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# EXPERIMENTAL MODELING OF A PURULENT WOUND

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**Annotation.** The purpose of this study is to determine the optimal method for the formation of purulent-inflammatory processes in animals in laboratory conditions in rats.

Given the many different ways of forming purulent wounds in rats, we have selected with the most accurate results. Today, there are many options for modeling purulent wound wounds, but in experimental practice, several basic methods are used. One of them is pre-existing methods ("modeling purulent wounds in rats." D.Yu. Kharitonov, A.Yu. Kovalenko. Scientific and practical journal, 2017, pp. 57-60.) after the authors compared several methods (the overturned lacquer technique, A.I.Modified technique of Sychennikov, technique of the Belarusian State Medical University, technique of subcutaneous injection of a certain suspension of microbes).

Purulent wound modeling is done in the cranial sac of the rat, since this anatomical sac is protected not only from external influences from the animal itself, but also from it, for example, additional wound contamination microflora in sheet material. In the cranial sacs of rats, purulent wound modeling with a disposable scalpel, skin and subcutaneous tissue is cut in the longitudinal direction of the body, at a depth of up to 2 parallel incision muscle fascia up to 2.0 CM in length, dropping an interval of 1.0 cm from each other. As a result, a kind of "bridge" is formed. In addition, it is more convenient for visual examination of a purulent wound in the cranial sac of a squid and is also practical in terms of further therapy.

**Keywords:** experience, rats, purulent wounds.

**Relevance.** The development of purulent-inflammatory diseases of the skin, mucous membranes and soft tissues occupies one of the leading places in the structure of infections, injuries and complications after surgical interventions inside the hospital. It depends on a number of predisposing factors: weakened immunity, vascular changes associated with diabetes mellitus, gastrointestinal diseases and other factors that are accompanied by an acute or chronic infection. From a practical point of view, it is important to develop the principles of pathogenetic treatment of purulent wounds and their complications, including diseases that aggravate the course of the infectious process in wounds. In this regard, various models of purulent wounds are being created to improve the prognosis of wound suppuration and the reliability of the infection process in them, as well as to optimize the treatment of purulent wounds. Currently, the known methods are based on the induction of a purulent process. Zatolokin V.D. and others (patent RF No. 93031608, 1995.) in the purulent

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wound model, the rat has made a 2 CM N-shaped incision in the skin in the intervertebral area and injures the wound floor with a Coxeter clamp, making the skin coasts hermetically sutured.

Basov A.A et al (patent RF No. 2455703, 2011.) in the surgical model of oxidative stress in labarotorian animals, an incision was made in the skin under local anesthesia, leaving the wound with gauze soaked in bacteria and suturing the skin over it. After 72-120 hours, a purulent wound was formed.

Zaysev A.E. and others (patent RF 2753955, 2021y) created a trophic purulent wound model for the experiment. In the intervertebral area of the experimental animal, 16 mm of skin was cut down to fascia. The wound edges were sewn with silicone disc knotted sutures with a thickness of 2mm, a diameter of 40 mm and a hole of 24 mm in the center. A silicone disc cover is closed by injecting The Wound Center with a Coxeter clamp and placing a gauze swab soaked in infection. After 48 hours, a purulent trophic ulcer was formed.

Sukhovey Y.G. and others (patent RF No. 2321898, 2006y) caused infective injury in soft tissues in rabbits. On the skin of the back, a 3.9-4.1 cm wound is installed, with an inner diameter of 2 cm. 70% acetic acid-soaked gauze is pressed into the wound for 3-5 seconds. After 3-5 days, the necrotic strupe is removed and the wound is placed in a concentration of 5x105 St. Aureus is sprinkled.

Grigoriev G.E. and others (patent RF No. 2431890, 2010y) have produced an infested wound on rat skin. To do this, the skin is cut off and a diagonal seam is placed on the corners of the wound. A scar was formed on the wound and a semi-permeable membrane was inserted, cutting it out, 0.5 ml E from under it. coli 109 and 0.5 ml Ps.aeraginosa 109 bacterial content was sent.

Alipov V.V. and others (patent RF №2601378, 2015y) in the model of causing abscess in soft tissues put 3 days of bloating using a 0.9% sodium chloride solution of 2-ml by injecting a swollen catheter under the animal's skin. In the space formed staphylotsossus aureus li microbial content 2 ml x 106 was sent. After 5 days, the abscess formed.

Galagudza M.M. and others (patent RF No. 2746435, 2020y) created an infested injury model in rats. The Autors injected 0.1-0.8% of the fecal suspension under the skin of the rat, and in 2-3 days the infested wound was caused.

Today, laboratory animals have different options for modeling purulent wounds, which differ from each other, first of all, in the location of the wound, the size of the wound defect, the nature, type and amount of pathogenic microflora. When analyzing experimental work dedicated to the study of pathogenesis, morphology, methods of treatment of purulent wounds, it was found that some authors choose the femoral-gluteal soxa as a localization of the model of the purulent process in rats, while others choose the superior soxa of the spleen.

**Research materials and methods.** Experimental studies were conducted in 130 non-breeding white male-sex bats with a weight of 170-210 G, held in the TTA vivarium. All rats lived in a room where 24-hour light fell and the hona temperature was constant 23-250C,

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in a room with the possibility of drinking water in a Free State. All operations of the experimental study and all animal manipulation were carried out using general pain relief and anesthesia, as described in the instructions of the European Community (86/609/EETS) and in the Helsinki Declaration, in accordance with the "rules for performing work using experimental animals".

In the experiment, sending a stool suspension "between two shoulders" to create a purulent wound model in rats (D.Yu.Kharitonov, A.Yu.Kovalenko) method was used.

To create the model, before manipulation, a new stool of a rat was taken into the Petri dish and mixed it with distilled water in a 1:4 ratio, passed through a 4-layer gauze and an autocal suspension was prepared. In the course of the study, after the general anesthetic of the labaratory rat with ether, the experimental animal A.I. It is laid out on Sechenov's table with a belly. A depilation of 3.0 x 3.0 cm is carried out on the cranial part of the rat. The depilated area is treated with an antiseptic, and with a disposable scalpel, the skin and subcutaneous tissues are cut in the longitudinal direction of the body, leaving an interval of 1.0 cm from each other at a depth of up to 2 parallel cross-section muscle fascia up to 2.0 CM in length. After that, the skin and subcutaneous tissue are separated over the entire length of the incision using a blunt and SHARP Method. As a result, a kind of "bridge" is formed. The fascia and muscle under the bridge are crushed using a Kocher clamp to dressing the injured area.

A sterile,4-layer napkin measuring 2.0 × 2.0 CM is inserted into the resulting autocal stool suspension. A swollen napkin with an autocal feces suspension is transferred from under the resulting "bridge". Since the napkin is swollen, it does not slip under the" bridge " and there is no need for additional fastening. After 48-72 hours, the skin of the "bridge" dries up and forms scabs. Scabies is cut at the border of healthy tissues, and there is no need for pain relief. After that, the napkin will fall off on its own. A purulent jarochate measuring 2.0 x 1.0 cm is formed under it.

**Overturned laxative technique:** the method is carried out as follows to model the wound in this way, the surface of the skin is partially cleaned of hairs,on the top of the shovel a round shape is dressing,the size of which is 1.5x1. 5 cm of hairs is not cleaned, then two convergent incisions with a length of 1.5 cm are made, Sichennikov's technique is A.I.: Completely clean the sweat hairs in the area of the rat's shovel top. After that, with a sterile disposable scalpel, a one-line cut is performed on the skin, subcutaneous fat layer, fascia and muscles with a length of 1.0 cm. Then, the walls and bottom of the wound are expanded with a Coxera clamp. The skin loskut, which is dressing, is rolled inside the wound. Asseptic boylam is put.

The BGMU method: under general anesthesia, with the help of a marker and a cardboard template, a circle with a diameter of 1.5 cm is marked on the skin of rats with pre-hair removal of the supracranial region. The marked area is incised with a scalpel to the surface fascia of the skin and subcutaneous tissue. Next, the wound edges and underlying muscles are crushed with a Kocher clip. Next, the wound bed and edges were infected with a 24-hour suspension of a mixture of microbes (Staphylococcus aureus, Pseudomonas aeruginosa), taken in equal volumes, with 10-9 microbial bodies per 1 ml (concentration was determined by the mucosal standard). The volume of the introduced microbial suspension was 1 ml.

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After that, in order to create a seal, prevent damage to the wound and infection with surrounding microorganisms, a sterile tampon was sutured to the edges of the wound with separate knotted sutures, and a locking bandage was applied.

The rats were divided into two groups, the first group was administered a culture suspension consisting of Escherichia coli and Pseudomonas aeruginosa in a ratio of 10-8 - 10-9 at a dose of 1.0 ml subcutaneously. Group 2 also included a suspension of Staphylococcus aureus and Klebsiella pneumoniae cultures in a ratio of 10-8 - 10-9.

**The results obtained and their discussion.** As a result, we achieved the following results: the technique of overturned clots did not lead to the formation of a purulent-inflammatory process in rats after 48 and 72 hours.

Sychennikov A.I.the use of ning and the technique of the Belarusian State Medical University after 48-72 hours, the appearance of hyperemia of the margins of the jarokhat was observed, and the development of a purulent-inflammatory process in all rats was not noted.

As a result of subcutaneous injection of the suspension by microorganisms Escherichia coli and Pseudomonas aeruginosa into rats in Group 1, a purulent-necrotic wound was detected in jarochat soaxa after 48 hours, Gray-smelling discharge was detected.

In rats in Group 2, a purulent process was formed after only 14 days after the introduction of gold color Staphylococcus and Klebsiella pneumonie Solutions on the shovel.

**Conclusions.** Thus, we can conclude that the most effective way to form a purulent-licking process is to introduce the suspension (Escherichia coli and Pseudomonas aeruginosa) under the skin of the cranial sac of rats.

**LITERATURE USED.**

1. Хирургическая стоматология/ Под ред. Т.Г Робустовой.-М.: Медицина, 2000,- 688 с.

2. Зайчик А.Ш., Чурилов Л.П. Общая патофизиология (Учебник для студентов медицинских вузов). -СПб, 2001.-С 273-353.

3. Груздев Н.А. Острая одонтогенная инфекция.- М.: Медицина,-2003.-С.133-148.

4. Мохова О.С. Моделирование септических ран в эксперименте / О.С. Мохова // Молодежный инновационный вестник. – 2012. – Т. 1, № 1 – С. 339-340.

5. Гинюк В.А. Методика моделирования острого местного гнойно-воспалительного процесса у лабораторных животных и проведения эксперимента по лечению полученных гнойных ран с помощью фоторегуляторной и фотодинамической терапии / В. А. Гинюк // Мед. журн. –

2009 № 1 – С. 44-46

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

6. Кулаков Л.А., Робустова Т.Г., Неробеев Л.И. Хирургическая стоматология и челюстно-лицевая хирургия. Национальное руководство М.: "ГЭОТАР-Медиа", 2010. - 928 с.

7. Гинюк ва. методика моделирования острого местного гнойно-воспалительного процесса у лабораторных животных и проведения эксперимента по лечению полученных гнойных ран с помощью фоторегуляторной и фотодинамической терапии. Мед Журн. 2009;(1):44-46. https://medmag.bsmu.by/ category27/article1266/

8. Kumar V, Khan A, Nagarajan K. Animal models for the evaluation of wound healing activity. Int Bull Drug Res. 2013;3(5):93-107. https://www.researchgate. net/publication/274010528_animal_models_for_the_ evaluation_of_wound_healing_activity.

9. Yagmur C, Guneren E, Kefeli M, Ogawa R. The effect of surgical denervation on prevention of excessive dermal scarring: a study on rabbit ear hypertrophic scar model. J Plast Reconstr Aesthet Surg. 2011 Oct;64(10):1359-65. doi: 10.1016/j.bjps.2011.04.028

10. Shanmugam VK, Tassi E, Schmidt MO, McNish S, Baker S, Attinger C, Wang H, Shara N, Wellstein A. Utility of a human–mouse xenograft model and in vivo near-infrared fluorescent imaging for studying wound healing. Int Wound J. 2015 Dec;12(6):699-705. doi: 10.1111/iwj.12205

11. Otulakowski G, Zhou L, Fung-Leung WP, Gendimenico GJ, Samuel SE, Lau CY. Use of a human skin-grafted nude mouse model for the evaluation of topical retinoic acid treatment. J Invest Dermatol. 1994 Apr;102(4):515-18. doi: 10.1111/1523-1747.ep12373180.

12. Dai T, Kharkwal GB, Tanaka M, Huang YY, Bil de Arce VJ, Hamblin MR. Animal models of external traumatic wound infections. Virulence. 2011 JulAug;2(4):296-15. doi: 10.4161/viru.2.4.16840

13. Yusufjanovich, E. U., Rafiqovich, Z. A., & Irsalievich, E. K. (2023). Assessment of the Process of Epithelialization After Complex Treatment of Diabetic Foot Syndrome. *Texas Journal of Medical Science*, *16*, 19-23.

14. Yusufjanovich, E. U., & Rafiqovich, Z. A. (2023). Treatment of purulent-necrotic lesions of the lower extremities with modern drugs. *Conferencea*, 88-94.

15. Зохиров, А. Р., Абдусаломов, Б. А., & Моминов, А. Т. (2022). Совершенствование комплексного лечения с учетом патофизиологических изменений гнойно-некротических поражений нижних конечностей при сахарном диабете.

16. Ergashev, U. Y., Zokhirov, A. R., & Ernazarov, K. I. (2022). THE STUDY OF PATHOMORPHOLOGICAL DIAGNOSIS OF VITAL ORGANS AFTER MODERN TREATMENT OF DIABETIC FOOT SYNDROME.

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

17. Эргашев, У. Ю., & Зохиров, А. Р. (2023). Оценка эффективности малоинвазивных операций при механической желтухе и применение алгоритма. *European Journal of Interdisciplinary Research and Development*, *12*, 6-16.

18. Эргашев, У. Ю., & Зохиров, А. Р. (2023). ИЗУЧЕНИЕ ПАТОМОРФОЛОГИИ ПЕЧЕНИ ПРИ ЭКСПЕРИМЕНТАЛЬНОМ СИНДРОМЕ ДИАБЕТИЧЕСКОЙ СТОПЫ. *European Journal of Interdisciplinary Research and Development*, *12*, 27-31.

19. Yusufjanovich, E. U., Irisbaevich, M. G., Rafiqovich, Z. A., & Irsaliyevich, E. K. (2023). Evaluation of Effectiveness of Splenectomy in Chronic Leukemias. *World Bulletin of Public Health*, *19*, 79-83.

20. Yusufjanovich, E. U., Rafiqovich, Z. A., & Tohirovich, G. B. (2023). PRINCIPLES OF STUDYING LIVER MORPHOLOGY IN EXPERIMENTAL DIABETIC FOOT SYNDROME. *World Bulletin of Public Health*, *19*, 63-65.

21. Ergashev, U. Y., Minavarkhujayev, R. R., Gafurov, B. T., Malikov, N. M., Ortiqboyev, F. D., & Abdusalomov, B. A. (2022). Efficiency of Percutaneous Minimally Invasive Technologies in the Treatment of Patients with Obstructive Jaundice.

22. Моминов, А. Т., Маликов, Н. М., Якубов, Д. Р., & Абдусаломов, Б. А. (2022). Проблемы обезболивания в амбулаторной хирургии. *European Journal of Interdisciplinary Research and Development*, *10*, 81-89.

23. Ergashev, U. Y., Abdusalomov, B. A., Minavarkhojayev, R. R., Ortiqboyev, F. D., & Malikov, N. M. (2023). Evaluation of the pathomorphology of regeneration in diabetic foot syndrome and determination of its dependence on biochemical processes. *World Bulletin of Public Health*, *19*, 66-78.

24. Abdusalomov, B. A., & Rafiqovich, Z. A. (2023). THE MECHANISM OF ACTION OF THE GEL FORM OF COLLAGEN IN DIABETIC WOUNDS. *International Journal of Medical Sciences And Clinical Research*, *3*(03), 96-103.

25. Ergashev, U. Y., Malikov, N. M., Yakubov, D. R., Abdusalomov, B. A., & Gafurov, B. T. (2023). Use of Collagen and Fibroblasts in Modern Medicine. *Eurasian Research Bulletin*, *17*, 78-84.

26 Ergashev, U. Y., Mominov, A. T., Malikov, N. M., Yakubov, D. R., & Abdusalomov, B. A. (2023). MODERN APPROACH TO COMPLEX TREATMENT OF DIABETIC FOOT ULCERS. *LITERATURE REVIEW*.

27. Ergashev, U. Y., Abdusalomov, B. A., & Zohirov, A. R. (2023, May). Eksperimental diabetik tavon sindromida hayotiy muhim a'zolarning morfologik o'zgarishlarini nazorat qilish. /Material of International scientific and practical conference" An integrated approach to the treatment of complications of diabetes".

ISSN: 2692-5206
AMERICAN ACADEMIC PUBLISHER
INTERNATIONAL JOURNAL OF MEDICAL SCIENCES

28. Abdusalomov, B. A. (2023). USE OF MODERN METHODS IN THE TREATMENT OF CHRONIC WOUNDS. *Journal of Academic Research and Trends in Educational Sciences*, *2*(3), 213-220.

29. Abdusalomov, B. A. (2023). The Role of Collagen in The Mechanisms of Chronic Wound Healing for Diabetic Foot Syndrome. *Texas Journal of Medical Science*, *26*, 86-94.

30. Ergashev, U. Y., Mominov, A. T., Malikov, N. M., Yakubov, D. R., & Abdusalomov, B. A. (2023). MODERN APPROACH TO COMPLEX TREATMENT OF DIABETIC FOOT ULCERS.(LITERATURE REVIEW).