Cherubism: Case Report with Review of Literature

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Abstract Cherubism is a rare hereditary fibro-osseous lesion characterized by painless expansion of jaws in childhood and is known to regress without treatment after puberty. Wait and watch approach has been advocated by many authors. The disease starts early in life manifesting itself fully in the second decade of life and is almost regressed in the third decade. Here, we report two cases of cherubism with clinico-radiographic presentation of its classical features in their third and fourth decade of life respectively and review the literature.

Keyword Cherubism · Fibro osseous · Maxillary lesion

Introduction

Cherubism is a rare, non neoplastic, self limiting, fibro-osseous disease characterized by painless expansion of mandible or maxilla or both. Children are normal at birth and jaw is noticed to be expanding within the first few years of life progressing to further enlargement until

adolescence. It is genetically inherited [1, 2], although non familial cases have also been reported [3–5] in the literature.

Case 1

A 27 year old female (Figs. 1, 2) visited the outpatient department of oral and maxillofacial surgery, faculty of dental sciences, CSMMU UP, Lucknow, with complaint of pain and swelling in her right side of the face. She first noticed the swelling 15 years back which gradually increased to the current status. The patient reported facial asymmetry with gross chubby appearance. Both horizontal and vertical dimensions of the face were increased, more pronounced on the right side. The face had a straight profile with chin more prominent and deviated towards left. The skin of the mandibular region was stretched and superficial veins were prominent. Bilateral submandibular lymph nodes were enlarged, non tender, about 1.5 cm in size. On ophthalmic examination, orbital floor was raised pushing the eyeballs which seemed to be looking upwards. Lateral canthus of the eyes was displaced on both sides (Fig. 3) giving antimongoloid slant to the face with ectropion of the lower eyelids. Intra-oral examination (Fig. 4) revealed both maxillary and mandibular arch to be edentulous. She gave a history of teeth exfoliation gradually in the last ten years. Mandibular arch showed two prominent swellings (Fig. 5); first being in the incisor area, second larger one in the left canine premolar region. Swelling was reddish, firm and non tender on palpation. There was significant expansion of maxillary and mandibular alveolar ridges both buccally and palatally/lingually. On radiological examination, occipito-mental view skull (Fig. 6) showed bilateral haziness of maxillary sinus. Postero anterior view of the skull (Fig. 7) showed bilateral, diffuse, multilocular radiolucencies in

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Fig. 1 Front view of a patient with cherubism showing massive expansion of all facial bones

Fig. 2 Submentovertex view same patient showing expansion of facial bones

maxilla and mandible, zygomatic and frontal bone. Histo-pathological examination showed multiple multinucleated giant cells together with ovoid to spindle shaped cells within a fine fibrillar collagenous stroma, numerous small vessels with large endothelial cells and perivascular capillary cuffing (Fig. 8) confirming the diagnosis of cherubism. Patient was planned for curettage of the mandibular lesion.

Fig. 3 Classical orbital features of cherubism

Fig. 4 Intraoral picture showing maxillary expansion

Fig. 5 Intraoral picture showing mandibular swellings

Case 2

A 32 year old male (Fig. 9) presented in the outpatient department of oral and maxillofacial surgery, faculty of

Fig. 6 Occipitontal view xray skull of same patient showing expansion of all facial bones

Fig. 7 Postero anterior view skull of same patient showing expanded facial bones

dental sciences, CSMMU, Lucknow with inflamed reddish growth in the mandibular anterior region, growing in last 6–7 months at a very fast pace and developing to the current size. There was bilateral puffiness present in the maxillary region which gradually increased to the present size in 10–12 years. Facial asymmetry with chubby appearance of the face was present with prominent swelling of the face on the right side and conjunctivitis. Bilateral

Fig. 8 Histopathological picture of cherubism showing giant cells

Fig. 9 Front view of another case of cherubism

Fig. 10 Intraoral picture showing mandibular lesion

submandibular lymph nodes were enlarged and tender, about 2 cm in size. Bilateral orbital floor was raised with prominent medial canthus. Sclera was more pronounced in the lower two thirds of the eye giving the appearance of the patient looking upwards. On intra-oral examination (Fig. 10) both maxillary and mandibular arch were dentate with a large exophytic inflamed growth that extended from mandibular left canine to right premolar area. Radiographically, orthopantomogram (Fig. 11) showed bilateral multilocular lesion extending from mandibular first molar

Fig. 11 Orthopantomogram showing mandibular involvement

Fig. 12 CT Scan axial section showing maxillary involvement

on one side to that another side and horizontal impacted mandibular canine. CT scan showed multilocular areas of varying sizes in both maxilla and mandible (Fig. 12). Later incisional biopsy of the lesion confirmed the diagnosis of cherubism showing multiple multinucleated giant cells within a fibrillar stroma along with numerous small vessels, large endothelial cells and perivascular cuffing. Curettage of the mandibular lesion was carried out and patient was advised for a regular follow up.

Review of the Literature

Jones [6], was the first to describe cherubism as a familial multilocular cystic disease of the jaws. In the recent literature review, cherubism is associated genetically [1, 2] as an autosomal dominant disorder in which normal bone is replaced by cellular fibrous tissue and immature bone. Among the craniofacial component, mandible is the most severely affected bone which deteriorates the aesthetic balance of the face. Bilateral swelling of the cheeks, mandibular and maxillary enlargement causes orbital manifestation and tendency of eyes looking up to the sky. In a study [1] cherubism has been defined as a genetically determined alteration of tooth germ development which

indicates familial occurrence and observed its correlation with a mutation in gene SH3BP2.

Cherubism received its name because of angel like appearance of the patients (Chubby and upward directed look). Burkhardt and Berthold (1986) [7] examined the tissue taken from a boy afflicted with cherubism using light and electron microscopy and immunohistology and found a close relationship of cherubism with giant cell granuloma of the jaws. The histological examination showed fibro-histiocytic tissue with multinuclear histiocytic giant cells thinly disseminated throughout the fibrous tissue. Immunohistochemistry analysis demonstrates tartarate resistant acid phosphatase revealing osteoclastic character of these giant cells.

Although cherubism appears to be inherited as an autosomal dominant trait with 70% in females and 90% in males, other pattern of inheritance and association with syndromes has been reported [8–10]. Around puberty the condition begins to regress until by 30 years of age, when lesions frequently are not detectable. The literature shows that the lesion tends to occur twice as often in the mandible than in the maxilla [11–13]. Orbital involvements in cherubism may develop beyond puberty after stabilization or regression of the lesion of the jaws. Patients with cherubism should be routinely evaluated by an ophthalmologist. In a general population, large and aggressive lesions are less common, than suggested by literature. Multiple lesions however, occur more frequently than previously assumed.

Cherubism has been classified according to the severity grades with a supplement (in *italics*) from the Seward and Hankey [14] system:

Grade I: Involvement of bilateral mandibular molar region and ascending rami, mandible body or mentis.

Grade II: Involvement of bilateral maxillary tuberosities as well as the lesion of grade I, diffused whole mandible.

Grade III: Massive involvement of the entire maxilla and mandible except the condyles.

Grade IV: Involvement of both jaws with condyles.

The authors have reviewed the literature and presented it in tabular form (Table 1). In general, the treatment of cherubism is to biopsy the lesion, extract any ectopic and impacted teeth and correct it surgically when appropriate [1, 3–5, 15]. Some surgeons wait and approach to observe the condition because it is assumed that the lesion resolves automatically on its own in the third decade of the life. The cherubic appearance in a young patient may be highly traumatic to the psychosocial element of ones personality, so surgical reconstruction and correction of the deformity as an option cannot be ruled out. In patients with aggressive signs and symptoms, surgical curettage is not an effective therapy [16].

Table 1 Review of various treatment modalities for the management of cherubism

Serial no.	Year	No. of cases	Author	Report	Treatment	Remark
1	2007	1	Lange et al. [23]	Treated with calcitonin	With calcitonin	Further research needed as a randomized controlled trial
2	2006	2	G C Silva et al. [17]	Long term follow up of two patients	None	Regressed without treatment
3	2005	5	Lange et al. [16]	Description of clinical and radiological features of central giant cell lesions of the jaws	None	In patients with aggressive signs & symptoms surgical curettage is not an effect therapy
4	2005	1	Hyckel et al. [1]	A new hypothesis on pathogenesis and therapeutic consequences	None	Because of the genetic determination surgical removal should be restricted to specific indications – deterioration of visual activity. An attitude of wait & see should be preferred. A remodeling osteotomy as in the case of fibrous dysplasia is not indicated
5	2005	24	Meng et al. [3]	Clinico-pathologic study of 24 cases of cherubism	None	Medical therapy in the form of calcitonin is theoretically appropriate
6	2004	1	Shah et al. [18]	Malignant mesenchymal tumour arising from cherubism: a case report	Surgical curettage and re-contouring	Surgical curettage and recontouring during rapid growth period offers favourable immediate results and arrests its active growth and stimulates bone regeneration Cherubism with extensive bilatera orbital involvement occurring in a 27 year old woman who had diagnosis established at the age of 4 year
7	2003	1	Font et al. [19]	Giant cell reparative granuloma of the orbit associated with cherubism	Multiple surgical excisions using a bicoronal & a trans orbital approach	An 8 year old boy with a locally aggression lesion, severe facial swelling which progressed rapidly
8	2002	1	E C Silva et al. [20]	An extreme case of cherubism	None (Only lab investigations done)	Orbital involvement in cherubism may develop beyond puberty after stabilization or regression of the lesion in the jaws
9	2001	1	Fernando Colombo et al. [21]	Orbital involvement in cherubism		Remission of bony lesion without surgical intervention
10	2000	18	Wowem et al. [4]	36 year follow up of 2 generation in different families	None	Reported an oosteosarcoma in the Cherubism affected irradiated area
11	1999		Mangion et al. [22]	The gene for cherubism maps to chromosome 4p16.3	Radiotherapy of the cherubism affected lesion	Regression of the lesion without treatment
12	1992	1	Katz et al. [5]	Case report	None	
13	1979	20	Peters et al.	A study of 20 cases from the family	None	Curettage in early childhood shows tendency to relapse as high growth potential and incomplete removal
14	1965	1	Jones et al.	A sketch of its diagnosis and conservative treatment		Attempts to control this disease with radiotherapy have to be rejected completely
15	1959	20	Thompson et al.		None	
16	1957		Volker et al.			Curettage in the beginning of the resorptive phase was successful
17	1951		Caffery et al.	Familial fibrous swelling of the jaws		
18	1933		Jones [6]	Familiar multilocular cystic disease of the jaw	Surgical curettage	

Discussion

The current knowledge about the clinical behaviour of cherubism is based on the study by Jones [6], on a few series of cases and some single case reports. However, most reports did not follow the patients for a sufficient period of time to confirm spontaneous regression. In some cases, patient's adult appearance has been found to be normal but documentation of previous facial swelling or radiographs are missing.

The clinical presentation of the disease in our patients was similar to the findings in other follow up studies. Radiographically the lesions appeared as multilocular cystic radiolucencies involving jaws. The disease manifested itself in childhood but did not regress even after puberty in both these cases.

Recommended therapy ranges from radical surgical reconstruction to an attitude of wait and see, the latter being preferred today. Radical surgery is absolute when disease occurs in all four quadrants. Poor results have been reported for curettage but only in early childhood where a tendency to relapse has been reported by such an early intervention due to its high growth potential and lack of complete removal of pathological tissue. A remodeling osteotomy as in fibrous dysplasia is not indicated as bone repair process is disrupted. Attempts to control this disease with radiotherapy should be rejected for risk of developing an osteosarcoma in the irradiated area. Conservative treatment is appropriate until functional or emotional disturbances demand surgical intervention. Medical therapy in the form of calcitonin is theoretically appropriate but clinical evidence is lacking so as to endorse its application though calcitonin has been shown to cause inhibition of bone resorption in cherubic tissue in vitro. However curettage in the beginning of resorption phase has been successful with/without bone graft [4, 6].

Conclusion

Cherubism is a rare benign bone disease with autosomal dominant inheritance. The signs and symptoms depend on the severity of condition and range from no clinically or radiographically detectable features to grotesquely deforming mandible or maxilla with respiratory embarrassment, impaired vision and hearing. Because of the genetically determined course of cherubism any surgical removal should be exclusively restricted to specific indications. Deterioration of visual acuity otherwise an attitude of wait and see should be preferred.

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