

MACROSCOPIC DESCRIPTION OF THE EXTRACTED ALVEOLAR SOCKET HEALING IMPLANTED WITH «BYOSSITAL - 11» AND «KAFAM» IN EXPERIMENT

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[Engineering of Biomaterials, 99-101, (2010), 8-9]

Introduction

Search of possibilities of the optimal conditions formation for predictable regeneration of the bone tissue of maxilla at the region of operation is an actual problem of the modern maxillofacial surgery [4].

Its decision should follow by two ways: elaboration and introduction of new materials stimulating osteogenesis at the region of the bone tissue defect of the maxilla [1, 2] and acupuncture application for the osteogenesis at the region of defects of maxilla with implanted into them effective substitutes of the autogenous bone graft. In spite of the fact that the process of the bone tissue formation is considered as determinate reaction of the organism [4], its activation remains a non-resolved problem up till now.

Complex approach to this problem solution should include two aspects of scientific examinations: experimental and clinical which give opportunity to make objective conclusions about positive processes of the osteogenesis and its application in clinics for raising of the patients treatment quality.

Aim of the work was to study macroscopic description of the extracted alveolar socket healing implanted with «Byossital - 11» and «Kafam» in experiment.

Materials and methods

Experimental examinations were performed on rabbits of the Shinshilla breed with weight $2,0 \pm 0,4$ kgs.

We performed the examination on the 8 outbred dogs according to the «Regulations for the work with experimental animals» approved the MSMU Board on the 24.04.1996 and requirements regulating the experimental animals use. Standards of American Heart Association's «Guidelines for the Use of Animal in Reserch» и Guide for the care and Use of Laboratory Animals (National Academy Press, Revised, 1996) [3, 5] were used when invasive procedures were applied.

Method of the experiment

The gum was separated at the region of the incisor teeth under intravenous anaesthesia and local anesthesia with sol.novocaini 2%-2 ml than the teeth was extracted and bone edges were planed by conical dental cutter. The tooth hole was treated with 3% Solution of hydrogen peroxide, 0,05% Solution of chlorhexidine gluconate. The wounds of all animals were treated with antibiotics of large action spectrum. The tooth hole was filled in by the blood clot

mixed with powder of 0,5% lincomycin at the first run (9 animals), by «Byossital-11» at the second run (9 animals), by «Kafam» at the third run. Wounds after operation were sewed up with «Etikon 000». Experiment was performed with animals of II and III runs and the I run was the control one. Clinical observation (macroscopic description of the tooth hole healing) of all animals was made 7, 14, 21 days and 1, 6 months after the operation.

Results

Animals of the I group had feebly marked edema of the mucous tunic of the alveolar appendix of the lower jaw at the region of the sew up teeth hole 7 days after the operation. Animals of the II and III groups had no inflammation edema of the mucous tunic of the alveolar appendix and holes of extracted tooth. The sutures were of good state, after operation wounds closed up with the primary intention for these animals. A partial clot was found at the I run when bone tissue holes skeletonization. Small pieces of the bone tissue and dentine of the extracted teeth were found on the edges of the teeth wound. The tooth hole was filled in by the granulation tissue by 1/3. Animals of the groups I and III had the tooth holes filled in by the granulation tissue over the «Byossital – 11» and «Kafam». Sections of the granulated material of those implants alternated with sections of the granulated tissue often.

Animals of the group I had the mucous tunic of pink color at the region of the extracted tooth holes and the infiltration edema was moderated. Animals of the groups II and III had the mucous tunic of pink color at the region of the extracted tooth holes without visible edema of surrounding soft tissues and signs of fistula formation. During the skeletonization of the teeth holes of the I group animals the rests grumes looked well fragmented. Granulations of «Byossital – 11» and «Kafam» looked like conglomerate ball alternating with formatting granulation tissue for the animals of the II and III groups. Implantation granulation «Kafam» for some animals of the group III looked like big separated and compact forms of fragments which border upon the edges of the alveolus of the extrated tooth.

21 days after the operation the mucous tunic at the region of the extracted tooth and surrounding of the mucous tunic of alveolar appendix of the lower jaw for animals of the group I had no signs of inflammation and fistula. Afteroperation scars were tender and completely epithelized or animals of the groups II and III. When skeletonizing the extracted teeth holes, pieces of the granulations «Byossital – 11» and «Kafam» looked smaller comparing with results of the previous terms, separated by bands of the yang bone tissue reclaim of gray color.

30 days after the operation the animals of the group I had the mucous tunic of the alveolar appendix of physiological color without edema and fistula. Considerable reduction of the alveolar appendixes height at the region of the extracted tooth of the lower jaw was fixed visually. Animals of the groups II and III had no edema of the mucous tunic of the alveolar appendix of the lower jaw and fistula 30 days later. Skeletonization of the alveolar appendix demonstrated that holes looked like solid fiber tissue, granulation of «Byossital – 11» and «Kafam» were not found and destruction of the holes of those groups of animals was not also confirmed macroscopically. The height of the alveolar appendix kept at the physiological level for all animals.

180 days after the operation during the skeletonization of the extracted tooth holes of the lower jaw of the I group of animals, complete change of the defect of the bone of alveolar appendix was not fixed. The defect of the hole was

replaced by crude connective tissue macroscopically. The focuses of the periosteous reaction as a nonconsiderable bone deformation were fixed on the vestibular and tongue surface. The height of the alveolar appendix was considerably reduced in these regions. Animals of the groups II and III had the mucous tunic of the alveolar appendix of the lower jaw at the region of the extracted tooth holes filled in with the granulations of «Byossital – 11» and «Kafam» of the pink color, no inflammation, fistula and deformations found. The height of the alveolar appendix kept the physiological level and without signs atrophy. Skeletonization of the parts of the holes macroscopically demonstrated there complete filling in with regenerated mosaic bone structure.

Conclusion

It's obviously clear that macroscopic clinical control for the process of the extracted tooth holes recovery in experiment demonstrated advantages of implantation with «Byossital - 11» and «Kafam». We continue examinations of this kind.

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STRUCTURAL DISORDER OF TOOTH GERMS IN THE ANTENATAL PERIOD UNDER LOW DOSES IONIZING RADIATION EXPOSURE IN ACUTE EXPERIMENT

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[Engineering of Biomaterials, 99-101, (2010), 9-10]

Introduction

The study of ionizing radiation influence on dental system was begun with the assessment of large doses exposure during radiation therapy. Investigations of oral cavity radiolesions in general radiation exposure in low and mean doses

are not numerous [1, 2].

The aim of this work is to study odontogenesis in 20-day old animals' foetuses after a single exposure to low doses ionizing radiation.

Materials and methods

The experiment was carried out on 4-month old albino rats of mongrel gregarious breeding with initial body weight of 0,16 – 0,18 kg. Pregnant rats were exposed to external acute γ -radiation on «IGUR-1» unit (the radiation source – Cs-137, dose rate – $1,033 \times 10^{-3}$ Gy/sec) in 0,5 Gy dose on the 15th gestation day. The animals were kept at vivarium conditions. Tooth germs of rats' 20-day old foetuses were studied histologically.

Results

«Finger-shaped» tooth buds inherent to the period of tooth germ anlage and formation were still seen in the experimental animals. Thin epithelial necks connecting dental lamina with enamel organs were present. The enamel organs were large, well-formed, scyphiform, as those in the control group. But there were significant abnormalities among them. Thus, some enamel organs had poorly marked pulp. Thin outer enamel epithelium consisted of one-two condensed cell layers and disappeared at blood vessels entering it superficially (FIG.1). Such «spreading» of the enamel organ was explained by further proliferation of the cells of the focal thickening of the inner enamel epithelium, which partially replaced the outer enamel epithelium. Also there was some displacement of the enamel organ pulp. On serial sections we could observe that mesenchymal cells separated this considerable segment from the main mass of the enamel organ, so the latter took a smoother form (FIG.2).

Single giant dentinal papillae occurred more frequently, two or three of them in one tooth germ being rarer. The growth of three papillae was likely to result in the atrophy and death of the tooth germ. There were no such giant dentinal papillae in the control group.

Germs with short neck and two dentinal papillae of irregular size were especially deformed. The larger one, sagittally sectioned, was surrounded by a thick layer of the inner enamel epithelium (FIG.3). In other enamel organs with long epithelial neck the pulp was well-developed, while the dentinal papilla invaginated into the enamel organ through a small defect in its wall.

In the enamel organ, into which three dentinal papillae ingrew, the inner enamel epithelium was unevenly thickened, being more considerable in size on the apex of the medial one. Its cells infiltrated the enamel organ pulp and disappeared in it. Sometimes such a proliferation of the inner enamel epithelium cells occurred asymmetrically in one of its margins.

There were sharply abnormal structures that are sort of growing from the long neck of the underdeveloped enamel organ. Though the latter looked like scyphiform, the inner enamel epithelium was noted only on its one half. Extensive proliferation from the epithelial neck had a solid structure and consisted of fusiform cells. These structures are likely to be the second enamel organ on the common neck. In some abnormal tooth germs dentinal papillae ingrew into the enamel organs and partly destroyed both the outer and inner enamel epithelium. In some tooth germs the transition of the neck epithelium into the outer enamel epithelium was still evident, while the differentiation of such structures as the enamel organ pulp, inner enamel epithelium, basement