

**Bambuliak A.V.**

**CLINICAL EFFICIENCY OF BONE AUGMENTATION MATERIALS AND THEIR COMBINATIONS WITH MULTIPOTENT MESENCHYMAL STROMAL CELLS FROM THE PATIENT AFTER REMOVAL OF THIRD MOLARS**

*Department of Surgical Dentistry and Maxillofacial Surgery  
Bukovinian State Medical University*

Despite the active ability to repair, often the independent potential of bone tissue is insufficient, which is a serious problem in reconstructive maxillofacial surgery, orthopedics, and traumatology. The use of stem cells and tissue engineering provides an innovative approach to identifying material that can be used not only to replace lost tissue but also to improve bone regeneration.

The aim of the study was to identify the clinical efficiency of bone augmentation materials and to determine the feasibility of using tissue equivalents of bone tissue based on multipotent mesenchymal stromal cells of adipose tissue to heal bone defects in patients after removal of retinal third molars. The study was conducted at the Department of Surgical Dentistry and Maxillofacial Surgery of Bukovinian State Medical University, Chernivtsi, Ukraine. The operation impacted third molars removal was performed on 72 patients. At the same time, 31.94% of the subjects underwent bone augmentation procedure after surgery using osteoplastic material "Colapan-L" (group A); 41.67% of patients - with a combination of multipotent mesenchymal stromal cells of adipose tissue + "Colapan-L" + platelet-rich plasma (group B) and in 26.39% of patients wound healing occurred under a blood clot (group B). Postoperative pain was assessed using the Numerical Rating Scale (NRS) based on patients' subjective pain. Visual assessment of the severity of collateral edema and hyperemia of the oral mucosa after surgery was also performed. A scoring system was used to determine the severity of collateral edema. To assess the course of the postoperative period in patients of all study groups, a protocol was completed daily during the hospital stay, which reflected the most important data of an objective and subjective nature. During the morning dressings, patients' complaints, general and local status were clarified: presence of appetite, quality of sleep, wound pain, postoperative edema, hematoma, hyperemia of the oral mucosa, presence of secretions from the wound, fever, type of wound healing.

It was found that at the final stage of postoperative observation in patients in whom the bone defect was filled with a combination of the drug "Colapan-L" with multipotent mesenchymal stromal cells of adipose tissue and platelet-rich plasma, the absence of pain was noted in 89.31%,

which is 2 times  $p1 < 0.05$  and 1.3 times  $p2 < 0.05$  higher than in patients of groups A and B. Collateral edema was absent in 98.47% of operated group B, which exceeded 1.2 times,  $p1 < 0.05$  number of such persons of group A, where the bone defect was augmented by the drug "Colapan-L" and 1.4 times higher,  $p1 < 0.01$ ,  $p1 > 0.05$  indicators of group B, where the healing of the bone defect occurred without the use of bone augmentation materials. The absence of hyperemia of the oral mucosa was determined in 92.37% of patients in groups B, which was 1.3 and 1.4 times higher than the values obtained in groups A and B,  $p1 < 0.05$ ,  $p2 < 0.01$ .

A comparative analysis of the clinical efficiency of bone augmentation materials in the operation of impacted third molars extraction convincingly proved the advantage of using bone augmentation material "Colapan-L" and its combination with multipotent mesenchymal stromal cells and platelet-rich plasma before spontaneous augmentation, as evidenced by subjective and objective symptoms in patients during the postoperative period.

**Batig V.M.**

## **THE DEVELOPMENT OF EXPERIMENTAL PERIODONTITIS MODEL UNDER ANTICHOLINERGIC DRUGS**

*Department of Therapeutic Dentistry  
Bukovinian State Medical University*

The microbiome of the oral cavity plays an essential role in the development of periodontal disease. It also has a significant pathogenic effect on the innervation of the oral cavity organs. Pathogenic bacteria reach through toxins, and lipopolysaccharide is the most active among them. A number of enzymes are among toxic microbial factors, and according to their catalytic properties, they can lead to toxic effects, directing on the destruction of structural biopolymers of macroorganisms.

The aim of the paper was to develop an experimental periodontitis model under anticholinergic drugs. The development of the experimental model of periodontitis was carried out by injecting the pathogenic factors into the rats' gums: lipopolysaccharide, hyaluronidase and trypsin. The preparations were in the form of solutions of 0.9% lipopolysaccharide NaCl (1 mg / ml), hyaluronidase (2 mg / ml) and trypsin (5 mg / ml), which were injected into the gums in the molar area in an amount of 0.2 ml per rat. The study was performed on white Wistar rats (45 rats in total). The aim of the study was to investigate the effect of anticholinergic drugs (pilocarpine and atropine) on the development of an experimental model of periodontitis after administration of a solution of hyaluronidase (2 mg / ml) into the rats' gums.

The results were next: activity of the proteolytic enzyme elastase was chosen as an indicator of inflammation. The effect of three pathogenic factors (lipopolysaccharide, hyaluronidase and trypsin) on the activity of elastase in various tissues (gums, pulp, serum and gastric mucosa) was studied. According to the data obtained, hyaluronidase has the most significant pro-inflammatory effect. After recalculating the magnitude of the increase in elastase activity per 1 mg of the pathogen, it was found that hyaluronidase is more effective when acting on the gums, tooth pulp and serum.

The results of this series of experiments became the basis for the use of hyaluronidase for the experimental model of periodontitis. The effect of autonomic nervous system modulators (pilocarpine and atropine) on the development of acute experimental periodontitis after administration of hyaluronidase solution (2 mg / ml) in the gums of rats was studied in the following series of experiments (15 rats)). To do this, rats were pre-administered orally with gels with pilocarpine (2 mg / ml) or atropine (0.2 mg / ml) for two days. Rats were sacrificed 3 hours after hyaluronidase injection, gum and dental pulp were isolated, and serum was obtained.

The presence of an inflammatory process in the periodontium is evidenced by a significant increase in elastase activity (by 22.5%). The use of pilocarpine or atropine gels slightly reduces the activity of elastase, but it remains much higher compared to intact rats. Both anticholinergic drugs (pilocarpine and atropine) significantly increase the content of malonic dialdehyde compared to its level in rats with an experimental model of periodontitis.