

## SHORT COMMUNICATION

## Cherubism—A rare case report

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### Abstract

Cherubism is a rare inherited fibro-osseous bone disease involving mainly mandible and maxilla causing prominence in the lower portion of face. A 13 yr old male child with a swelling of lower jaw since birth had bilateral multilocular radiolucencies in posterior mandible in both X-ray and CT scan. Cytology of the swelling revealed many giant cells dispersed in the stroma which was diagnosed to be cherubism. Biopsy showed large numbers of giant cells in an oval to spindloid stroma. Correlating with clinical, radiological, cytological and biopsy findings it was confirmed to be a case of cherubism. Since it is a self regressing condition after puberty no treatment was done, with a follow up every 3 months. We reported this case because of its extreme rarity.

**Keywords:** Cherubism, posterior mandible, giant cells, stroma, biopsy.

### Introduction

Cherubism is a rare disease of autosomal dominant inherited fibro-osseous bone disease affecting the jaws (Penarrocha *et al.*, 2006). Bilateral enlargement of mandible produces rounded face and swollen cheeks accompanied by upward-looking eyes. This condition gives the patient the appearance of cherubs depicted in baroque artwork hence, the name of the disease. It was first described as familial multilocular cystic disease of jaw by Jones in 1933. The affected mandible and sometimes the maxilla begin to swell in early childhood and this gradually increases until puberty (Kaugars *et al.*, 1992). Boys are more affected than girls at the proportion of 2:1 (Caballero *et al.*, 1998). Although the condition is known to regress spontaneously at puberty, surgical management is sometimes required for cosmetic reasons (Hamner *et al.*, 1969; Kaugars *et al.*, 1992). We present this non-hereditary case of cherubism due to its extreme rarity in the present investigation.

### Materials and methods

**Case studied:** A 13 year old boy reported to us with a complaint of bilateral swelling in the lower jaw since childhood. Swelling was gradually increasing in size. He had a history of toothache and discomfort at the time of tooth eruption. His family history did not include any evidence suggestive of similar complaints.

### Results

Physical examination revealed diffuse, symmetrical enlargement of both the jaws, with ill defined margins, extending antero-posteriorly from the angle to parasymphysis region of the mandible on both sides roughly measuring 3 x 1 cm in size (Fig. 1). There were no secondary changes like ulcer or sinus and no discharge. The swellings were firm in-consistency, non-tender and there was no pressure effect.

Fig. 1. Patient's face showing symmetrical swelling of the cheeks and mandibular angles.



Skin over the swelling was pinchable and swellings were immobile. The sub-mandibular and cervical lymph nodes were not palpable. Posteriorly the buccal vestibule was slightly obliterated bilaterally with unerupted second molars. Occlusal radiograph revealed bicortical expansion of the posterior mandible bilaterally. Panoramic and postero-anterior view of the skull revealed bilateral multilocular radiolucencies in the posterior mandible with anterior displacement of first molar (Fig. 2). Computed topography (CT) scan of the mandible showed well defined, bilateral, multilocular expansile hypodense lesions with moderate enhancement of the soft tissues within it, displacing first mandibular molar anteriorly (Fig. 3). All available laboratory data were within normal limits including serum calcium, alkaline phosphate and prolactin. The fine needle aspiration cytology of the face swellings showed oval to spindiloid stromal cells in small clusters with large number of multinucleated osteoclastic giant cells (Fig. 4). The case was cytologically diagnosed as cherubism.

Fig. 2. Panoramic radiograph of the jaw showing multilocular osteolytic bilateral lesions in the mandible.



Fig. 3. CT scan showing bilateral, multilocular, expansile, hypodense lesions involving mandible displacing the first mandibular molars anteriorly.



Fig. 4. Cytosmear showing a multinucleated giant cell and oval to spindle stromal cells (Leishman x 40).

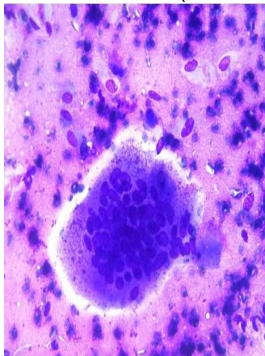
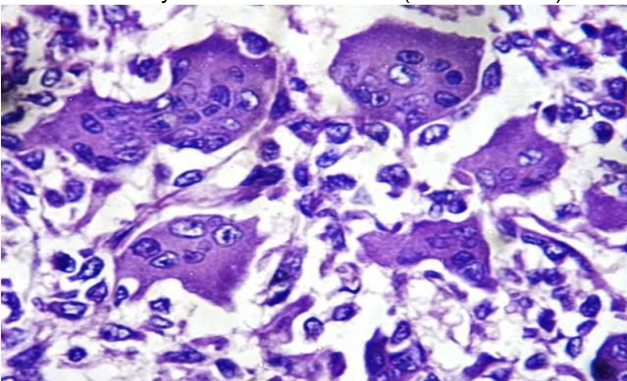


Fig. 5. Biopsy showing multinucleated osteoclastic giant cells in moderately loose fibrous stroma (H and E x 40).



Gross received was multiple bits of greyish white tissues together measuring 1 x 0.5 x 0.5 cm. Microscopic examination showed multinucleated osteoclastic giant cells over a round to spindle stroma (Fig. 5). The diagnosis of cherubism was confirmed from the histology correlating with the history, clinical, radiographic and cytological findings. Since it is a self regressing condition repeated follow up every 3 months was advised.

## Discussion

Cherubism is a rare hereditary fibro-osseous childhood disease characterized by bone degradation and fibrous tissue replacement at the angle of mandible and tuberosities of maxilla leading to the prominence of lower face (Gomes *et al.*, 2005). According to WHO classification, cherubism belongs to the non-neoplastic bone lesion group involving mandible. The disease can also be referred as familial or hereditary fibrous dysplasia, bilateral giant cell tumor or familial multiloculated disease (Ozkan *et al.*, 2003). Affected children are normal at birth. Progression of the disease usually slows down by the age of 5 years and stops at the age of 12 to 15 years. When the patient reaches puberty, the osseous lesion of cherubism regress spontaneously. But, the underlying cause of this regression is unknown (Beaman *et al.*, 2004). The widely accepted theory for the pathogenesis of cherubism is the perivascular fibrosis leading to the mesenchymal disorder and decreased oxygenation. A molecular pathogenesis has been proposed, with detection of a mutation in the gene encoding SH3-binding green fluorescent protein 2 (SH3BP2) (Li and Yu, 2006). Mineral metabolism is normal in patients with cherubism, and serum levels of calcium, parathyroid hormone (PTH), parathyroid hormone related peptide (PTHrP), calcitonin and alkaline phosphatase (ALP) are typically within normal range (Southgate *et al.*, 1998). Serum levels for alkaline phosphate may be increased during the active stages of cherubism (Ozkan *et al.*, 2003). Serum phosphate may also be increased. Biopsy and histopathologic examination are not required in most cases to establish the diagnosis of cherubism as it was diagnosed cytologically in our case. However, when performed, numerous osteoclast like multinucleated giant cells in a moderately loose fibrous stroma are present. Perivascular eosinophilic cuffing appears to be specific to cherubism. However, these deposits are not present in many cases, and their absence does not exclude the diagnosis of cherubism as seen in our case (Lannon *et al.*, 2001). The differential diagnosis of cherubism includes fibrous dysplasia and giant cell granuloma of mandible. Fibrous dysplasia can present with similar radiographic features to cherubism, however it does not show the swollen cheeks or upward turning of eyes which is the characteristic of cherubism (Pierce *et al.*, 1996). The biopsy of the fibrous dysplasia shows fibroblastic proliferation with scattered multinucleated giant cells and bone trabeculae without osteoblast rimming in addition (Valiathan and Prasanth, 1997).



Giant cell granuloma is usually unilateral and involves patients aged 20 to 40 years. It is not inherited, does not regress in adulthood and has a predilection for the anterior mandible. Its biopsy shows dispersed giant cells in hypervascular fibroblasts and presence of foci of haemorrhage associated with hemosiderine deposition (Valiathan and Prasanth, 1997). In cherubism, eosinophilic collagen cuffing can be observed around small blood vessels. Such perivascular hyalunosus is considered pathognomic of cherubism (Davis *et al.*, 1983). The limited and symmetrical distribution of the cherubism lesions can often facilitate distinction of cherubism from these other conditions, and of course mutation analysis of SH3BP2 can confirm the diagnosis. Mild forms of cherubism without facial dysmorphology, dental and ocular involvement may not require treatment as cherubism is expected to regress spontaneously after puberty. Surgical intervention is indicated when aesthetic or functional concerns arise including nasal obstruction, proptosis or facial deformity. Options for surgical management include partial resection, contour resection, curettage or a combination of these (Papadaki *et al.*, 2005). Surgical procedures should be performed after puberty when the lesions are quiescent. Experimental use of calcitonin for the treatment of cherubism has been suggested (Southgate *et al.*, 1998). In our case, the patient showed improvement in a regular follow up in every 3 months interval.

## Conclusion

Although rare, cherubism has a significant impact on affected children and their families. This is especially true in those cases where aggressive growth leads to facial deformity and functional problems. Therefore, knowledge of the clinical and radiographic alterations observed in patients with cherubism is extremely important. Counselling by a medical geneticist or genetic counsellor is recommended if family members are concerned that they may have cherubism.

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