. Immunohistochemistry studies of odontogenic myxomas are thought to be of little value in differentiating this lesion from other nonodontogenic cell tumours (17). In this case, the cells are negative for S-100 protein, CD34, desmin, epithelial membrane antigen (EMA) and smooth muscle actin (SMA).

Fibromyomas that exhibit a prominent hyalinized or collagenous background and nests of odontogenic epithelium are variably present, although these are thought to be a residual element rather than an integral part of the lesion but not essential for diagnosis (9, 18). In this case, some areas displayed a distinct arrangement of poorly fibrous myxoid foci with calcified trabeculae with features of bone metaplasia. We believe these calcifications were formed by the lesion as they are distinct from the residual bony trabeculae found between tumour lobules, particularly near the surface. In addition, Noffke et al. (16) proposed that OM should be considered in the differential diagnosis of mixed radiolucent-radiopaque lesions in correlation with its radiographical appearance.

Although benign, odontogenic myxoma is known for its locally aggressive behaviour. It invades surrounding normal bone and soft tissue (8). The expression of Matrix metalloproteinases 2 and 9, which break down type IV collagen, the primary component of the basal membrane, are thought to be the mechanism behind this invasive nature. In order to facilitate tumour growth, it is thought that these enzymes act on the extracellular matrix (ECM), making it easier for tumour cells to break through the bony trabeculae (19).

The radiological appearance of odontogenic myxoma may appear as a unilocular or multilocular radiolucency and

variably described as mottled, soap-bubble, tennis racquet, or honeycombed pattern with cortical expansion and tooth displacement. The radiolucency may have well defined borders, poorly defined or diffuse borders suggestive rate of tumour growth (16). In this presenting case, the radiological appearance was of a multilocular, well defined margin, mixed radiolucent-radiopaque type with the presence of wispy bony trabeculae within the radiolucent area.

Computed tomography (CT) scan revealed the tumour was extensive as it displaced the nasopharynx, oropharynx and larynx to the right side and obliterates the left pharyngeal mucosal space. It also encases the left external carotid artery and displaced the left parotid gland laterally with poor plane demarcation. Hence, MRI is indicated for surgical planning and facilitates the differentiation between fibrous connective tissue and tumour tissue due to different signal intensities particularly in this recurrence case.

Accurate diagnosis is a challenge if only based on routine radiographic findings, as the features of odontogenic myxofibroma may overlap with other lesions. Ameloblastoma, intraosseous hemangioma, aneurysmal bone cyst, central giant cell granuloma and cherubism are among differential diagnosis based on radiological appearance (1, 8). Central giant cell granulomas usually occur in the body region, anterior to the first molar unlike odontogenic myxofibroma that favours the posterior region. Meanwhile, cherubism is commonly found in children as opposed to OM that peak in the second and third decades. Intrabony hemangioma can be ruled out because aspiration of OM is non-productive. In addition, aneurysmal bone cysts typically present with symptoms such as tenderness and pain in contrast to OM. The possibility of a malignant tumour such as osteosarcoma must be considered, especially in older patients (8). Accurate diagnosis requires biopsy. Histological differential diagnosis should include desmoplastic and odontogenic fibromas. Compact whirling fibrous fascicles and threadlike nuclei distinguish the former. OM has stellate-shaped cells and myxoid components, but odontogenic fibroma is mature collagenous fibrous tissue (20).

Effective communication between the clinician and pathologist is essential to establish an accurate diagnosis. Depending on the size, nature, and behaviour of the lesion, conservative curettage or radical excision may be recommended. To avoid resection-related morbidity and quality of life, tumours under 3cm should be treated conservatively (21). However, in this case, we decided for radical primary resection of the tumour with maximal preservation of surrounding anatomic structures considering the high reported rate of recurrence when treated conservatively. Radical resection was done with healthy anatomic borders of 0.5–1.0 cm beyond the radiographic border of the tumour as proposed by few studies (22). This radical approach was mandatory in this case as the lesion was non encapsulated causing the myxomatous tissue to infiltrates the adjacent bones and soft tissues beyond radiographically visible margins making complete surgical removal by mean of curettage and peripheral ostectomy alone insufficient. These characteristics may explain the recurrence in this case with evidence of mandibular cortex perforation and soft tissue extension on a CT scan. The current consensus holds that radiotherapy has no role in the management of odontogenic myxoma because odontogenic myxofibroma is insensitive to radiotherapy (9).

In this case, wide tumour excision at bilateral submandibular and temporal region was performed and we decided to reconstruct the mandibular defect using a titanium reconstruction plate to avoid complete collapse of the left mandible. Final reconstruction with vascularized fibular free flap in view of huge mandibular defect is delayed until adequate disease free is established. A new emerging 3 dimensional-printed titanium patient's specific implant has an increasingly valuable role in mandibular reconstruction as it allows immediate function and reduces the need for a second surgical site and the associated morbidity (23). However, the cost of designing and fabricating the implants is a major disadvantage.

There is no consensus or protocol regarding follow up of OM. However, regardless of surgical method, it is mandatory that the patients with odontogenic myxofibroma to be follow up closely at least two years postoperative, which represents the period during which the neoplasm is most likely to recur (4). Meanwhile, Rocha et al. (24) suggested that 5 years of surveillance is needed to confirm successful excision before performing reconstructive surgeries. All in all, the ideal follow-up should be maintained indefinitely.

Conclusion

Odontogenic myxofibroma is a rare benign tumour that can cause detrimental destruction of jaw bones and ultimately lead to gross facial disfigurement. This will have a negative psychological impact on patient especially growing children. In view of locally aggressive behaviour and high recurrence rate, odontogenic myxofibroma should be treated with radical surgery and reconstruction should be delayed until disease free is established. Nevertheless, long-term follow-up is indispensable with regular clinical and radiographic examinations.

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