Monostotic Fibrous Dysplasia: A Case Report
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Abstract
Fibrous dysplasia (FD) is a benign fibro-osseous bone disease of unknown etiology and uncertain pathogenesis. When bone maturation is completed, indicating the occurrence of stabilization is a strong evidence of mechanism. The lesion frequently affects the craniofacial skeleton. The maxilla is affected twice comparing mandible and occurs more frequently in the posterior area. In this case, a 16 year-old female patient is presented who was diagnosed as having maxillofacial fibrous dysplasia.

Keywords: Fibrous dysplasia; Maxilla; Jaw diseases; Monostotic form

Introduction
Fibrous dysplasia (FD) is a benign fibro-osseous pathologic condition characterized by the replacement of bone with fibrous tissue [1,2]. The lesion is firstly described by Lichtenstein [3] in 1938. In 1937, Albright et al. [4] described a syndrome characterized by polyostotic fibrous dysplasia that included: areas of pigmentation, skeletal changes and endocrine failure (the most striking example is precocious puberty in girls).

If fibrous dysplasia affects only one bone, it is called monostatic FD, but multiple bones may also be affected this form is called polyostatic FD [1]. In addition to these forms, Jones [5] described hereditary familial form of localized FD which is called cherubism.

The clinical findings are asymptomatic involved bone enlargement which causes facial asymmetry, loss teeth and facial deformity [6,7]. If the cranio-maxilofacial bones are affected by FD, due to megacranium, the face of the patient is referred to 'lion face' [6].

The complications of the lesions involving sphenoid, orbital, frontal bones, are proptosis, visual disturbances, facial asymmetry and orbital dystopia [8,9]. The fifth nerve impairment, hearing loss and seizure disorders have been reported as neurological complications [10].

In our case, monostotic FD localized in the left side of maxilla that caused bone expansion and facial asymmetry is presented.

Case Report
A 16 year-old female referred to our clinic with the complain of swelling on the left side of maxilla. In the history of the patient, the swelling was noticed by her friends 4 years ago but the patient didn't know when the swelling had occurred. There was trauma history when she was a baby.

On extra oral examination diffused swelling of about 0.2 cm was present on left side of the face extending superio-inferiorly 0.5 cm below the cantho tragus line; to line joining corner of mouth to tragus and anteroposteriorly 0.2 cm away from the corner of the mouth to 1 cm in front of left tragus (Figure 1). On palpation the consistency was bony hard, nontender & no local rise of temperature. Buccal and palatal cortical plates were expanded (Figures 2 and 3). Overlying mucosa appeared normal, firm and was nontender.

Blood & Biochemical investigations showed alkaline phosphates 87 IU/l, Serum Calcium 9.8 mg% & Serum Phosphorus 3.1 mg% which were within normal range.

Radiological investigation includes panoramic radiography and cone beam CT (CBCT) scan. Panoramic radiography shows gross radio-opacity in the maxillary bone from first premolar region to tuberosity region. Which gives ground glass appearance (Figure 4). There was no root resorption or displacement of teeth on the affected...
believed to be hamartomatous developmental abnormality of bone spicules of bone lie in cellular fibrous stroma [11,12]. The lesion is monostotic form of FD. The patient was referred to the Department of Oral and Maxillofacial Surgery for further treatment, but treatment was deferred till the age of 18 years. The patient was advised to visit her dentist regularly for ongoing re-examination and to observe and inform for any change in growth formation and appearance of pain. In the re-examine periodically is measured the level of alkaline phosphatase. Intraoral swelling of the palatal cortical plates.

**Figure 3:**

**Figure 4:** Panoramic radiograph shows a massive, radiopaque lesion which has ground glass appearance in the left side of maxilla that involves maxillary sinus and floor of the orbit.

**Figure 5:** Axial and coronal scans of CBCT shows radiopaque lesion which extends from premolar area to the tuber maxilla, vertically the floor of orbit and comprises maxillary sinus on the left side.

FD is commonly benign lesion in which irregularly distributed spicules of bone lie in cellular fibrous stroma [11,12]. The lesion is believed to be hamartomatous developmental abnormality of bone of unknown etiology [13]. However, there is some evidence that the etiology of FD may be local infection or trauma [14]. In our case, we found a trauma history in the childhood of patient.

Studies of FD show no sexual predilection except for Mc Cune Albright syndrome which affects females almost exclusively. FD is seen maxilla more than mandible and occurs frequently in the posterior area [15]. This condition is being supported with our report. The polyostotic form usually is seen in children younger than 10 years, whereas monostotic form typically is found in an slightly older age group [15]. Ozek et al. [13] reported in the series of 16 patients with FD of the craniomaxillofacial bones, one patient was in his first decade, 11 patients were in their second decade, 3 patients were in their third decade and one patient in the series was in his fourth decade when the symptoms occurred. Hence our patient was in her second decade, our case supported to the case of Ozek et al. [13], Keijser et al. [16] reported the case with 13 patients after 20 years of age, the two of cases are polyostotic and the rest of cases are monostotic. In our case, the lesion is also monostotic form of FD.

In most cases, the radiographic and clinical findings are sufficient to allow the practitioner to diagnose without a biopsy [15]. The differential diagnosis with similar radiographic appearance such as ameloblastoma, ameloblastic fibroma, ameloblastic odontoma, ameloblastic fibro-odontoma, central giant cell granuloma, odontogenic cyst, ossifying fibroma, ossous dysplasia, chronic sclerosing osteomyelitis and osteosarcoma should be considered [17]. In our case, there was no compelling indication to seek a biopsy, any sudden change in the clinical presentation or behavior of the lesion might warrant further investigation.

Intraoral swelling of the palatal cortical plates.

**Figure 3:**

**Figure 4:**

**Figure 5:**

The density and trabecular pattern of FD lesions is variable. Early lesions may be more radiolucent than mature lesions and in rare cases may appear to have granular internal septa, giving the internal aspect a multilocular appearance. The abnormal trabeculae usually shorter, thinner, irregularly shaped and more numerous than normal trabeculae. This creates a variable radiopaque pattern, it may have a granular appearance ('ground-glass' appearance, resembling the small fragments of a shattered windshield), a pattern resembling the surface of an orange (peau d'orange), a wispy arrangement (cotton wool), or an amorphous, dense pattern. A distinctive characteristic is the organization of the abnormal trabeculae into a swirling pattern similar to a fingerprint [15]. Prapayasatok et al. [18] reported a case which was seen a rare radiographic 'sunray' appearance in 19-year-old woman. In this presented case, the panoramic radiography revealed a 'ground-glass' appearance of the affected area.

FD is a rare but severe bone disease which may cause fractures in long bones, deformities and bone pain. Although most lesions appear to stabilize when approaching bone maturity, some cases can reach severe asymmetry, visual impairment, diplopia, pain, paresthesia, proptosis, hearing loss, anosmia, nasal obstruction, epistaxis and epiphora. The patients generally complain of swelling (%94) and pain (%15) [19]. In our case, the patient referred to our clinic with complain of swelling.

When the lesion involves frontal bone, nasal bones, orbit, ethmoid, zygoma and upper maxilla, radical surgery is suggested but this approach is difficult in treatment of recurrences. Because radical surgery would possibly increase morbidity by removal of teeth. Hence, conservative treatment has been treatment of choice. Shaving and debridement of lesion are parts of conservative treatment [20]. Previous radiation and spontaneous degeneration may be the reason of malignant transformation. The frequency of sarcoma which occurs after radiotherapy, is high [21].
If FD is asymptomatic, it can be noticed incidentally in CBCT, CT scans and radiographs. If there is no symptom or evidence of progression during follow-up, surgical treatment isn't considered [13].

Recurrence of FD is rare when the lesion has occurred in adults but it is seen more commonly in growth period [22]. Because of the conservatice surgery and unsuccessful removal of the lesion cause the increased risk of recurrence. Patients with craniofacial fibrosus dysplasia have the risk of recurrence ranged from 15 to 20% [23,24]. Concentration of serum alkaline phosphatase (ALP) may be important marker for detection of the recurrence of the lesion. The patients who had FD, have higher ALP, this may be a reliable marker for estimating tumor progress and a sudden rise in ALP was correlated with the regrowth of FD by Park et al. [25].

The maxillary area and also other areas of cranio-maxillo-facial skeleton which includes the structures such as the orbital region, mandibular or the zygomatic bone, the cranial base, may cause some problems to the surgeon because of their anatomical relationship to important structures [25].

Chapurut et al. [26] reported that they provide evidence that in FD treated with intravenous pamidronate, bone turnover could be reduced, bone pain could be alleviated and radiological lesions could be improved. Few studies have reported the nonsurgical treatment of FD. At least in aggressive forms of FD, increased remodeling activity and bone resorption encouraged some open therapeutic trials with calcitonin in order to inhibit osteoclastic resorption [26]. Bell et al. [27] reported a decrease in elevated urinary excretion of hydroxyproline in a patient who had been treated with calcitonin for 16 days. There was no report about the effects of using calcitonin on clinical symptoms or X-ray abnormalities. The effects of treatment using disodium etidronate in an 18-year-old male patient diagnosing polyostotic fibrous dysplasia who had used calcitonin for 3 months as an unsuccessful treatment, were reported in one study [28]. Pamidronate is a potent inhibitor of bone resorption like other biophosphonates, a lasting effect on bone turnover [29]. Pamidronate has been successful treatment in Paget disease [30,31], malignant hypercalcemia [32], lytic bone metastases [33,34], multiple myeloma [35] and osteoporosis [36,37].

In the study of Chapurut et al, pamidronate has led to decrease in pain severity and in the number of painful areas per patient and partially an open study permits to result [26].

Treatment of mandibular defects is complex and includes free vascularized flaps. Donor areas involve the iliac crest, radius, scapula and fibula [38-40]. Taylor et al. [41] firstly reported the transfer of the free fibula flap. In 1989, the method was used for the segmental mandiblectomy defects by Hidalgo [42]. The fibular flap is considered as one of the ideal flaps for long mandibular defects and is superior to the iliac crest for this purpose, especially in older patients [43]. Munoz Guerra et al. [44] reported 26 cases with using vascularized free fibular flap for mandibular reconstruction. Six patients weren't operated because of development of a vascular crisis and 5 flaps were successfully salvaged (83.3%). In 2 cases, a false positive exploration occurred, in 2 vascular compression occurred and in 1 case each of venous thrombosis and cervical hematoma occurred. Except 1, the rest of fibular flaps survived (loss rate of flap 3.84%). In 2 patients, the donor area was closed primarily without a skin graft. In the rest of patients, skin grafting was performed to the donor site [44]. In addition, fibula provides sufficient amount of bone width and height to support osseointegrated implants which serve fort he support of overdentures and for functional reconstruction [45-47]. Barber et al. [48] evaluated the osseointegration of implants which were placed into fibular flap used in cancer patients following radiation therapy and subsequent hyperbaric oxygen therapy. 20 implants that were placed in the flap, has osseointegration clinical even the time the implants were uncovered and during the 6 months, the cases were followed up.

In our case report, we document the clinical and radiological features in a case of FD which is thought that trauma history may be a reason. The lesion exhibited extension into the extraosseous tissues. Our case with its clinical and radiographic features represents an addition to the literature of monostotic FD.

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