

## Central Hemangioma

### Overview

The word "Hemangioma" comes from the Greek language. The word *hema* means "blood," *angeio* means "vessel" and the suffix *oma* means "tumor". In other words, Hemangioma is a benign vascular tumor that can be described as proliferation and accumulation of blood vessels. Histologically, Hemangioma of bone is divided on peripheral type (Hemangioma that comes from periosteum) and central or intraosseous type (Hemangioma that comes from blood vessels within the marrow spaces).

Central Hemangioma is fairly rare condition that accounts only for 0.5-1% of all bone tumors. Central hemangioma is most often found in the vertebrae and skull. It can also be found in jaws, however these cases are pretty rare. Central Hemangioma of the mandible and maxilla is not very common either. It represents less than 1 % of all bone tumors. Mandible are usually being involved twice as often as maxilla with a female/male ratio 2:1. The peak of incidence of Central Hemangioma usually falls in between second and fifth decades of life.

### Etiology

The origin and the cause of Central Hemangioma are still debatable, questionable and quite controversial. Some scientists believe that Central Hemangioma simply represents a hamartoma, a benign tumor that takes its origin from the mesodermal cells. These cells grow and undergo endothelial differentiation with later vascularization. Others, on the contrary, consider Central Hemangioma to be a true benign neoplasm of vascular origin.

Moreover, Central Hemangioma may have congenital, developmental or traumatic origin.

### Clinical presentation

Central Hemangioma looks like firm non tender slow growing bony swelling. It may be small, asymptomatic and barely noticeable. However, in some cases it may expand rapidly and may lead to massive facial asymmetry. Most patients often have no visible signs and symptoms. Central Hemangioma may takes months for the symptoms to develop and to become evident and well pronounced. At the same time, some patients developed symptoms fairly fast. These patients may complain on discomfort, sensation of pulsations, bluish discoloration of the gingiva, oozing bleeding from the gingiva of teeth in the region of the lesion, mobile teeth, and derangement of the arch as well as accelerated exfoliation of teeth. Sometimes patients suffer from paresthesia or pins and needles sensation in the region of the lesion. Central Hemangioma may also be linked with disturbance in eruption pattern, supra eruption, premature exfoliation of primary teeth and early eruption of permanent teeth.

### Demographics

Most frequently Central Hemangioma occurs in young adults in the second decade of life. In addition to that women are more susceptible to develop that condition (female/male ration 2:1).

## **Biopsy/histology/radiographs**

Central Hemangioma is a highly vascularized benign tumor that involves proliferation of blood vessels, therefore a biopsy is not usually recommended and should not be performed as a routine procedure. The reason is that the biopsy can lead to severe hemorrhage and blood loss that can become fatal for the patient. Needle aspiration can be performed instead in order to help with determination of the right diagnosis.

Histologically, under the microscope the Hemangioma looks like a proliferation of endothelial cells that form an intervencent arrangement of vascular spaces. These spaces are classified as capillary, cavernous or mixed. Cavernous spaces have thin walls. Moreover, they are usually lined by a single layer of endothelial cells that scattered and dispersed among bony trabeculae. The capillary type is characterized by fine capillary loops that tend to radiate outwards in a sunburst pattern. Mixed type represents the combination of both.

Central Hemangioma has three stages of its development:

1. An early stage. At this stage Central Hemangioma is extremely vascular
2. An intermediate stage is characterized by blood clots formed in cystic areas
3. A terminal stage or the stage of ossification

Central Hemangioma have various radiographic appearances. It may look like a unilocular lytic lesion, a well-defined cystic space with a sclerotic rim, a bony trabeculae that radiates from the center of the lesion. It also may have honeycomb or soap bubble appearance. However, in 50% cases Central Hemangioma presents as multilocular radiolucency in the posterior third molar ramus area.

## **Differential diagnosis**

Central Hemangioma is called a great mimicker or imitator, because it may resemble and simulate other conditions and tumors and, therefore, may be confused with them. Radiographically it may look like osteosarcoma, fibrous dysplasia, central giant cell granuloma, odontogenic myxoma, ameloblastoma, multiple myeloma, odontogenic keratocyst and dentigerous cyst. Moreover, it resembles central arteriovenous fistula, aneurysms and a shunt. The unilocular lesion may be confused with other cystic conditions.

## **Treatment**

There are different types of procedures available nowadays for Central Hemangioma treatment. However, the size of the lesion, its location as well as the age of a patient determine how successful a particular treatment will be. In order to make the right decision upon a treatment options, every health care provider should take in consideration the need of proper hemorrhage control, eradication of the lesion and prevention of lesion reoccurrence. The treatment of Central Hemangioma may include noninvasive radiotherapy, injection of sclerosing and embolizing agents, steroid therapy, surgical curettage and replacement of resected area with iliac bone graft, carbon dioxide and argon laser therapy. The risk of uncontrolled bleeding is very high, therefore all pros and cons should be weighted before implementation of any treatment plan.

For a very long period of time surgery with radical excision was the only treatment of choice for Central Hemangioma. However, this type of treatment is not ideal anymore. It is characterized by

heavy hemorrhage and severe blood loss, especially in cases when this procedure is carried out solely.

Therefore, new options for treatment of Central Hemangioma were developed and applied. For example, radiotherapy and lasers are found to be useful to decrease the size of tumor. However, they both have multiple adverse effects such as considerable damage to the normal adjacent tissues and residual scarring. Therefore, radiotherapy is not the best treatment and it is considered to be the least acceptable therapeutic option. The use of sclerosing agent is efficient, however it is very limited, because it is restricted to superficial soft tissues only. In cases when a patient cannot have a standard surgery or when lesions are too big, medical professionals need to perform embolization of major afferent vessels that supply blood to Central Hemangioma. Embolization is the type of procedure that reduces or blocks blood flow in required area. One of the best treatment options for Central Hemangioma are surgical curettage alone or in combination with embolizing agent. However, serious precautions should be taken during the procedure, because surgical curettage may lead to uncontrolled bleeding and heavy hemorrhage as well as incomplete excision of the lesion may take place. In some cases radical excision and resection of a jaw are still needed to be performed. However, this radical procedure needs to be followed by immediate reconstruction and bone grafting procedure.

### **Prognosis**

Central Hemangioma has great prognosis in cases when the proper management and treatment are performed in a timely manner. In addition to that, Central Hemangioma has low rate of local recurrence.

### **Professional relevance**

Dentist and dental hygienist need to be careful and mindful when treating a patient who presents with Central Hemangioma or any type of tumor or swelling. Any invasive procedure performed negligently or without a proper diagnosis may lead to terrible and irreversible consequences. Therefore, before initiating any type of treatment, multiple investigations should be carried out. Patient's medical history should be thoroughly reviewed, careful assessment should be performed, patient should be interviewed and radiograph needs to be taken. Even though Central Hemangioma is a benign tumor, it may behave aggressively sometimes and it is capable to move and to resorb teeth. Therefore, simple tooth extraction, as well as teeth cleaning, scaling and root planning procedures may be risky. Large blood vessels that feed Central Hemangioma may get damaged during dental procedures that will lead to severe hemorrhage and pose a significant risk to patient life and health.

### **Bibliography**

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