

# **ЗДОРОВ'Я ЛЮДИНИ: ТЕОРІЯ І ПРАКТИКА**

**Матеріали Міжнародної науково-практичної конференції,  
присвяченої 25-річчю Медичного інституту  
Сумського державного університету**

**(Суми, 17–19 жовтня 2017 року)**

За загальною редакцією О. О. Єжової



інактивації естрогенів, біогенних амінів, порушенням функції гіпофізу. Враховуючи, що порушення статевих функцій тісно зв'язане із якістю життя, доцільним є проведення опитування для своєчасного виявлення відповідних розладів та адекватної корекції їх.

УДК 616.716-008

## **SPECIAL ASPECTS OF HEALING WOUNDS AFTER TOOTH EXTRACTION IN PATIENTS WITH DIABETES MELLITUS\***

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*\*Тези доповіді. Стаття буде надрукована у  
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Diabetes mellitus is a chronic endocrine disorder which gradually exhausts compensatory and adaptive capabilities of the body. Among other concomitant diseases and complications dental caries is increasingly met, therapeutic treatment of which is not always successful. Therefore, the proportion of patients with diabetes mellitus sooner or later and requires a dental surgery such as tooth extraction. Diabetes mellitus is a major problem for maxillofacial surgeons, as well as for other specialists. This is due to the fact that regenerative processes in all tissues are slowing down against the background of metabolic, hormonal disorders, diabetic angiopathy and polyneuropathy, compared with healthy persons of the same sex and age. Moreover, toothache, pain and tissue swelling after tooth extraction can lead to a patient's failure to eat, which is very dangerous, as dieting for patients with diabetes is an important factor in compensating for the disease. For uncomplicated healing of the wells, it is necessary to monitor blood glucose and stimulate reparative processes in the postoperative wound.

In the process of phylogeny and ontogenesis, the human organism has developed an ability to restore its structure and functions. Regeneration (the ability to repair damaged and dead tissue) as a biological phenomenon is characteristic of all plants, animals and humans. Regeneration is an important manifestation of compensatory-adaptive processes that allow living organisms to survive under the influence of various environmental factors.

Researchers have found out that diabetes mellitus reduces the regenerative capacity of individual cells, tissues and organs, so there is a constant search for

local factors to accelerate the healing of post-extraction wounds. Recently, fibrin enriched with platelets (Platelet Rich Fibrin, PRF) has been used in surgical dentistry to stimulate wound healing and to accelerate reparative osteogenesis. PRF is to transfer platelets and fibrin into the alveolar socket or surgical intervention area for acceleration of angiogenesis, stimulation of the formation of fibroblasts and collagen synthesis. This is explained by the fact that platelets are blood cells containing polypeptides, the so-called growth factors. The hemostasis process (formation of blood convulsion) begins with an activation of platelets, whose growth factors are allocated to the surface of the cell. Growth factors are essential for angiogenesis stimulation. For the formation and subsequent retraction of blood convection, fibrin (an insoluble protein formed from fibrinogen (plasmic protein)) is required. The literature data indicate that fibrin also stimulates fibroblasts proliferation and a scar formation.

The purpose of our study was to investigate how the introduction of PRF into a postoperative wound affects the course of its healing after tooth extraction in patients with diabetes.

**Materials and methods.** The study involved 10 patients with Type 2 diabetes mellitus, treated in the maxillofacial department of Vinnitsa Regional Pirogov Clinical Hospital. All of them needed removal of single-rooted teeth on the lower jaw (35-45) regarding the exacerbation of chronic periodontitis. All the patients agreed to hold all necessary manipulations. In 5 patients after the tooth removal, a blood gloom was formed in the hole. In the other 5 patients PRF was placed in the well and fixed with a seam. The fibrin enriched with platelets was made immediately before the tooth removal. For this, 10 ml of blood were taken from the patient's elbow vein. The venupuncture was carried out with the use of a butterfly needle connected with a catheter to a vacuum tube.

The resulting blood was centrifuged for 12 minutes at a rate of 3000 rpm. The blood in the test tube was divided into three layers: the upper one - the plasma with deficiency trombocytes, medium - fibrinous clot, enriched with platelets, the lower layer - a clot of red blood cells.

The fibrinous clot was removed from the test tube by the tweezers, the red blood cells were cut off with a scalpel and moved into the wound.

Histological preparations were immediately prepared from a small part of the fibrinous convulsion. The sections of the fibrin convex preparation were made and stained with fibrin: orange-reddish-blue on Zerbino DD, Lukasevich LL (modified method of Martius-Scarlet-Blue), and also stained with hematoxylin-eosin.

Microscopy and photographing of histologic drugs were carried out with the help of an OlympusBX41 light microscope with an increase of 40, 100, 200, 400 and 1000 times.

The patients underwent the postoperative period under control of an endocrinologist. Daily blood glucose levels were evaluated. An overview of patients

was conducted on the 1st, 3rd, 5th, 7th and 14th days. During the survey, complaints were collected, changes in general condition evaluated, as well as local tissue changes around the post-extraction wound. To determine and compare the quality of life in the postoperative period, on the 14th day after the tooth extraction we conducted a questionnaire on adapted Ukrainian and Russian versions of the specialized dental questionnaire OHIP-14 (OralHealthImpactProfile). All the questions of the survey can be divided into three parts: the first five questions characterize problems with eating, 6 -8 questions reflect the problem of communication, and 9-14 questions - the problems that arise in everyday life.

Results and discussion. Histological examination of the fibrin convex colored with hematoxylin-eosin showed that it consists of filaments of fibrin and a large number of platelets. In preparations, there are erythrocytes, leukocytes and other elements of blood. Coloring by Zerbin DD, Lukasevich L.L. on the fibrin OCHG (orange-red-blue) showed that in the fibrinous convolution there is fibrin at different stages of ripening (from the «young» orange to the «mature» dark blue) (Fig. 4). Thus, in the form of PRF in the tooth stem, fibrin is transplanted at different stages of maturation and platelets. The first hours are still the retreat of the thrombus - the fibrin fibers are shrinking, the thrombus loses water, decreases in size. It is in these conditions that platelets are activated and the growth factors are isolated on the surface of their cells. These bioactive substances can stimulate angiogenesis and synthesis of fibroblasts. The life span of the platelet is 7-10 days, so it can be assumed that the growth factors in the PRF are released within 5-7 days. To evaluate the clinical status of each patient, we filed complaints, history data, review data for the 1, 3, 5, 7, 14th day. Particular attention was paid to the state of the post-extraction hole, estimated the prevalence of tissue edema, the condition of the mucous membrane, the contents of the well. With an objective review it turned out that the tissue swelling after tooth extraction developed in all patients, however it passed sooner in those with PRF in the well. In these patients, the mucous membranes at the edges of the well recovered more quickly and covered the edges of the wells, and, on the 14th day after the removal of the tooth, the well was filled with granulation tissue. In the control sample, one of five patients had a complication - alveolitis of the well, requiring a special treatment. This patient complained longer of pain and chewing problems after the tooth extraction. After 14 days in the wells of teeth granulation showed that in all the patients who had used PRF to accelerate the postoperative wounds healing had less problems with eating, no communication problems, which contributes to the overall improvement of the quality of life. We found no relation between the quality of life and gender and duration of concomitant diabetes mellitus.

Conclusions. The use of platelet-rich fibrin (PlateletRichFibrin, PRF) after tooth extraction in patients with diabetes mellitus promotes faster regeneration of the post-extraction well. This can be explained by the fact that thrombocytory

growth factors stimulate angiogenesis, and fibrin stimulates proliferation of fibroblasts. Clinical observations of a mild postoperative period in PRF patients coincided with the OHIP-14 survey data.

УДК 616. 314-089.23:616: 31-084. 001.86-053.5

## **ДОСЛІДЖЕННЯ СТАНУ ГІГІЄНИ ПОРОЖНИНИ РОТА ПРИ ОРТОДОНТИЧНОМУ ЛІКУВАННІ НЕЗНІМНОЮ ТА ЗНІМНОЮ АПАРАТУРОЮ\***

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Ускладненнями при використанні ортодонтних апаратів є катаральний гінгівіт, стоматит, пародонтити, випадки гіперплазії ясен та резорбції верхівок зубів, а також тріщини емалі, карієс під брекетами. Першопричиною вищеперерахованих ускладнень при використанні апаратного лікування зубощелепних аномалій може бути погана гігієна порожнини рота.

Мета дослідження. Вивчити стан гігієни порожнини рота при використанні незнімної та знімної ортодонтної апаратури у дітей з щелепно-лицьовими аномаліями.

Матеріали і методи. Дослідження було проведено серед 90 пацієнтів. Всі пацієнти були поділені на три групи: контрольну, групу з лікуванням незнімною ортодонтною апаратурою та групу зі знімною ортодонтною апаратурою. При дослідженні визначали рівень гігієни порожнини рота за допомогою спрощеного індексу гігієни порожнини рота Гріна-Вермільйона.

Результати. Стан гігієни порожнини рота в контрольній групі майже не змінювався. В групі дітей, яким використовувалась незнімна ортодонтна апаратура, через 3 місяці лікування кількість пацієнтів з доброю гігієною порожнини рота зменшилась з 15% до 5%, якою і лишалась через 6 місяців. Якщо на початку лікування кількість пацієнтів з середнім рівнем гігієни порожнини рота складала 80%, то через 3 місяці 40%, а через 6 місяців стан середнього рівня гігієни порожнини рота спостерігався тільки у 10% пацієнтів. Використання знімної апаратури для лікування ортодонтних хворих не