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Modern Approaches To Comprehensive Treatment Of Erythematous-Bullous Erysipelas In Patients: Achievements And Shortcomings (Literature Review)

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Abstract

As a result of clinical and epidemiological observations by many authors over the past decade, changes in the clinical course of sarcasm have been noted. In particular, a significant increase in the number of purulent-necrotic forms has been revealed, the number of disease relapses has not decreased, their frequent development and high mortality remain. Analysis of available scientific data shows that currently, there is no clearly developed program for the use of magnetic laser therapy in the complex treatment of complicated forms of sarcasm. Information on the morphological features of ulcerative processes and changes in local microcirculation under the influence of this therapy is also insufficient. The significance of the aforementioned problem in practical medicine and the presence of many unexplored issues served as the basis for conducting this scientific research.

Keywords: Measles inflammation, intravenous laser blood irradiation, photodynamic therapy, magneto-laser therapy, lymphotropic therapy, electrochemically activated solutions.

Introduction

Currently, a characteristic feature of sarcastic inflammation is a high incidence rate without a tendency to decrease (1.4-2.2 per 1000 adult population), independent of regional and social characteristics, living standards, most commonly occurring in women, predominantly in people of working age, and characterized by a high tendency to relapse [1,2,3].

Malignant inflammation occurs when a number of predisposing factors contribute to the fixation of the microorganism on the endothelium of the lymphatic vessels, causing secondary lymphadenitis, which leads to the destruction of the valve apparatus of the lymphatic vessels and, as a consequence, to retrograde lymph flow. The outcome of lymphangitis is the obliteration of the lymphatic bed, which leads to worsening of swelling and contributes to the creation of favorable conditions for disease recurrence, the formation of persistent limb deformation, and the disability of patients [3,4,5].

Comprehensive, combined treatment of patients with rhinitis is currently the standard. At the same time, choosing the most effective treatment tactics remains a contentious issue [4,5].

Conservative therapy and disease recurrence prevention involve systemic antibacterial therapy, hormone therapy with glucocorticoids, prolonged infusion of antiplatelet agents, vitamins, anticoagulants, and immunocorrective therapy. However, all proposed non-invasive or minimally invasive methods do not allow for the elimination of the resulting lymphatic vessel obstruction. At the same time, conditions remain for the progression of the disease course, with a high probability of recurrence [6].

Currently, scientists suggest using extracorporeal methods of cancer treatment: blood enrichment with antibiotics using electrophoresis, plasmapheresis, but these methods are used in combination with others, and it is difficult to judge their benefits [6,7].

Surgical treatment includes repeated necrectomy, dissection, and sanitation of purulent stumps in complicated forms. Endolymphatic administration of antibiotics is also used, applied to a limited circle of patients without impairments in peripheral lympho- and blood circulation. For this, it is necessary to study the permeability of the main lymphatic vessels using contrasting (G.A. Izmailov, 2015; Kolesov A.I., 2020; V.V. Pavlov, 2015). At the same time, the authors do not provide a demonstrable basis for the effectiveness of applying this method, the advantages of which are considered only from an empirical point of view [8,9].

As a preventative measure for the recurrence of sarcasm, it is proposed to apply a lymphovenous shunt, which, as practice has shown, often complicates with thrombosis in the long-term postoperative period. It should be noted that this method is not used in the acute phase of the disease (V.M. Narenkov, A.M. Kosenkov, 2017).

At the present stage, the treatment of sarcasm by local exposure to the area of the pathological process: laser therapy, cryotherapy, argon and air-plasma flows is considered very progressive (R.Kh. Abdulov, 2016; A.M. Shulutko, 2016; A.G. Khasanov, 2019).

In recent decades, clinical and epidemiological observations by many authors have noted changes in the clinical course of sarcasm towards a significant increase in the number of hemorrhagic forms, a decrease in the number of relapses, more frequent development of purulent-necrotic complications of the disease, and a high level of mortality persisting (Nichols R L, Florman S T, 2021; Caetano M, Amorin I, 2025). From 10% to 16% of all patients who sought a surgeon at the polyclinic account for rickets, and more than 6% of all these patients are hospitalized in specialized surgical departments. At the same time, among all patients with purulent-septic pathology admitted to specialized hospitals, more than 20% are those with rickets [9,10].

To solve this problem, a significant arsenal of tools is proposed, in particular, high-energy and low-energy lasers, plasma flows, photodynamic therapy [10,11].

In a number of recent studies, the effectiveness of intravenous blood laser radiation (BLA) and NILT in the treatment of uncomplicated (erythematous, bullous, hemorrhagic) forms of sarcasm has been proven [1,9,10]. There are isolated studies in the literature on the possibility of using magnetolaser therapy in the treatment of uncomplicated forms of sarcasm (Yerovichenkov A.A., 2020, Moskvin S.V., Buylin V.A., 2016). A.K. Polonsky et al. (2020) experimentally showed that the combination of PMP (25-30 mT) and LT (4.5 -5.0 mW/cm2) is more effective than laser therapy and magnetotherapy used separately. The combination of these two methods is not an ordinary sum of effects, but has a synergistic resonance character, which has a more pronounced effect on the body (Kozlov V.I., Builin V.A.,

2016). At the same time, there are no reports in the literature on the use of magnetolaser therapy in the complex treatment of patients with complicated (phlegmonous, phlegmonous-necrotic) forms of sarcasm [11,12].

This determines the relevance of this research.

Thus, analyzing the current state of the problem, it should be acknowledged that currently, there is no consistent program for applying magnetolazer therapy in the treatment of patients with complicated forms of sarcasm, and there are no reports on the morphological characteristics of the wound process during magnetolazer therapy of complicated forms of sarcasm and its impact on regional microcirculation [12,13].

At the present stage, changes in the typical, classical clinical symptoms and course of surgical infection are observed (Zharov M.A. et al., 2017; Grasland A., Groza M., 2020). This trend is also observed in complicated forms of sarcasm, which leads to an increase in treatment time. (Yerovichenkov, A.A., 2014; Bernard R., Christmann D., 2015). Complicated forms of sarcasm with extensive lesions lead to persistent disability in 17-28% of patients, leading to prolonged stay in the hospital (1 month or more) in 35-47% of patients (Ratnikova L.I., 2017; Glazeeva S.A., 2018; Caetano M., 2015). The mortality rate in the necrotic form of sarcasm ranges from 6 to 36% (Pshenichnaya N.Yu., 2015; Dupuy A., 2021). According to a number of authors, the number of cases of sarcasm relapses is also increasing and amounts to about 50% (Yerovichenkov A.A., 2014; Kosenkov A.N., 2025).

The notion that R-hemolytic streptococcus is considered the sole causative agent of sarcasm is also established, but currently, the replacement of streptococcal monoculture from the inflammation site with microbial association is observed, leading to the development of purulent complications, generalization of surgical infection, or its chronic course [12,13,14].

Today, there is a whole arsenal of drug therapy: antibiotics, anticoagulants, vitamins, enzymes, and many methods of surgical treatment of complicated forms of sarcasm: necrectomy, the use of extracorporeal methods, indirect lymphotropic therapy, etc. Despite the availability of many treatment methods, the incidence of sarcasm, especially its complicated forms, remains high, and the number of relapses continues to increase, which necessitates further search for new treatment methods for this nosology [15,16].

Rhinitis is an acute infectious-allergic disease characterized by serous or serous-hemorrhagic lesions of the skin, subcutaneous tissue, and fever with general toxic manifestations. For many years, rickets was considered a serious epidemic disease that proceeds with dangerous complications and high mortality [2,3,14]. Irrational antibiotic therapy, a change in the body's immune status, led to a significant change in the clinical course of sarcasm [3,15].

Until now, the issues of diagnosis and treatment have not been fully resolved and are a subject of discussion. A characteristic feature of the infectious disease - rhinitis - is that its treatment is at the intersection of two specialties: infectious diseases and surgery (Yerovichenkov A.A., 2022). According to infectious disease specialists, rickets ranks 4th in terms of prevalence among infectious pathologies, surpassing only influenza, dysentery, and viral hepatitis (Raskovalov M.G., 2023; Khlestakov A.A., 2024; Cherkasov V.L., 2023). Rhinitis also occupies a significant place in the structure of purulent-surgical diseases, ranging from 7 to 14% and tending to increase [4,16,17].

Unfavorable moments in complicated forms of sarcasm are not only pronounced and significantly diffuse purulent-necrotic changes in the skin and subcutaneous adipose tissue, but also pronounced intoxication of the body. The combination of these factors often leads to a severe course of the disease and disability of patients [14,15,16].

In recent publications devoted to the treatment of complicated forms of sarcasm, discussions are mainly focused on surgical treatment (Shirshov O.N., Tolstoye O.A.,2019; Kanorskiy I.D., Lipatov K.V., 2014).

At the same time, insufficient attention is paid to predicting the development of purulent-necrotic complications and preventing recurrence. Sarcoma is a widespread infectious-inflammatory skin disease with predominantly lower limb damage (affected by 12 to 20 cases per 10,000 population) and frequent recurrence - from 20 to 45%. At the same time, a significant number of patients are the most able-bodied individuals aged 20 to 60 [9,18,19].

Traditional methods of treating sarcoma do not lead to a decrease in the frequency of complications and adverse outcomes, do not prevent the development of disease relapses, which makes the problem of treating

sarcoma inflammation relevant. The main methods of treating sarcoma are reduced to the use of various antibiotic regimens and their combination with physiotherapeutic procedures (Lutsevich E.V., Prazdnikov E.N. et al., 2021; Ananyev E.L., 2021; Olzeev I.S., 2014; Yarema I.V. et al., 2019; Vyrenkov E.Yu. et al., 2019). It is well known that the important role of the lymphatic system in surgical diseases of various origins lies in its involvement in all pathological processes in the body (Vyrenkov E.Yu. et al., 2017, 2018). It has been shown that when a bacterial infection enters the body, it primarily localizes in the lymph nodes and subsequently spreads to other organs and tissues [10,11,18].

It has been proven that the lymphatic system in cancer inflammation constantly participates in the development of the pathological process, due to the fact that the most active reproduction of microbes occurs in the lymphatic vessels and regional lymph nodes, and their spread occurs through the lymphatic pathways [11,18,19].

To increase the effectiveness of antibacterial therapy in the treatment of a number of surgical diseases, the method of endolymphatic administration of antibiotics and other medications is widely used [8,18,19].

During the late 90s and early 2000s, data emerged on the use of nitrogen monoxide in the treatment of various inflammatory diseases. According to fundamental research (Carter E.A., et. al. 2018; Schafer M.R., et. al. 2017), nitrogen monoxide has a pronounced bactericidal effect, promotes reparative regeneration processes, positively affects immunity, and improves microcirculation. Considering the important role of the lymphatic system in maintaining homeostasis, the participation of lymph nodes in the implementation of barrier and immunological functions, it is necessary to study some aspects of the body's immunological reactivity during the inflammatory process in the skin and subcutaneous tissue when exposing the inflammation site to electrochemically activated solutions (ECA) [20,21].

It is known that the active precursors of ECHA solutions are toxicologically and environmentally safe, do not accumulate in the external environment due to their metastability, do not create a background of residual toxicity, and have a pronounced bactericidal effect [15,20].

Treatment of patients with destructive forms of rhinitis of various localizations continues to be one of the most complex problems of surgery (Gostishchev V.K. et al., 2025; Lipatov K.V. et al., 2025; Cherkasov V.L., 2017; Celestin R. 2017). Interest in this topic is due to a number of factors. First of all, it should be noted that sarcoma is characterized by a stable high incidence rate, which does not have a tendency to decrease (Klimchuk S.A. et al., 2024; Troitsky V.I. et al., 2024) According to sample data, the average incidence of rickets in Russia is 12-20: 10,000 (Yerovichenkov A.A., 2023), and in European countries - 4.3:10,000 adult population (Pokrovsky V.I., 2019).

In recent decades, clinical and epidemiological observations by many authors have noted changes in the clinical symptoms and course of rhinitis. There is an increase in the number of patients with destructive necrotic forms of sarcoma (Korpysheva V.G. et al., 2021). In the structure of surgical diseases, the proportion of sarcoma is from 7 to 11% (Gostishchev V.K., 2025; Cherkasov V.L., 2017). Complicated forms of sarcoma inflammation cause patients to remain in the hospital for extended periods (Troitsky V.I. et al., 2025; Ratnikova L.I. et al., 2021; Krasagakis K., 2021), and extensive areas of local damage lead to disability. The proportion of recurrent cases (from 16 to 50% of all cases) (Bubnova H.A. et al., 2025), which ensure the formation of persistent lymphostasis and acquired elephantiasis (Efremova O.A. et al., 2020; Cherkasov V.L., 2017; Pitche P.V., 2015).

The accumulation of knowledge about the etiological and pathogenetic aspects of rosy voyepalepia necessitates a review of the main approaches to treating the disease. Currently, there is no doubt that the leading factor in the pathogenesis of rhinal rhinitis is the imbalance in the system of cellular and phagocytic links of immunity [21,22].

Patients with surgical soft tissue infections (STMI) constitute 30-35% of all surgical patients (S.A. Shlyapnikov, 2023; Kulakova N.V., 2024; A.Tillou et al., 2024). In modern Russia, the high incidence of STI is largely due to chronic immunodeficiency, ongoing aging of the population, unsatisfactory ecological conditions in many regions of the country, as well as the increase in the number of various types of interventions and injuries (S.G. Izmailov et al. 2015; Yeryukhin I.A. et al., 2016; B.S. Briskin et al., 2017). A similar picture is observed in other regions of the Near East, where up to

5 million patients with purulent-necrotic soft tissue lesions are registered annually (N.N. Safarov, 2015; Jgenti D.V. et al., 2015; L.V. Pisarsno, 2024). In the USA and Western European countries, up to 10% of all hospitalization cases are attributed to TMI, and the annual economic damage from them is estimated at $9-10 billion (D.Zoutman et al., 2024; J.Reilly et al., 2021; D. Malone et al., 2022).

A long period of extensive purulent wound against the background of traditional treatment not only prolongs the patient's suffering but also entails significant material costs from both the state and the patient (Nazarenko G.I. et al., 2022; Yeryukhin I.A., 2023; R.Nikols, 2021). The situation is complicated by the high antibiotic resistance of wound infection pathogens, the steady increase in the number of pathogenic microorganism's resistant not only to antibiotics but also to certain antiseptics [21,22,23].

It is known that the most potent local treatment of SMI loses its effectiveness if it is not combined with technologies that promote purulent wound cleansing and create favorable conditions for regenerative processes (H.Degreef, 2024). The achievements of scientific and technological progress allowed, at the end of the last century, to approach the problem of optimizing treatment measures from a new perspective, especially since the main tool in this category of patients is still the surgical treatment of the purulent-necrotic focus (PNCF). Today, there is a wide range of physical and physicochemical methods of local influence, used in combination with traditional ("mechanical") surgery. Among them, plasma technology holds a special place. Numerous experimental and clinical studies devoted to the use of plasma streams (SP) in surgical practice indicate their following advantages: practically bloodless dissection and excision of devitalized tissues; hemostasis and sterilization of the wound surface; creation of optimal conditions for subsequent regeneration of the tissue substrate, especially due to the biostimulating effect of exogenous nitrogen (II) oxide molecules of the air-plasma stream [24].

Despite the apparent study, plasma surgery is still on its path of development. There is still no consistent unified program for complex treatment of SMI using this energy. Some aspects of using various PPs in severe forms of SMI, such as extensive purulent-necrotic lesions of soft tissues, complicated forms of sarcasm, etc., remain poorly studied and have not received proper justification, therefore, the possibilities of improving this technology are not fully exhausted; this especially applies to the issues of increasing the effectiveness of plasma treatment methods at various stages of the wound process. Another pressing issue in general surgical practice is acute varicothrombophlebitis (AVTP), which develops in approximately 30% of patients with varicose disease of the lower extremities (G. Belcaro et al., 2024).

Treatment of this group is a complex social task, given the high prevalence of background nosology among the adult population and the risk of thromboembolic complications (U.Krause et al., 2023; J. Beatty et al., 2022).

As is known, with pronounced paravazal inflammation, radical interventions based on classical flebrectomy are traumatic, increase the risk of wound complications, and are not always acceptable from an aesthetic perspective. On the other hand, routine conservative therapy is also unable to quickly suppress the local thrombo-inflammatory process, delaying its resolution for a long time (G. Agus et al., 2023). These points dictate the need to develop more advanced treatment methods in which effective methods of traditional surgery would be rationally combined with fundamentally different energies, including plasma treatment and endovascular laser coagulation of affected subcutaneous veins [14,20,25].

Sores inflammation occurs with a frequency of 1.4 - 2.2 per 1000 adult population and ranks fourth among infectious pathologies in terms of prevalence, after influenza, dysentery, viral hepatitis [13,14,25].

The incidence of rickets has remained stable for the past thirty years, despite the widespread use of bicillin prophylaxis regimens, characterized by a tendency to frequent and persistent relapses in 16-50% of treated patients, and with the development of severe complications such as lymphedema leading to disability [3,5,15].

In recent years, there has been an increase in the number of complicated forms of the disease. Mortality in sarcoma also has an unfavorable dynamic - averaging 5.6% in St. Petersburg (Rybakova M.G., Vishnyakov N.I., 2018). It should be noted that this unfavorable epidemiological situation is observed against the backdrop of persistent sensitivity of the A group beta-hemolytic streptococcus, which is currently recognized

as the main etiological factor, to practically all classes of antibacterial drugs, including natural penicillins. The main etiopathogenetic direction in the treatment of sarcoma is antibacterial therapy, which is based on the proven etiological role of hemolytic streptococcus in numerous studies. The standard commonly accepted treatment regimen for sarcasm includes antibacterial, desensitizing, detoxifying, and local therapy [6,7,17].

Currently, there are many schemes for antibacterial therapy of sarcoma with proven clinical effectiveness, consisting in the rapid elimination of acute general and local inflammatory symptoms. The widespread use in clinical practice of the standard scheme for treating and preventing sarcoma inflammation, which mainly involved the use of antibiotics, according to literature data, did not contribute to a decrease in the frequency of relapses [8,18].

The absence of a significant prophylactic effect of various groups of antibiotics, to which the beta-hemolytic streptococcus of group "A" is 100% sensitive for the development of relapses of sarcoma, necessitated further research aimed at studying the etiology and pathogenesis of sarcoma and risk factors for its development. Many researchers dealing with the problem of sarcophageal inflammation note that hemolytic streptococcus causes sarcophageal inflammation only under certain conditions - risk factors [11,16,21].

However, at present, there is no consensus on which conditions should be considered as risk factors for the development of sarcoma and which of these factors are leading. There are a number of studies that highlight such risk factors for sarcophageal inflammation as diabetes mellitus, lympho- and blood circulation disorders, trophic factors, sedentary work, certain harmful habits: alcoholism, smoking, drug addiction; disruption of skin or mucous membranes integrity, myotic foot damage [23,25].

Regarding the role of foot mycoses, there are contradictory views: some authors even do not include foot fungal pathology in the list of risk factors for the development of sarcoma (Crickx V., Chevron F., Sigal Nahum M. et al.2021), while others write about the significant role of foot mycoses as a significant risk factor for the development of sarcoma (Dupuy A., Benchikhi N., Roujeau J.C. 2019; Dupuy A. 2021; Roujeau JC, Sigurgeirsson W, Korting HC, 2021).

The ambiguity of opinions regarding the role of mycotic infection in the development of sarcoma and its recurrence, and at the same time, the high frequency of foot mycoses in sarcoma, especially in its recurrence, noted by many authors, make it relevant to conduct research on the study of the relationship between foot mycoses and sarcoma (Dupuy A. 2021; Roujeau JC, Sigurgeirsson W, Korting HC, 2021).

The concept of recurrent sarcophageal inflammation as a chronic streptococcal infection with prolonged persistence of L-forms of hemolytic streptococcus in the body, the development of immunopathological reactions proceeding through infectious-allergic (hypersensitivity reaction of a delayed type) and immunocomplex mechanisms, which has formed in recent years, explains far from all aspects of disease pathogenesis development (the use of standard schemes for the prevention of sarcophage recurrence, including the use of prolonged penicillins and immunomodulators, does not lead to a noticeable decrease in the frequency of relapses) [20,23,25].

Conclusion

Modern epidemiological data on the incidence and high prevalence of sarcarditis, which have remained stable over the past thirty years, the tendency to develop frequent and persistent relapses in 16-50% of treated patients, and the relatively high mortality rate indicate that the problem remains relevant for medicine. Thus, the problems of treating and preventing the recurrence of sarcoma are far from their final solution, and scientific research aimed at studying the etiopathogenetic aspects of this disease, as well as increasing the effectiveness of complex treatment and prevention of sarcoma and its recurrence, is relevant.

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