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ORAL PATHOLOGY

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CHERUBISM.

Cherubism is a rare disease of autosomal dominant inheritance. In other words, it is a condition inherited from a mutated or changed gene and one copy of the changed gene is enough to cause the disorder. According to a Medline plus article on cherubism, mutations in the SH3BP2 gene have been identified in about 80 percent of people with cherubism. In most of the remaining cases, the genetic cause of the condition is unknown. The gene provides instructions for making a protein that plays a role in transmitting chemical signals within cells. The SH3BP2 protein is particularly important for the function of cells involved in the replacement of old bone tissue with new bone and certain immune system cells. Mutations in the *SH3BP2* gene lead to production of an abnormal protein that does not get broken down when it is no longer needed. Excessive amounts of SH3BP2 protein likely increases signaling in certain cells, resulting inflammation in the jaw bones and triggering the production of osteoclasts which are cells that break down bone tissue during. An excess of these bone-destroying cells contributes to the destruction of bone in the upper and lower jaws. A combination of bone loss and inflammation likely underlies the cyst-like growths characteristic of cherubism. Cherubism is very rare affecting only about 300 recorded cases. It is characterized by painless, cyst-like growth and bilateral enlargement of the jaws as a result of the replacement of bone with fibrous tissue. Cherubism also causes ocular/orbital and dental involvement. Orbital involvement occurs as a result of expansile fibrous tissue masses invading the floor and walls of the orbits which can cause upward tilting or displacement of the globes (Papadaki et al, p. 3, 2010). Dental involvement includes early exfoliation of deciduous teeth, impaction and/or displacement of teeth, which radiographically seem to float in radiolucent areas, conferring the so-called "floating tooth appearance". In addition, ectopic tooth eruption, agenesis of permanent teeth, mainly of the second and third molars, due to involution of their germ, and root resorption of existing teeth are observed. These changes result in maloclussion and oligodontia (Lima et al, 2010).

As stated in the previous paragraph, majority of the cherubism patients inherit the gene from a parent, however, the expression of the genotype, in the sense of what we see, clinical appearances or observable features vary from one individual to another. Some of the clinical appearances include round face (due to swelling), broad cheeks, hypertelorism, prognathism, enlargement of the submandibular nodes, maxillary and mandibular enlargement. The visibility of these features can range mild to severe depending on the individual. Radiographically, it presents as an expansile, multilocular cystic lesions in the maxilla and mandible. Cherubism begins in early childhood affecting male and females at a 2:1 ratio. The first signs of manifestation of the disease are generally observed at about 2 years of age, followed by accelerated growth from 8 to 9 years and spontaneous interruption after puberty.

Laboratory tests help further characterize cherubism although one article states, “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”. (Papadaki et al, p. 4, 2010). While a different article shows that the alkaline phosphatase might be elevated (Lima et al, 2010). Histologically speaking, cherubism lesions resemble giant cell tumors because they contain many giant-cells and mononuclear or stromal cells. The fibrotic lesions are non-neoplastic. Cherubism cannot be diagnosed by histology alone because they are not distinguishable from other giant cell lesions of bone (Papadaki et al, p. 4 2010). To diagnose of cherubism the patient’s age, family history, clinical examination, radiographic findings should all be examined.

Not all cases of cherubism require treatment or surgical intervention. Mild forms of cherubism without facial dysmorphology, dental and ocular involvement may not require treatment as cherubism is expected to regress spontaneously after puberty. Management in these cases consists of longitudinal observation. During the growth phase of the lesions, annual clinical and radiographic examination with a panoramic or other appropriate radiograph is suggested. Follow-up every 2 to 5 years is advisable after the disease becomes quiescent. Expansion of fibrous lesions in severe cases may regress well after adolescence. However, pregnancy can cause reoccurrence as it triggers the hormonal changes that occurred initially. Surgical intervention is indicated when aesthetic or functional concerns arise including nasal obstruction or facial deformity. Options for surgical management include partial resection, shaving and recontouring of the bone, curettage or a combination of these. Surgical procedures should ideally be performed after puberty when the lesions have stopped growing (Papadaki et al, 2010)

The prognosis is good as most cases of cherubism regress spontaneously after puberty. Some cases see stabilization of the lesions by twelve years of age and regression after, while a more severely affected patient can show features in their early twenties. There have been cases reported, where radiographic findings show the filling of the radiolucent lesions with bone as early as 2 years after stabilization and in most patients when they were in their twenties. In other cases, the radiolucent lesions were replaced with sclerotic bone and in more severe cases the lesion can stay the same (Papadaki et al, 2010)

Although it is a rare, hereditary condition, cherubism is well documented and the characteristics of the disease are well defined. It is painless; therefore, the only major discomfort would be the facial dysmorphia that occurs. Radiographs, family history, clinical appearances, histology all come in to play when diagnosing this condition, treatment for the most part is possible, and the prognosis are usually reassuring.

References.

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