Case Report

The using of biphasic calcium sulfate in two-stage treatment of odontogenic fibroma of the mandible – case report

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Introduction

Among the patients of the Oral Surgery Department, a significant percentage are people requiring treatment due to the diagnosis of odontogenic cysts in the jaw bones. Most of these cysts, of various etiologies, require surgical treatment. The most common lesions of various origins include the germinal cyst, while the broadly understood root cyst, as a chronic inflammatory pathological condition, may constitute the highest percentage of recognizable lesions of this type in the jaw bones. Statistically, it is over 60% of odontogenic cysts and over 50% of bone cysts[1,2].

Various methods are used in the surgical treatment of odontogenic cysts; from savers through aggressive to extremely rarely radical. In the group of sparing methods, an interesting alternative to the well-known marsupialization is a two-stage treatment, in which cyst decompression is used first. It consists in making a decompression hole through all tissue layers, including the cyst wall, which is obligatorily verified by histopathological examination. The created hole is secured with a rubber drain and then an acrylic obturator is made, which may be a part of a prosthesis or orthodontic appliance. The obturator protects the created opening and allows the bone to slowly rebuild after the pressure inside the cyst cavity is removed. This stage of the procedure is also known as Drozdowski's modification. After an appropriate period of time and the reduction of the lesion volume is achieved, curettage of the remaining cysts is performed in conjunction with peripheral mechanical bone curettage. The entire biopsy is verified histopathologically. A wide panel of available bone substitutes can be used for bone cavity augmentation [1-6].

Bond Apatite® (Augma Int.) is an interesting biomaterial used in bone surgery in terms of its physicochemical properties. The material consists of fine-grained crystals of biphasic calcium sulfate and macro-grains of synthetic hydroxyapatite. Biomaterials with a similar chemical composition are well known to science. The first use of cement containing biphasic calcium sulfate dates back to 1892. However, the innovation of Bond Apatite® is a simple procedure to use. Well, the material is contained in a disposable sterile syringe with a capacity of 1 cm³. After an appropriate shift of the plunger, the physiological saline solution is introduced into the solid components. After such activation, a strong chemical reaction takes place between saline and calcium sulfate within a few minutes, where it becomes hydrated. As a result of this reaction, the material takes on the consistency of hardening cement, and what is extremely important, without the release of thermal energy. The augmentation procedure does not require the use of barrier membranes and tight closure of the flap, which significantly simplifies and shortens the procedure, and also reduces the risk of inflammatory complications related to the exposure of the augmentate after suture separation or soft tissue shrinkage. The manufacturer allows a gap of up to 5 mm between the wound edges, which is important, for example, in "socket preservation" procedures. According to the authors, the material maintains the desired shape within bone defects and is a significant alternative to classic granules or bone grafts [7-9].

So, the authors would like to present a case of two-stage treatment of odontogenic fibroma of the right corpus and branch of the mandible. Bond Apatite® was used in the regeneration of the bone defect.

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Male patient, age 43 years. In the right side of the cheek and lip the first symptoms were a swollen, pain and Vincent symptom and of course another inflammation signs. The patient had earlier not so big swollen and pain from time to time (Fig.1). We make a two-steps treatment. First step in local anesthesia was a decompression of the cyst including a extraction of impacted tooth 48) and fixation of the drainage for 7 days(Fig 2-5). We also take a sample to histopathology (diagnosis: dentigerous cyst). Than the obturator was done and we observed clinically and radiologically the status in 9 months follow-up (the clinical control was done once a month, and X-rays after 3,5,7 and 9 months, Fig.6). The Vincent symptom was dissapeared spontaneously after 3 months.
Figure 1: X-ray on the beginning

Figure 2: Fixed drainage

Figure 3: Control x-ray with drainage

Figure 4: Obturator

Figure 5: Obturator inside the tumor

Figure 6: Control x-ray 9 months
**Figure 7:** Second step of surgery. Bone defect after tumor removal.

**Figure 8:** Histological structure of the tumor. H&E staining, focus 100x.

**Figure 9:** Bond apatite inside the defect - 5 cc was used.

**Figure 10:** Control X-ray 7 days after surgery.

**Figure 10:** Control X-ray 4 months after surgery.
After this time we do the next step of the treatment. In global anestesia we removed this pathological lesion (sended all to the histopathology, confirmed as a odontogenic fibroma in the beginning of growth). Moreover the peripheral bone curretage around the defect up to deep about 1 mm was done. We filled the bone defect with Bond Appatite (Hydroxyapatite+biphasic Calcium Sulphate, 5 cc)(Figure 7-11). The patient reported medium pain and discomfort in the first four days after surgery. We take out the sutures and correct the overdenture after 7 days. In next 4 months follow-up we observed very good bone remodeling and keeping the shape of the bone defect(Fig.12). No inflammatory symptoms was observed and until now patient reported no clinical symptoms.

**Conclusions**

Based on this case report and own clinical experiences the Bond Appatite® formulation seems to be effective in the support of surgical treatment of benign tumors of the jaws. Moreover, its easy of clinical application and lack of the requirement for the use of resorbable collagen membranes simplifies its use and decreases material costs that may hamper patient acceptance of treatment without a decrease in expected clinical results. Furthermore, soft tissue flap elevation and manipulation is not necessary to get complete primary wound closure without compromise to clinical results. Biphasic Calcium Sulfate, comparable with other osseous graft materials, at the 6 month follow-up, a high clinical effectiveness was observed.

**Reference**