



SOFT TISSUE SURGICAL INFECTIONS: MODERN APPROACH TO THE PROBLEM

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Annotation

The article discusses the state of the purulent surgical service in Uzbekistan based on the results of patients treated at the Republican Center for Purulent Surgery and Surgical Complications of Diabetes Mellitus in 2022. The analysis was carried out among 2001 patients with purulent-necrotic diseases of soft tissues. Based on the analysis of the results of treatment, the main nosologies were identified and the causes of unsatisfactory results of treatment with this pathology were considered.

Keywords: surgical infection of soft tissues, purulent surgery, necrotic infection, late diagnosis, levels of soft tissue damage.

INTRODUCTION

"Suppurative" surgery appeared with the emergence of human civilization, and purulent-necrotic diseases of soft tissues remain a complex problem of surgery, occupying one of the main places among surgical pathologies [1,2,].

In the presence of underlying diseases, many acute wounds become chronic wounds, which are associated with certain diseases, such as diabetes, and follow an orderly set of steps and predictable timelines that characterize the normal wound healing process. Chronic wounds often remain in the inflammatory phase for a long time, and their duration is related to factors such as bacterial, necrotic tissue, and moisture balance of the wound process [3,4,5].

The constant change of the microbial landscape, the emergence of highly virulent and antibiotic-resistant strains, the decrease in the general immunological reactivity of the population leads to a change in the structure and nature of purulent lesions of soft tissues, and as a result, purulent soft tissue diseases and infectious complications. There is a steady increase in the number of patients [6,7,8, 9].

According to local and foreign authors, the number of patients with purulent diseases of soft tissues today is 35-45% of the total number of surgical patients, and the mortality rate reaches 25-50% [10, 15].

Purulent disease of soft tissues is the result of the penetration and reproduction of pathogenic pyogenic microbes in soft tissues, which subsequently forms a purulent focus, which, on the one hand, requires overcoming the protective forces of the macroorganism, on the other hand. the existence of a certain sensitivity of the organism to the pathogenic agent, and recently the necrotic forms of this disease prevail [11, 12, 13, 14].

To summarize the above, it should be noted that the problem of treatment of purulent-necrotic diseases of soft tissues, despite the wide range of treatment methods, remains a very relevant one, which is actively discussed in domestic and foreign literature. In this regard, based on the results of patients treated in 2022, we set ourselves the goal of studying the state of soft tissue infection service in the Republic of Uzbekistan.

Research methods

This work was developed on the basis of the analysis of the results of the treatment of patients for 2022 at the Republican Center for Purulent Surgery and Surgical Complications of Diabetes Mellitus at the Multidisciplinary Clinic of the Tashkent Medical Academy, where 2515 patients with surgical infections of various sites were treated. during this period.

Patients were divided into two groups. The first group consisted of patients who came directly to our clinic for first aid, and the second group consisted of patients who received various medical measures at their location. According to this gradation, 392 of 2515 patients were primary (15.6%) and 2123 (84.4%) were secondary (Figure 1).

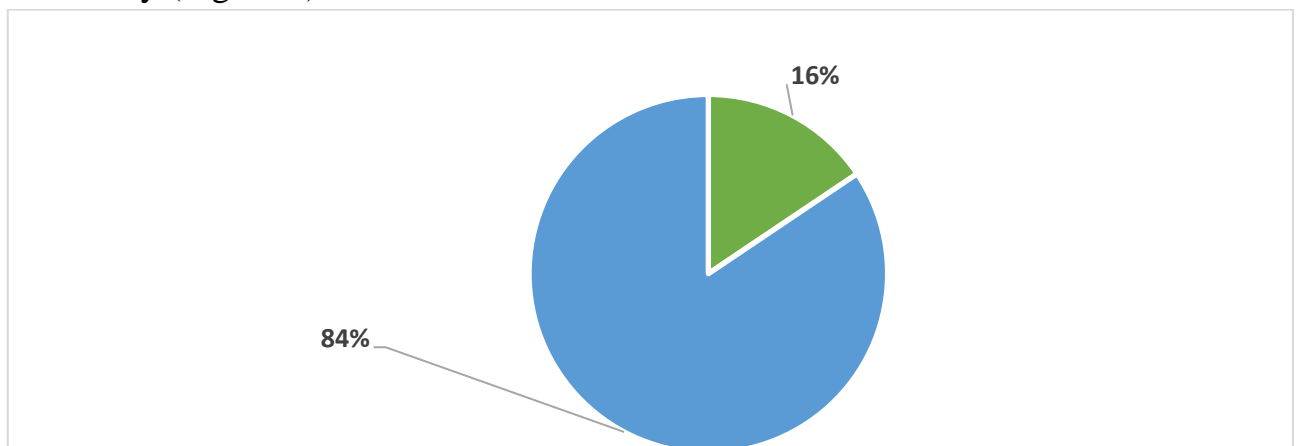


Figure 1. Characteristics of treated patients.

We analyzed secondary patients with soft tissue surgical infections. Surgical soft tissue infection was detected in 509 (23.9%) patients, the remaining 1614 (66.1%) were patients with surgical soft tissue infections of various anatomical structures.



In addition, in 268 patients (52.6%) this pathology developed against the background of diabetes.

The most common are patients with phlegmon in various places, which were found in 184 patients (36.1%), followed by patients with purulent-necrotic ulcers - 96 (18.9%). Soft tissue abscess with carbuncle was found in 82 (16.1%) and 61 (12.0%) patients. Erythema was less common, diagnosed in 26 patients (5.1%) and 28 (5.5%) in anaerobic phlegmon. In 14 patients - 2.7%, soft tissue infiltrate was detected. I would like to note that against the background of conservative treatment, patients managed to achieve regression of the inflammatory process (Table 1).

Table1 Nosological characteristics of patients

Nosology	n	%
Abscess	82	16.1
Phlegmon	184	36.1
Saramas	26	5.1
Carbuncle	61	12.0
Trophic wounds	11	2.2
Purulent-necrotic wounds	96	18.9
Anaerobic phlegmon	28	5.5
Soft tissue infiltration	14	2.7
Bed sore	7	1.4
Total	509	100

When analyzing the distribution of these patients across the Republic, it was found that the main contingent is residents of Tashkent and Tashkent cities. region, applications were received from all regions of the republic (Table 2).

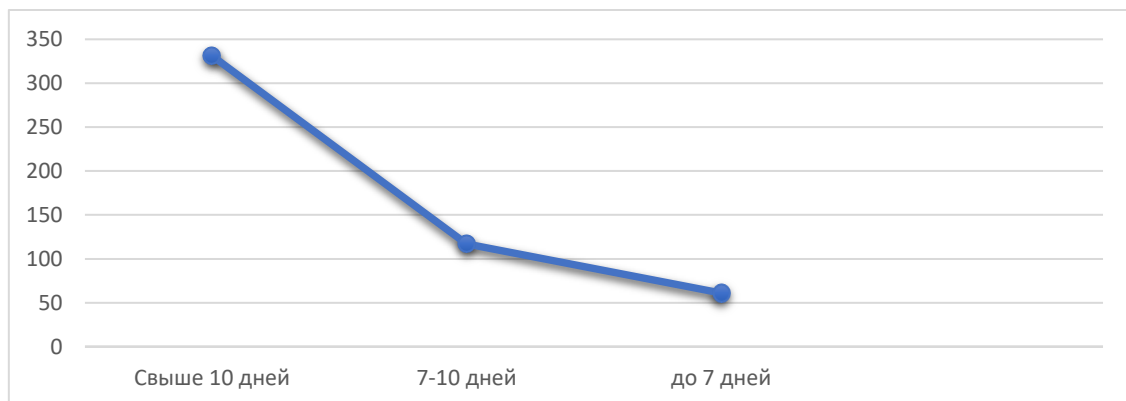
Table 2.

Regions	Total	
	n	%
Toshkent	148	29.1
Toshkent	182	35.8
Andijon	7	1.4
Namangan	13	2.5
Navoi	3	0,6
Khorazm	12	2.3
Sirdaryo	18	3.5
Jizzakh	10	2.0

Bukhoro	6	1.2
Fergana	o'n bir	2.2
Kashkadaryo	35	6.8
Surkhondaryo	37	7.3
Samarkand	19	3.7
Korakalpogistan	8	1.6
Total	509	100

Before being admitted to the center, the majority of patients underwent surgery, 49% of patients underwent surgery twice, 31% once, 3 times, 11% of patients, and 9% several times were observed.

Before admission, patients were treated for an average of 7 to 10 days in 65% of cases (331), a quarter of patients (117 - 23%) were treated for more than 10 days at the place of initial referral and patients were admitted. less often (61 - 12%) treated up to 7 days (Fig. 2).).



2. Fig. The presence of patients before admission to the TMA clinic.

A study analyzing the reasons for the retention of a high percentage of secondary patients showed that the problem of adequate antibacterial therapy was identified in all treated patients first (Table 3). Disadvantages include:

- underestimation of the dose of the used drug;
- reduce the frequency of reception;
- abuse of oral administration;
- use of one antibiotic regardless of sensitivity;
- use of several antibiotics without taking into account the principle of prophylactic antibiotic therapy;
- errors in the interpretation of prophylactic antibiotic therapy;
- underestimation of the role of pathogenic fungi in the development of generalization of the process;



Table No3. Reasons for unsatisfactory treatment

Yo'q.	Reasons	n	%
1	Delayed diagnosis	346	68
2	Inadequate surgical intervention	356	70
3	Preservation of a deep pathological process in tissues	285	56
4	Mistakes in antibacterial therapy	519	88
5	Disadvantages of local government	392	77

I would like to note that in 14 (2.7%) patients admitted to the hospital with the diagnosis of soft tissue infiltration, the process was only performed by the Ministry of Health of the Republic of Uzbekistan dated June 29, 2011 No. 192 developed and approved antibacterial and symptomatic therapy stopped.

The next reason for unsatisfactory results of treatment is late diagnosis, patients were not treated in specialized institutions. This criterion was determined in 346 patients (68%).

Adequate surgical intervention was noted in 356 patients (70%) in whom small incisions were made to drain the abscess without necrectomy. reported in 56% of patients (285).

A targeted study of this problem showed that the main reason for unsatisfactory treatment results is the lack of a unified approach to the diagnosis, treatment and surgical intervention of patients with this pathology when necrotic changes prevail in the pathological center.

We use the classification of D. H. Ahrenholz (1991), which has long taken its place in the practice of purulent surgeons. In connection with this classification, the degree of soft tissue damage is distinguished, not the type and form of damage. According to this classification, level IV criteria are distinguished:

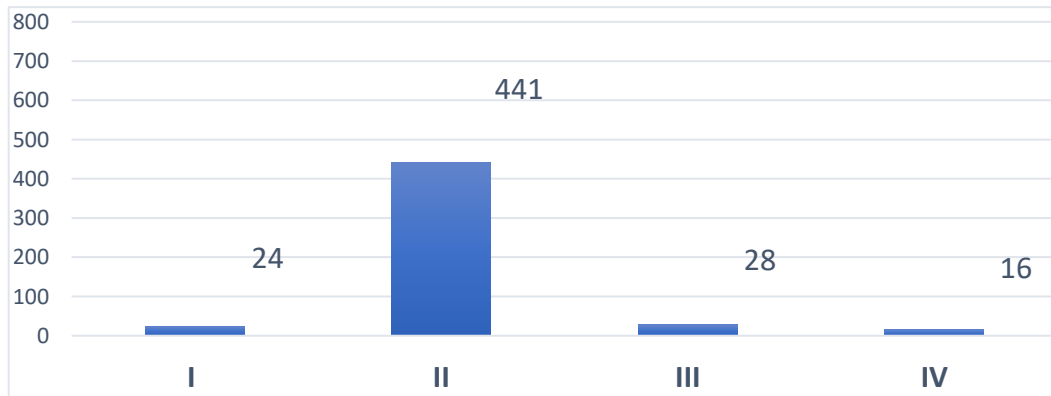
I - skin damage;

II - subcutaneous tissue damage;

III - damage to the superficial fascia;

IV - damage to muscles and deep fascial structures;

The degree of damage to soft tissues of the patients examined by us: 86% - II degree, 4.7% - I degree, 5.5% - III degree and 3.1% - IV degree injuries were detected (Fig. 3).).



Rice. 3 Distribution of patients according to the level of damage.

The main point of a positive result in the treatment of these patients is early diagnosis, which consists of a complete clinical examination in the early stages to determine the severity of local inflammatory changes and tension in the affected area. Ultrasound is used in suspicious cases; radiography; computed tomography; laboratory indicators of poisoning. Damage to soft tissue structures during surgery was determined by determining tissue viability (color, bleeding, density); the duration of the pathological process; the nature of the allocations; bacteriological and cytological examination. For early diagnosis of patients, we used a score scale that allows us to determine indications for surgical treatment based on specific clinical signs and scores.

This scale was used in 176 patients (34.5%) with purulent-inflammatory diseases of soft tissues in different locations. In addition, all patients were receiving inpatient treatment in other institutions before being admitted to our clinic. 21.8 percent (111) of them were treated for phlegmon, 32 (6.3 percent) for carbuncle, 24 (4.7 percent) for anaerobic phlegmon, and 9 (1.8 percent) for lower extremity rubella. As the treatments received were ineffective, these patients were transferred to our department.

159 patients had a total score of 18 to 22, which clearly indicated an indication for surgical intervention. All of them were operated on, and the decay process took up a very large area.

During the study, 17 patients had a score below 18, and they used instrumental research methods such as radiography, ultrasound of the extremities, computer tomography, and dynamic monitoring. I would like to emphasize that, according to instrumental studies, the inflammatory-necrotic process is not always detected, diagnostic sections give a reliable picture of the changes that have occurred. These patients also underwent surgery and were diagnosed with necrotizing infection.

The results of the study showed a positive effect of using this method clearly in the early stages of the course. It is distinguished by its simplicity and convenience, with the possibility of suggesting the development of the purulent-inflammatory process in soft tissues.

Table 4. scale for early diagnosis of soft tissue surgical infections.

	Clinical symptoms	Ekspressiveness	Points	Decoding
1	Local hyperemia	None	0	18-22 - indication for surgery 100%
		weakly expressed	1	
		pronouncement	2	
2	Pain	None	0	
		pulsating	1	
		explosion	2	
3	Hyperthermia	up to 36.6	0	
		36,7-38,0	1	
		above 38.0	2	
4	Dysfunction	None	0	
		Available	1	
5	Local swelling	None	0	
		up to 100 cm	1	
		100-200 cm	2	
		above 200 cm	3	
6	Compatibility *	soft	0	
		difficult	1	
		hard with soft spots	2	
7	Suppuration	None	0	
		Available	2	
8	Necrosis *	None	0	
		Available	2	
9	Cyanosis	None	0	
		limited	1	
		general	2	
10	Crepitus*	None	0	
		Available	2	
11	Bullae*	None	0	
		Available	2	
12	Lymphadenitis	None	0	
		Available	2	

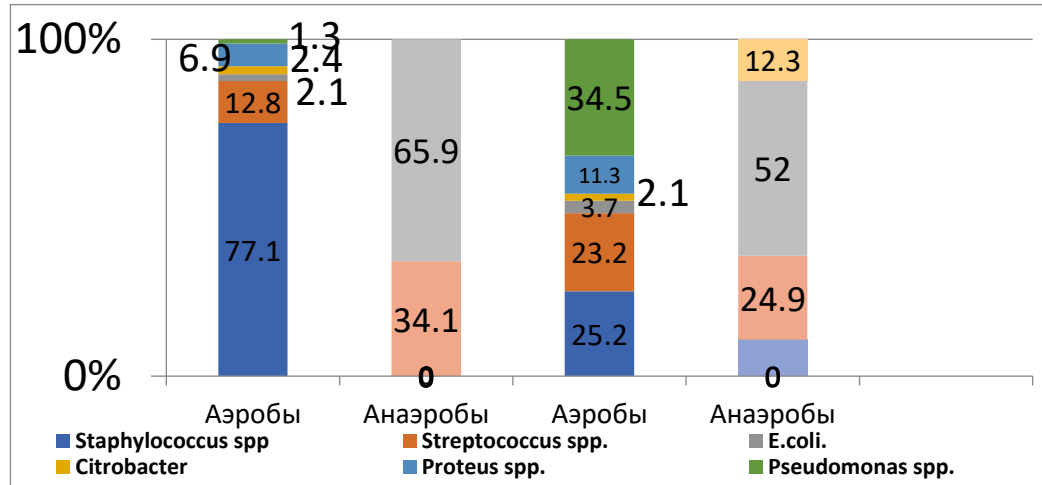
**if there are 4 signs, it is necessary to suspect the presence of a necrotic process in soft tissues in patients with diabetes and use its rating.*

Results and its discussion

The principles of treatment of patients we followed consisted of short preoperative preparation, prophylactic empiric antibacterial, antifungal therapy, and surgical intervention. Patients with diabetes were transferred to insulin therapy.

A distinctive feature of surgical intervention is an aggressive approach, the essence of which is the wide enough opening of the pathological focus and the maximum excision of all necrotic masses within healthy tissues, if the anatomical location allows it. Wounds were left open to control the dynamics of the wound process and the possibility of staged necroctomies. Later, the patients closed the wounds by applying secondary sutures or performing free autodermplasty. During bacteriological studies, it was found that the spectrum of microflora was different in primary and secondary patients (Fig. 4).

If the dominant representatives of the main patients are staphylococci spp. streptococci _ spp. , and from anaerobes Bacteroides spp. and peptostreptococci spp. , then polymicrobiality increased in secondary patients, a resistant form of staphylococcus appeared. aureus, Proteus spp. , Citrobacter and Pseudomonas spp. . Bacteroidetes identified with anaerobes spp. , Peptococci spp. and Fusobacterium spp.



Picture No. 4. Characteristics of wound microflora in purulent-inflammatory soft tissue damage.

When studying the sensitivity of microbes to antibacterial drugs, it was found that the highest sensitivity of pathogenic staphylococci was determined to IV generation cephalosporins and semi-synthetic penicillin - piperacillin sodium and beta-lactamase inhibitor tazobactam sodium. In addition, in the presence of strains resistant to methicillin, sensitivity was determined only to vancomycin.



High sensitivity for fluoroquinolones was found in the detection of other microorganisms. Anaerobic microorganisms were sensitive to ornidazole, chloramphenicol and β -lactam antibiotics - carbapenems.

In connection with the detection of contamination and an aerobic-anaerobic association, we began empiric therapy, which included the use of a combination of broad-spectrum antibiotics that act on aerobes and anaerobes, as well as with a high penetration ability. Later, according to the results of bacteriological examination, antibiotic therapy was carried out depending on the sensitivity of the isolated microorganisms. A mandatory condition was the prescription of antifungal drugs - fluconazole or itraconazole.

Surgical treatment varies depending on the degree of involvement. Thus, at the I level, the abscess was opened, the mandatory component of local treatment is in the form of a differentiated approach, when hyperosmolar ointments are used, and with the local drug FarGALS, proteolytic enzymes and dimexide.

At the II level, necroctomy and open treatment, autopsy with staged necroctomy is mandatory.

At level III, the above stages are supplemented with the possibility of using drainage through the stream with open daily monitoring.

At the IV level, a suture with drainage was performed with the possibility of more open observation of the dynamics of the wound.

The length of treatment for these patients depends on the depth of the soft tissue injury, with grade 1 patients staying in the hospital for an average of 5.7 ± 0.4 days and for deeper grades and in the presence of a combined lesion, these patients treated for an average of 24 days (Table 5).

Table No. 5. Duration of treatment.

Table 5

	I	II	III	IV
I step	$2,2 \pm 0,3$	$2,6 \pm 0,4$	$2,9 \pm 0,3$	$3,2 \pm 0,3$
II step	$2,1 \pm 0,2$	$10,8 \pm 0,7$	$12,3 \pm 0,7$	$14,1 \pm 0,6$
III step	$1,4 \pm 0,5$	$5,7 \pm 0,5$	$6,4 \pm 0,5$	$6,7 \pm 0,4$
Total	$5,7 \pm 0,4$	$19,1 \pm 0,6$	$21,6 \pm 0,6$	$24 \pm 0,5$

According to the results of treatment, recovery was noted in 24.1% of cases, i.e. These patients were discharged with clean wounds. In 74.5% of cases, patients were discharged with wounds that were an open process, without signs of inflammation, with signs of partial dry rejection necrosis. Mortality was observed in 7 patients and was 1.4% (Table 6).



Table No. 6. Treatment results.

Duration of treatment	I	II	III	IV
Stationary	5,7 ± 0,4	19,1 ± 0,6	21,6 ± 0,6	24 ± 0,3
Outpatient	4,2 ± 0,3	6,7 ± 0,3	15,1 ± 0,9	16,7 ± 0,8
Recovery 117 (24,1%)	24 (100%)	87 (17,1%)	4 (0,8%)	2 (0,4%)
Clinical recovery 385 (74,5%)		353 (69,3%)	21 (4,1%)	11 (2,2%)
Mortality rate 7 (1,4%)		1 (0,2%)	3 (0,6)	3 (0,6%)

Thus, the results achieved in the treatment of patients with severe forms of surgical infections of soft tissues are primarily related to the system of early diagnosis and the organizational and therapeutic measures developed in the clinic: the pathological focus radical surgery, bacteriological monitoring and targeted antibacterial therapy. In the treatment of surgical infection developed against the background of diabetes, it is necessary to take into account the depth and size of tissue damage. Depending on the depth of damage, it is necessary to distinguish the nature of surgical intervention. In the postoperative period, a differential approach is required depending on the stage of the wound process, and in the 1st stage, the degree of tissue damage should be taken into account.

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