рівнем антитіл до тиреопероксидази планувати свою вагітність у більш ранньому репродуктивному віці (18-25 років), оскільки в цей час підтримуються оптимальні умови для народжуваності. Для жінок з клінічно незначним рівнем антитіл до тиреопероксидази планування вагітності є більш доцільним у середньому репродуктивному віці.

Ключові слова: безпліддя, антитіла, андрогенна недостатність.

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антител к тиреопероксидазе планировать свою беременность в более раннем репродуктивном возрасте (18-25 лет), поскольку в это время поддерживаются оптимальные условия для рождаемости. Для женщин с клинически незначительным уровнем антител к тиреопероксидазе планирования беременности является более целесообразным в среднем репродуктивном возрасте.

Ключевые слова: бесплодие, антитела, андрогенная недостаточность.

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RATIONALE FOR THE USE OF METHODS OF MICROSCOPIC CRYSTALLOGRAPHY IN FRACTALS OF PROTEINS AND IRRIGATION FOR THE EARLY DIAGNOSIS, TREATMENT AND PREVENTION OF INFLAMMATORY PROCESSES IN THE ORAL CAVITY

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In dentistry, new methods of prevention and treatment of diseases caused by aggressive biofilm are constantly offered. If timely oral hygiene and preventive measures are ignored or underestimated, the impact of aggressive biofilm can be irreversible and cause changes in periodontal tissues. One of the key factors that worsen the general state of oral health is the presence of removable and fixed dentures in patients. This is because soft dental plaque forms much faster on the surface of implant. Today, one of the most effective and optimal methods used for the prevention and treatment of inflammatory processes in the oral cavity is irrigation. We examined a total of 90 people. The age of the patients ranged from 40–60 years. Of these, there were 40 men and 50 women. Analyzing the value of the protein fractals, namely the area, we assessed and confirmed the hygienic condition of the oral cavity in people with dental protheses. An application of the periodontal tissue irrigation method for fixed dental protheses leads to a decrease in the percentage of protein fractals area in the digital crystallography samples. The results are confirmed by statistical and clinical data.

Key words: microscopic crystallography, irrigation, oral cavity, periodontium, metal-ceramic fixed dental prostheses.

The work is a fragment of the research project "Restoration of dental health in patients with major diseases and their rehabilitation", state registration No. 0116U004191.

Hygienic condition of the oral cavity directly affects the development of periodontal disease. One of the leading negative factors is dental plaque. At the initial stage, it contains aerobic microorganisms that demineralize the enamel. The mature dental plaque is dominated by anaerobic bacteria associated with the etiology of gingivitis and periodontitis. Such bacteria penetrate into the gingival pockets, secrete toxins and enzymes that lead to the destruction of periodontal tissues [1].

In dentistry, new methods of prevention and treatment of diseases caused by aggressive biofilm are constantly offered. If timely oral hygiene and preventive measures are ignored or underestimated, the impact of aggressive biofilm can be irreversible and cause changes in periodontal tissues. One of the key factors that worsen the general state of oral health is the presence of removable and fixed dentures in patients. This is because soft dental plaque forms much faster on the surface of implant [5, 6].

Poor oral hygiene significantly reduces the life of dentures, and subsequently leads to periodontal disease.

The study of biofilms formed in the natural habitat revealed significant differences between planktonic and biofilm forms of microbiota, including differences in bacterial behavior, biochemical processes, biosynthesis of various products, information exchange, including genetic one. Obviously, biofilms can promote the transfer of resistance genes to antibiotics and to various chemical biocides. As a result of inflammation initiated by biofilm microbes, the pH in the gingival sulcus increases and can accelerate the growth and proteinase activity of some periodontal pathogens by activating the processes of gene expression [2, 3, 5].

This helps to understand why systemic antimicrobials that are applied topically are not always effective, even in cases where the antibacterial drug is selected by the spectrum of its action and activity on a particular type of periodontal pathogens. The latter allows us to explain why mechanical dental plaque removal and hygienic measures (personal and professional hygiene) are the most important component of comprehensive treatment of patients with periodontal disease in practical dentistry.

Taking into account the data of domestic and foreign sources for application of fixed dentures, namely porcelain-fused-to-metal crows, has a connection with the risk of activation of pathogenic mechanisms which cause in the periodontal tissues localized, and with timely diagnosis, an inflammatory process, which can be treated in the initial stages of detection [4].

According to the literature, to date, one of the effective and optimal methods used for the prevention and treatment of inflammatory processes in the oral cavity is irrigation [7, 8].

The positive irrigation effect on periodontal tissues is explained by the fact that the specific interaction of the organism and microbes is disturbed, which is what leads to the elimination of signs of inflammation in the oral tissues.

The main effect of modern irrigators is the ability to mechanically eliminate aggressive biofilm, microbial cells and food particles by washing it all down with a regulated water flow, and further resist its formation.

Timely diagnosis of periodontal diseases, full assessment of treatment results in the near and long-term periods, and most importantly – preventive measures to ensure good oral hygiene are becoming an urgent problem in modern dentistry.

The purpose of the study was to rationale for the use of methods of microscopic crystallography in fractals of proteins and irrigation method for the early diagnosis, treatment and prevention of inflammatory processes in the oral cavity.

Materials and methods. Patients were divided into groups according to the presence of fixed dental protheses, namely porcelain-fused-to-metal ones. We examined a total of 90 people. The age of the patients ranged from 40–60 years. Of these, there were 40 men and 50 women.

All patients applied to the UMSA Department of Postgraduate Education of Dentists and to the Orthopedic Department of the Scientific-Educational-Medical Dental Center where they underwent a full preventive examination and further treatment.

The criteria for the distribution of the studied patients were: the term of use of dental protheses, the presence of dentition defects and periodontitis of I-II degree.

The group formation was as follows: Group number 1 – numbered 29 people. The term of dentures using was less than 4 years. The second group included persons in whom dental protheses were used for more than 4 years.

Crystallographic image of rinsing from the oral cavity in patients with fixed dental protheses (fig. 1).

Fig. 1. Samples of protein fractals in the crystallographic image of oral fluid.

Statistical data processing was performed using the Satus sETT 10 software package tool.

Analyzing the value of the protein fractals, namely the area, we assessed and confirmed the hygienic condition of the oral cavity in people with dental protheses.

The oral cavity and metal-ceramic fixed dentures irrigation method was performed using an "ACleon TF600" irrigator. Irrigation was carried out by a course of 0.05% aqueous solution of chlorhexidine bigluconate, it consisted of 2 sessions carried out over an interval of three weeks.

The ACleon TF600 irrigator contains seven nozzles, including a periodontal one, which has a pointed base and a thin tip made of special rubber, which allowed the liquid to get into the gingival sulcus and periodontal pocket. An orthopedic nozzle was used for mechanical cleaning of the fixed dentures. This procedure lasted, on average, 4–6 minutes.

The need for treatment of patients who used dental protheses and further control of crystallographic samples of digital processing was determined by the CPITN index.

Factors of assessment were: gingival bleeding, namely its presence or absence; signs of subgingival and supragingival calculus; gum pockets – shallow (4-5 mm) and deep (6 mm or more). Another dental plaque index was the Silness – Loe index. Statistical data were processed using a licensed package (STATISTIK 10.0**)**.

The data of the dependent variables were used to estimate the numerical indices of digital occlusiography and cone-beam tomography. In the case when the index was $p > 0.05$, the use of parametric analysis of variance was rationale, according to $p < 0.05$, we used non-parametric analysis of variance.

The correlation force (correlation coefficient – r) was interpreted as follows: r ≤ 0.25 – weak correlation; 0.25 <r <0.75 – moderate correlation; r ≥ 0.75 – strong correlation.

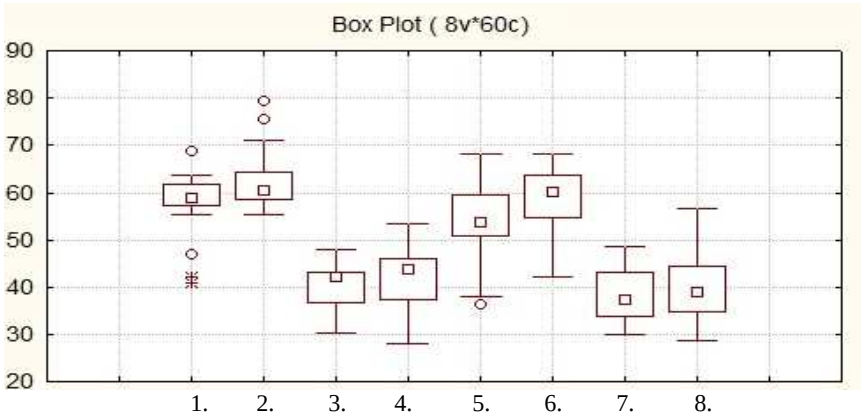


Fig. 2 Graph of fluctuations in the values of the protein fractal areas. Images of the studied groups at the different stages of treatment. 1.Group I (before the first irrigation); 2.Group II (before the first irrigation); 3.Group I (after the first irrigation); 4.Group II (after the first irrigation); 5.Group I (before the repeated irrigation); 6.Group II (before the repeated irrigation); 7.Group I (after the repeated irrigation); 8.Group II (after the repeated irrigation)

Results of the study and their discussion. Simultaneous evaluation of the values of the first and second experimental groups before and after the use of the irrigation method proves the influence of this method on the tesiographic picture, which confirms the decrease (in percent) of PFA (protein fractal area) to the total area of the figure, and this is confirmed according to this parametric analysis (fig. 2).

Table 1

Table of data of correlation multifactor analysis in the protein fractal areas of oral fluid according to digital morphometrics of a tesiographic sample Multifactor Variance Correlation Analysis

	Sigma-restricted parameterization Effective hypothesis decomposition				
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	7582,53	1	7582,531	306,1211	0,000000
A	9,57	1	9,566	0,3862	0,542550
B	11724,73	2	5862,365	236,6748	0,000000
C	294,21	3	98,071	3,9593	0,026090
Error	421.08	17	24.770		

Thus, correlation analysis shows the dependence of indices on each other. Namely: A – index of using fixed dental protheses in patients of the experimental group (< and > 4 years). Factor B as an index of the data of the applied methods of oral hygiene in patients who used metal-ceramic fixed dental prostheses. And the last factor, also known as index C, which characterizes the use of methods for determining hygiene (table 1).

This correlation of factors showed the high quality of the correlation model verification data (table 2).

Table 2

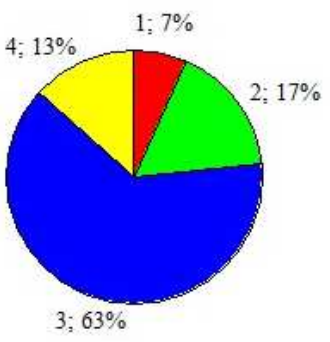
Correlation factor verification data table

Dependnt Variable	Multiple R	R2 R?	Adjusted R?	SS Model	df Model	MS Model	SS Residual	df Residual	MS Residual	F	p
Аналіз	0,982943	0,966177	0,954239	12028,51	6	2004,751	421,0850	17	24,76971	80,93561	0,000000

The obtained results of numerical values of the CPITN index in the first group before treatment gave the following results: the patients who did not need treatment were 0 people. Provided recommendations on improvement of hygienic care of the oral cavity – two persons. Five people needed professional hygiene. Topical anti-inflammatory therapy was clearly recommended for a group of 19 patients. Four patients required comprehensive treatment of the entire oral cavity (fig. 3a).

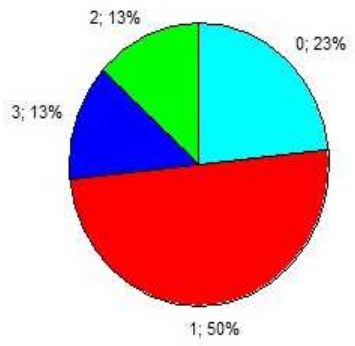
Data from the CPITN index showed the following results of the treatment: 15 patients were recommended to improve their oral hygiene. It was important to reduce the number of subjects who were shown topical anti-inflammatory therapy. There were 4 people. In other words, their number decreased from 19 to 4 people. And the number of patients who were recommended for professional hygiene decreased by 1 person. An important factor was that the number of people who were recommended complex therapy reduced to 0 (fig. 3b).

Group I before treatment



a.

Group I after treatment

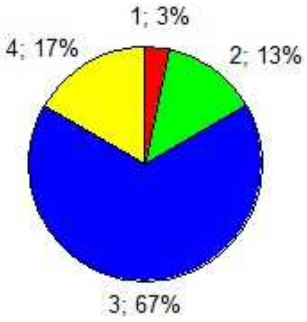


b.

Fig. 3 (a, b). Image of the CPITN index chart in the first group before treatment (a) and after treatment (b). 0 – treatment is not required; 1 – patient should improve hygiene; 2 – patient requires a course of professional hygiene; 3 – was indicated topical anti-inflammatory therapy; 4 – was indicated a comprehensive treatment

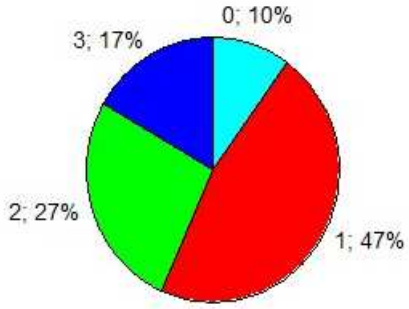
In Group II there were no patients with absolute well-being before treatment, and after it, their number in this group increased to three people. The distribution of patients by other categories in group II was as follows: recommended to improve oral hygiene – one patient; required professional hygienic intervention – 4 people; topical anti-inflammatory therapy was indicated for 20 patients; recommended comprehensive treatment of periodontal tissues – 5 patients (fig. 4a).

Group II before treatment



a.

Group II after treatment



b.

Fig. 4 (a ,b). Image of the CPITN index chart in the second group before treatment (a) and after treatment (b). 0 – treatment is not required; 1 – patient should improve hygiene; 2 – patient requires a course of professional hygiene; 3 – was indicated topical anti-inflammatory therapy; 4 – was indicated a comprehensive treatment

According to the results of the treatment: therapeutic intervention was not indicated for three people; improvement of hygienic care of the oral cavity amounted to – 14 patients; professional hygienic intervention was shown to 8 patients, and anti-inflammatory therapy, decreased from 20 to 5 people; the treatment resulted in the absence of a category of patients who were shown a comprehensive treatment (fig. 4b).

The issue of quality diagnosis of the hygienic condition of the oral cavity is paid more and more attention every year. Thus, Mira A., Simon-Soro A., Curtis M. A. Role noted in their studies the importance and prospects of modern digital methods for estimating the area of protein fractals in the digital crystallographic image of oral fluid.

It is important that the value of this index at the stage of initial control differed in the studied groups – in the first group the index of protein fractal area was 55.158%, and in the second group – 62.35%. Thus, in subjects who used fixed dental prostheses for more than 4 years, PFA was higher by 7.10%. Thus, the PFA index increases with the period of using metal-ceramic fixed dental prostheses.

Nazarchuk O. A., Faustova M. O. [5] in their works studied the effect of the mechanism of irrigation on the of oral tissues, explaining the violation of the specificity of the interaction of the organism and microbes, which causes a decrease in the signs of the oral cavity inflammation. The authors Ippolitov Ye. V., Nikolaeva Ye. N., Tsarev V. N. [3] gave an important role to the study of aggressive biofilm as inducers of innate immune signaling systems, and Orekhova L.Yu., Zhavoronkova M. D., Suborova T. N [6] emphasized the creation of modern methods for diagnosing the hygienic status of the patient. In our study, the estimation of dynamic changes in digital microscopic crystallography was clinically confirmed, namely by the methods of index CPITN estimation and Silness – Loe and confirmed by the data of Dubina V.O., Skrypnykov P.M., Khavalkina L.M. and others [2] on the influence of the irrigation method on the course of inflammatory processes in periodontal tissues.

One of the important proofs of our proposed method of irrigation and evaluation of protein fractals was multifactor correlation analysis of variance. It allowed to prove, firstly, the informativeness and clinical effectiveness of the above method of determining the hygienic condition of the oral cavity in comparison with well-known methods of index assessment, which was confirmed by estimating the high level of this correlation model (R = 0.983; R2 = 0.966).

Conclusion

The use of periodontal tissue irrigation method for fixed dental prostheses leads to a decrease in the percentage of PFA digital crystallography samples according to: from 55.158% to 37.874% in Group I, from 62.35% to 39.407% in the second experimental group. It remains important that according to digital crystallography, the second group had more patients at all stages of treatment.

Clinical confirmation was based on changes in microscopic crystallography by CPITN and Silness – Loe indices, as the treatment resulted in a decrease in the mean CPITN from 2,933 to 1,266 in Group I and from 3,066 to 1,612 in Group II. The same changes occurred when determining the Silness – Loe index, it decreased from 3,266 to 1,253 in Group I and from 3,633 to 1,421 in Group II.

After interpreting the clinical assessment according to the CPITN indices, it was determined that there were dynamic changes and as a result of the treatment we received the following data: the category of patients who showed only improvement of self-hygiene increased from 7% to 50% in the first group and from 3% to 47% in the second group, the following data showed a decrease in the number of people recommended topical anti-inflammatory therapy from 63% to 13% in the first group and from 67% to 17% in the second group.

According to the analysis of variance of multifactor indices where R = 0.983, R2 = 0.966, the validity of the values of digital crystallography of microscopic samples as an important indicator of the level of hygienic condition of the oral cavity was proved.

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Реферати

ОБГРУНТУВАННЯ ВИКОРИСТАННЯ МЕТОДІВ МІКРОСКОПІЧНОЇ КРИСТАЛОГРАФІЇ БІЛКОВИХ ФРАКТАЛІВ ТА ІРИГАЦІЇ ДЛЯ РАННЬОЇ ДІАГНОСТИКИ, ЛІКУВАННЯ ТА ПРОФІЛАКТИКИ ЗАПАЛЬНИХ ПРОЦЕСІВ ПОРОЖНИНИ РОТА

Скрипников П.М., Хавалкіна Л.М., Коробейнікова Ю.Л., Коробейніков Л.С., Тимошенко Ю.В.

В стоматології постійно пропонують нові методи профілактики та лікування захворювань викликаних агресивною біоплівкою. Якщо, ігнорувати чи недооцінювати своєчасну гігієну порожнини рота та профілактичні заходи, вплив агресивної біоплівки може бути незворотнім і викликати зміни в тканинах пародонту. Одним із головних факторів які погіршують загальний стан гігієни порожнини рота є наявність знімних та незнімних протезів у пацієнтів. Це зумовлено тим, що на поверхні штучних зубів м'який зубний наліт формується набагато швидше. На сьогоднішній день одним із дієвих і оптимальних методів, який застосовують для профілактики і лікування запальних процесів порожнини

ОБОСНОВАНИЕ ИСПОЛЬЗОВАНИЯ МЕТОДОВ МИКРОСКОПИЧЕСКОЙ КРИСТАЛЛОГРАФИИ БЕЛКОВЫХ ФРАКТАЛОВ И ИРРИГАЦИИ ДЛЯ РАННЕЙ ДИАГНОСТИКИ, ЛЕЧЕНИЯ И ПРОФИЛАКТИКИ ВОСПАЛИТЕЛЬНЫХ ПРОЦЕССОВ ПОЛОСТИ РТА

Скрипников П.Н., Хавалкина Л.М., Коробейникова Ю.Л., Коробейников Л.С., Тимошенко Ю.В.

В стоматологии постоянно предлагают новые методы профилактики и лечения заболеваний вызванных агрессивной биопленкой. Если, игнорировать или недооценивать своевременную гигиену полости рта и профилактические мероприятия, влияние агрессивной биопленки может быть необратимым и вызвать изменения в тканях пародонта. Одним из главных факторов ухудшающих общее состояние гигиены полости рта является наличие съемных и несъемных протезов у пациентов. Это обусловлено тем, что на поверхности искусственных зубов мягкий зубной налет формируется гораздо быстрее. На сегодняшний день одним из действенных и оптимальных методов, применяемых для профилактики и лечения воспалительных процессов полости рта является

рота є іригація. Нами було обстежено загалом 90 осіб. Вік пацієнтів варіював від 40-60 років. З них 40 чоловік та 50 жінок. Аналізуючи значення показника білкових фракталів, а саме площа, ми оцінили та підтвердили гігієнічний стан ротової порожнини у осіб які використували ортопедичні конструкції. Застосування методу іригації тканин пародонта для незнімних ортопедичних конструкцій призводить до зменшення відсоткової частини площі білкових фракталів цифрових зразків кристалографії. Результати підтверджені статистичними і клінічними даними.

Ключові слова: мікроскопічна кристалографія, іригація, порожнина рота, пародонт, металокерамічні незнімні ортопедичні конструкції.

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ирригация. Нами было обследовано 90 человек. Возраст пациентов варьировал от 40-60 лет. Из них 40 мужчин и 50 женщин. Анализируя значение показателя белковых фракталов, а именно площадь, мы оценили и подтвердили гигиеническое состояние полости рта у лиц которые использовали ортопедические конструкции. Применение метода ирригации тканей пародонта для несъемных ортопедических конструкций приводит к уменьшению процентной части площади белковых фракталов цифровых образцов кристаллографии. Результаты подтверждены статистическими и клиническими данными.

Ключевые слова: микроскопическая кристаллография, ирригация, полость рта, пародонт, металлокерамические несъемные ортопедические конструкции.

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RETROSPECTIVE ANALYSIS OF PRIMARY FORENSIC MEDICAL EXAMINATIONS OF THE LOWER EXTREMITIES MECHANICAL TRAUMA

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The purpose of the study was to perform a retrospective analysis of primary forensic medical examinations that established moderate severity of bodily injuries in victims with mechanical injuries of lower extremities. The study revealed the □r□d□m□n□□ □f r□d tr□ff□□ □njur□s (92%); 8% w□r□ f□lls fr□m th□ □wn h□ght. R□d tr□ff□□ □njur□s w□r□ h□r□t□r□z□d b□ □ □r□d□m□n□□ □f □□□l□ t w□rk□ng □g□ (73%); v□h□l□ h□tt□ng □ □d□str□n (86%); g□tt□ng □njur□d w□th □1□tr□um□ (82%); f□rm□t□□ □f d□□h□s□l fr□tur□s □f th□th□gh □nd sh□n (78%); th□ □r□s□n□□ □f □□m□rb□d d□s□s□s (61%). Th□□uth□rs □□ns□d□r it necessary to revise the existing and to substantiate new medical criteria for determining the severity of bodily injury, taking into account the features of connective and muscle tissues reparative regeneration.

Key words: mechanical trauma of the lower extremities, forensic medical examination, fractures of long bones, road traffic injury.

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Forensic medical examination of living individuals is the most common type of expert activity. Establishment of damages and evaluation of their severity, in order of frequency, occupies the 1st place in forensic practice and is carried out both in criminal and civil proceedings [4]. According to data obtained from Kharkiv Regional Bureau of Forensic Medical Examination (KRBFME), over the last 5 years, the number of examinations of living individuals has increased from 83.7% in 2015 to 91.2% in 2019 (compared to all examinations and examinations of victims). Numerous works were dedicated to the examination of living persons, in particular, to the injuries' severity determination [1, 3, 15].

Mechanical trauma of the lower extremities leads to damage to both soft tissues (tendons, ligaments, fascia, articular bag, sarcolemma and perimisia of muscle fibers, etc.) and supportive (bone, cartilage) types of connective tissue [11]. Each of them has a different resistance to the traumatic factor. Accordingly, the standard terms of reparative regeneration, after mechanical damage to each type of connective tissue, varies drastically – from 3-5 weeks in cases of tendon ruptures, up to 4-5 months (without callus remodeling) in cases of long tubular bones' fractures.

It should be noted that traumatic diaphyseal fractures of long tubular bones are accompanied by ruptures of intraosseous vessels, damage to fascia, ruptures and imbibition of muscle fibers. That can lead to the development of persistent contractures of adjacent (to a fracture zone) joints, regardless of the treatment method (surgical or conservative) [11]. In addition, metaepiphyseal fractures are also accompanied by ruptures of periarticular tissues (joint bag, ligaments, muscle tendons), damage to the hyaline articular cartilage, development of hemarthrosis with the formation of post-traumatic contractures of the injured joint [10]. In this regard, the terms of callus formation [6], and, especially, the periods of the rehabilitation in patients with fractures of long tubular bones [7], can significantly exceed the recovery time after isolated (especially partial) ruptures of ligaments or tendons.