



Method of Plasty of the Lateral Wall of the Maxillary Sins in Sinus Lifting

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ABSTRACT

The study involved 18 patients with defects in the dentition and severe atrophy of the bone tissue of the upper jaws in the distal sections. For plasty of the lateral window of the maxillary sinus after sinus lift, a brefoxeno graft from the bone tissue of newborn lambs was prepared. The preoperative X-ray examination included CBCT, which made it possible to determine not only the geometric and density parameters of the bone tissue of the alveolar process and VChS, but also the condition of the sinus mucosa. The preserved xenobone was modeled with surgical scissors to a size that covered the window in the lateral wall of the maxillary sinus. According to micrographs, during densitometry, the restoration of bone tissue fibers was assessed. Analysis and comparison of micrograph data on the 30th, 90th and 180th days after the operation showed signs of bone tissue regeneration in the defect zone, which is confirmed by an increase in mineral density (by 0.193; 0.099; 0.086 g/cm³).

Keywords:

Sinus lift, bone defect, demineralized lamb bone, graft.

Introduction. An increase in the insufficient volume of bone tissue in the area of the bottom of the maxillary sinus is a predictable and effective procedure aimed at creating conditions for the installation of implants. When planning a sinusliftin operation, one often has to face various problems (T.G.Robustova, 2003; Daminov R.O., 2011; Starostina A.E., 2016; Pivovarov N.A., 2018; Amkhadova M.A. et al., 2019) that limit surgeons. One of the main disadvantages of the operation – traumatic and extensive destruction of the anterior-outer wall of the ESF – is the cause of the formation of mucous cords, which subsequently grow through the sinus defect and together with the scars form domed retractions in the sinus, leading to relapses of

chronic maxillary sinusitis (Yaremenko A.I., 2015; Lee K.C., 2010). The bone defect after radical sinusotomy, as well as during sinus-lifting, does not regenerate, maintaining a sufficiently large diameter – up to 5 mm, sometimes up to 8 mm, through which the membrane of the HPV is scar-soldered to the tissues of the cheek and the under-eye area, forming retracted scars. Complications reach about 80% (Chergestov Yu.I. et al., 2016; Magomedov M.M., Zeynalova D.F., Magomedova N.M., 2016). To eliminate the above complications, various methods of plastic surgery of trepanation holes are proposed (Harutyunyan K.E., 2005; Petukhova P.V., 2004; Privalov S.Yu., 2008). There are a number of methods for plasticizing postoperative defects

of the anterior-outer walls of the ESF using auto- and allografts, corundum ceramics and carbon materials, implants made of porous titanium nickelide, biopolymers, autostructures and others (Migura S.A., 2010). Some authors suggested using cartilage, a lyophilized dura mater, for plasticizing a defect on the lateral wall of the HPV, which, in their opinion, is replaced by connective tissue over time. However, subsequent scientific studies have shown that the use of allografts has a significant drawback: being deprived of the mucous membrane from the sinus, they are not protected from infection and are unreliable in terms of the development of inflammatory processes in the postoperative period. Taking this into account, the issue of finding and developing high-quality materials with high mechanical characteristics and not requiring subsequent removal remains very relevant at present. Based on this, the demineralized bone of the lamb is of interest. An analysis of the scientific literature on this issue did not reveal a consensus on the plastic of the lateral window during sinus lifting, which was the reason for this study.

Materials and methods of research

The study involved 20 patients with dentition defects and pronounced jaw bone atrophy in the distal parts of the upper jaw, of which: men - 9 (45%), women - 11 (55%). All patients (n=20) underwent a standard clinical and laboratory examination.

For plastic surgery of the lateral window of the maxillary sinus after sinus lifting, we prepared a brefoxeno-graft from the bone tissue of newborn lambs, demineralized by the method of V.I.Savelyev and preserved by the method of V.F.Parfentieva. The preparation of the graft was carried out from the flat and tubular bones of newborn lambs of Karakul sheep in the first 5 days from the moment of birth. The simplicity of harvesting demineralized lamb bone in non-sterile conditions, an unlimited amount of raw materials, gives access to use by a wide range of practitioners.

Preoperative X-ray examination included CBCT, which made it possible to determine not

only the geometric and density parameters of the bone tissue of the alveolar process and the ESP, but also the condition of the sinus mucosa. During the diagnostic endoscopic examination, edema, hyperemia of the mucous membrane, the presence of pathological discharge in the OMC area were detected in 23 (56%) patients. In 12 patients, our study revealed uniform thickening of the mucous membrane along the bottom from 3.2 mm to 4.2 mm. The residual bone defect varied from 1.5 to 3.8 mm, the thickness of the scar-altered strands ranged from 3.8 to 4.4 mm. To prevent such postoperative complications, we have developed and proposed a method of plastic sinusotomy using xenocyt and pins. The preserved xenocyt was modeled with surgical scissors to the size of the overlapping window in the lateral wall of the maxillary sinus. Usually, a demineralized compact plate of the skull of lambs with a thickness of 1.5 - 2 mm was used. The graft was carefully transferred to the site of the defect and fixed with pins. The detached muco-periosteal membrane was sutured with vicryl No. 4.

Research results

According to micrographs, densitometry was used to assess the restoration of bone tissue fibers. Analysis and comparison of micrography data on the 30th, 90th and 180th days after surgery, signs of bone tissue regeneration in the defect area are noted, which is confirmed by an increase in mineral density (by 0.193; 0.086; 0.099 g/cm³). When using xenocyt and pins, islands of newly formed young are visualized over the defect area starting from 60 days bone tissue and fully formed bone tissue is visualized by 90 days. When using xenocyt and pins, after 3 months there is a complete replacement of the bone defect with osteoid tissue with the formation of bone beams located randomly and anastomose with each other. Osteocytes are detected on the surface of osteoid beams. In the area of the formed bone tissue, the processes of bone tissue structuring from the edges of the defect to the center are observed. After 180 days in this study group, the presence of fully formed bone beams arranged in an orderly manner is noted in the defect zone. All bone

structures are formed correctly, well differentiated. Thus, the osteogenesis process occurs most intensively in the main group and is fully completed by 6 months with the formation of mature bone tissue. Based on the conducted research. The use of xenocity and pins to accelerate bone regeneration in accordance with the principles of directed tissue regeneration has now become possible to eliminate lateral bone defects of the maxillary sinus wall during sinus lifting. Xenocost slowly dissolves in the human body, no repeated surgery is required to remove the latter. According to the data obtained, sinus lifting using xenocity and pins to close the anterior-external window is the optimal treatment method. In addition to ease of use, the method is distinguished by the duration of the period of material resorption, stability of fixation, plasticity, and the absence of toxic effects on the body.

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