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Reconstruction of an inflammatorily infiltrated globulomaxillary cyst

Use of a gentamicin collagen cone

After cystectomy of intraosseous cysts, there is the problem of treating the remaining bone defect in such a way that healing by means of organisation of the blood coagulum does not show any problems. The chances of healing decrease with the increasing size of the cyst and with inflammation.[6,7,11,12]

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■ In certain cases, the application of a special gentamicin collagen preparation (PARASORB® Cone Genta, RESORBA Medical GmbH, Nuremberg) may support primary wound healing. The objective of the treatment of jaw cysts is to completely eliminate the disease and achieve restitutio ad integrum to the greatest possible extent and exclude any other pathologic processes.[3] In principle, this objective can be achieved by open postoperative care with preservation of the capsule of the cyst (cystostomy) or by complete removal of the capsule of the cyst with subsequent compact wound closure (cystectomy).

The significant disadvantages of the cystostomy include long follow-up times and, above all, incomplete removal of the capsule of the cyst, resulting in the risk of not detecting malignant processes, particularly with extensive cysts. Thus, cystectomy is generally preferable. Partsch pointed out that the success of this surgical technique is highly predictable for cysts with a diameter of up to 2 cm, and that an aseptic method is decisive for complication-free healing by means of the blood coagulum.[6] Starting at a critical size of approx. 2 cm, retraction-related tearing off of the fibrin fibres from the bone wall in the bone cavity may occur. The pressed-out serum then forms a marginal insulating layer that prevents the fusion of the coagulum by connective tissue and correspondingly increases the risk of a secondary infection.[12] Attempts have been made to fill the bone cavity for stabilisation of the blood coagulum to prevent this risk. Various methods were recommended such as the use of denatured gelatine spongiosa with addition of penicillin and thrombin.[3] Schulte recommends use of a dense blood suspension in place of the native blood.[13] However, with this method, the gelatine spongiosa may cause undesirable granulomatous tissue reactions.[3] Autogenous spongiosa is a highly tested filling material with extraordinary osteoinductive potential; in case of large cysts, it is the

Fig. 1


Fig. 2

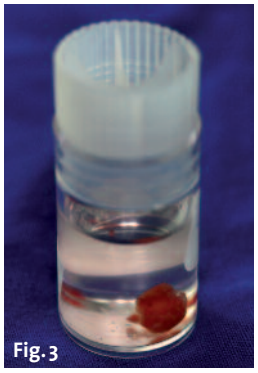
Fig. 3

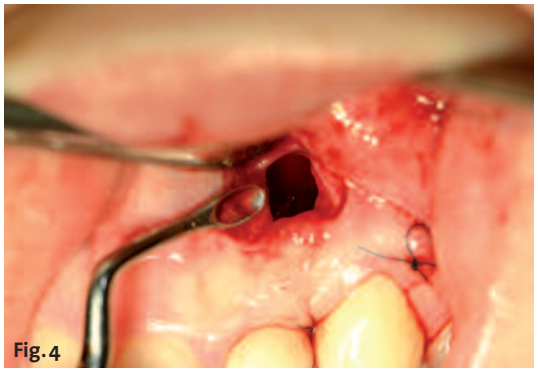
Fig. 4

material of choice.[14] However, this method is connected to a complex extraction technique. For xenogenous collagen (collagen fleece), high primary healing rates (approx. 81–94 %) have been stated in connection with exclusive use or use in combination with allogenic fibrin glue.[1,4]

Given this background, cysts with a critical size of approx. 2 cm provide an indication for use of a special collagen cone of equine origin that includes an antibiotic addition for protection against infection (Fig. 1).

The PARASORB® Cone Genta is a cone-shaped implant (Ø 1.2 cm, height 1.6 cm) made of equine collagen (22.4 mg equine native collagen fibrils) that offers high product safety thanks to its origin and quality.[8] The cone contains the aminoglycoside antibiotic gentamicin (16 mg gentamicin sulphate) for protection against infection; this also allows use in contaminated wounds. This antibiotic has a broad spectrum.[5] Due to the local use, high initial levels are achieved at the implantation site; however, these levels do not cause a toxic serum level in the whole organism.[10] If a collagen cone is inserted into an alveolus or a cyst defect, then the material soaks and becomes saturated with blood, immediately resulting in thrombocyte aggregations at the collagen fibres; this triggers the coagulation reaction.[15] This controlled haemostasis both prevents formation of a wound haematoma susceptible to infection and stabilises the blood coagulum. Then, PARASORB® Cone Genta serves as osteoconductive and angioconductive guide that actively enables migration and attachment of actively dividing cells and correspondingly supports the bony healing of the defect. The collagen is fully resorbed.[15]

Critical assessment of the globulomaxillary cyst

The so-called globulomaxillary cyst is defined as a cyst formed in the maxilla between the lateral incisor and the cuspid. The first description was made by Thoma in 1937.[16] Recent research questions the definition of the globulomaxillary cast as being an independent entity. Correspondingly, it is no longer included in the WHO classification of head and neck tumours. It is also no longer mentioned with odontogenous cysts (WHO 2005). Today, the term "globulomaxillary" is used instead for anatomic localisation of a lesion occurring in the maxilla between the lateral incisor and the cuspid. Thus "globulomaxillary cysts" should be classified as odontogenous cysts, tumours, central giant-cell granulomas, haemorrhagic bone cysts or chronic infections of invaginated teeth.[2]

Presentation of case

A 13-year old patient with normal anamnesis was referred for treatment of a pear-shaped translucency between teeth 22 and 23 diagnosed as part of X-ray examination. The neighbouring teeth showed a sensitive response as well as slight tipping movement of dental axes (Fig. 2).

Given the suspected diagnosis of a "globulomaxillary cyst", periodontal probing under infiltration anaesthesia (Ultracain® D-S forte, Aventis Pharma, Frankfurt am Main) was performed first to exclude communication of the osteolysis with the sulcus of a neighbouring tooth. Intrasulcal incision was selected for presentation of the alveolar border to ensure good overview in case

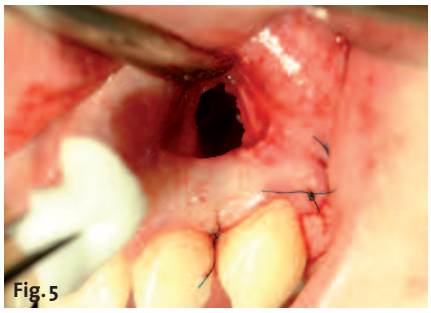
Fig. 5

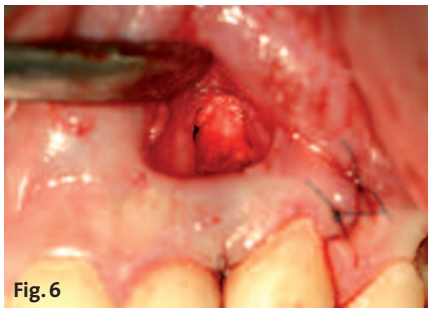
Fig. 6


Fig. 7


Fig. 8


Fig. 9

of any possibly required periodontal restoration. After ensuring that there was no drainage duct to the sulcus, adaption of the wound edge was performed by using polyamide sutures (Resolon® 4/0, RESORBA Medical GmbH, Nuremberg). Subsequently, the bone was exposed in small areas during an arch-shaped incision in accordance with Partsch to avoid large-area denudation of the thin vestibular bone lamella. After careful trepanation in the area between the roots of the vital neighbouring teeth, the capsule of the cyst was fully resected and forwarded for histological assessment (Fig. 3). The defect was inspected after rinsing with physiological saline solution. The pear-shaped cavity with a size of approx. 16 mm x 10 mm showed complete bony confine (Fig. 4).

Although complication-free healing can be assumed up to a critical cyst diameter of approx. 2 cm, we decided to apply a PARASORB® Cone Genta for improved stabilisation of the blood coagulum and for prevention of any possible germs (Fig. 5 and 6). Finally, saliva-tight suture closing was performed (Resolon® 4/0, company RESORBA Medical GmbH, Nuremberg; Fig. 7).

Upon removal of suture after one week, the wound conditions were nonirritated. The histological assessment of the excised material showed a capsule of a jaw cyst with multi-layer non-keratinised squamous epithelium that—as assumed clinically—showed highly inflammatory infiltration. The clinical findings of a further inspection performed seven months postoperatively were also normal (Fig. 8). Teeth 22 and 23 still showed a sensitive response. X-rays showed significant bony regeneration of the cyst cavity (Fig. 9).

Summary

In the case presented here, the stabilisation of the blood coagulum by filling the bone defect of an inflammatorily infiltrated "globulomaxillary cyst" with a gentamicin collagen cone (PARASORB® Cone Genta, RESORBA Medical GmbH, Nuremberg) resulted in complication-free bony healing with maintaining of vitality of the neighbouring teeth. Besides the osteoconductive and angioconductive properties of the collagen, the antibacterial effect of the gentamicin also contributed to the success. As the histological examination confirmed the clinical suspicion of a bacterial colonisation of the capsule of the cyst, it can be assumed that the wound area had been contaminated at the time of compact closure by means of suture. Primary wound healing occurred even without further systemic antibiosis. The described method for regeneration of cyst defects only represents a low burden to the patient due to the low surgical efforts. The equine origin of the used collagen further ensures high product safety. Further research would be desirable to confirm the promising results in connection with the reconstruction of small jaw cysts by using gentamicin collagen implants. ■

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