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## Research Article

# TREATMENT OF PURULENT-NECROTIC COMPLICATIONS OF SOFT TISSUES IN DIABETES MELLITUS

Submission Date: September 16, 2023, Accepted Date: September 21, 2023,

Published Date: September 26, 2023 |

Crossref doi: <https://doi.org/10.37547/TAJMSPR/Volume05Issue09-04>

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## ABSTRACT

One of the frequent complications of diabetes mellitus (DM) is the lesion of human blood vessels, leading to the development of diabetic foot. Literature and daily practical observation show an increase of the rate of diabetic foot (30-70%), which raises the actuality of the problem of diabetic foot treatment. This article contains data concerning the results of surgical treatment of 151 patients with diabetes mellitus complicated by diabetic foot and purulent-necrotic soft tissue inflammation. Our work presents the basic principles of treatment of purulent-necrotic complications of diabetes mellitus. The effectiveness of local application of Acerbin solution and two-stage surgical tactics in the complex surgical treatment of purulent-necrotic complications of diabetes mellitus has been proved.

## KEYWORDS

Diabetic foot, purulent-necrotic complications, Acerbine.

## INTRODUCTION

One of the frequent complications of diabetes mellitus (DM) is damage to the blood vessels of the human

body. High blood sugar level leads to narrowing of the vascular lumen. Reduced vessel calibre is one of the

main causes of reduced blood flow, most often to the tissues of the lower limbs.

One of the formidable complications of diabetes mellitus is diabetic foot. Diabetic foot is caused by damage to the vessels and nerves of the extremities.

In recent years, according to the literature and daily practical observation shows an increase in the frequency of diabetic foot due to smoking, annual increase in the number of patients with obesity and arterial hypertension. In the formation of diabetic foot ulcers, a major role is played by mechanical factors (high pressure on the feet when walking, friction on shoes, various blunt traumas). Due to neuropathy when walking develops deformation of the foot, leading to increased pressure in certain points of the foot. In case of prolonged walking under the influence of a mechanical factor, an ulcer develops, which can easily become infected.

#### AIM OF THE STUDY

To improve complex, local and surgical treatment with the use of new technologies.

#### MATERIALS AND METHODS OF RESEARCH

151 patients with diabetes mellitus complicated by diabetic foot and purulent-necrotic inflammations of soft tissues were observed in purulent-septic department of Samarkand city medical association and multidisciplinary clinic of SamSMU. Among the examined patients 87 were male, women-64. The age of patients with diabetes mellitus ranged from 30-78 years. From them the persons aged from 30 to 60 years prevailed. The duration of diabetic history of the examined patients ranged from 8 to 22 years. Associated cardiovascular diseases were detected in 76% of patients, renal - in 54%, hepatic, gallbladder and biliary tract diseases - in 51% of patients.

Type I diabetes mellitus (DM) was detected in 12 (7.9%) and DMII-type in 139 (92.1%) patients. Severe form of this disease was registered in 48% of patients, moderate - in 41% and mild - in 11% of patients.

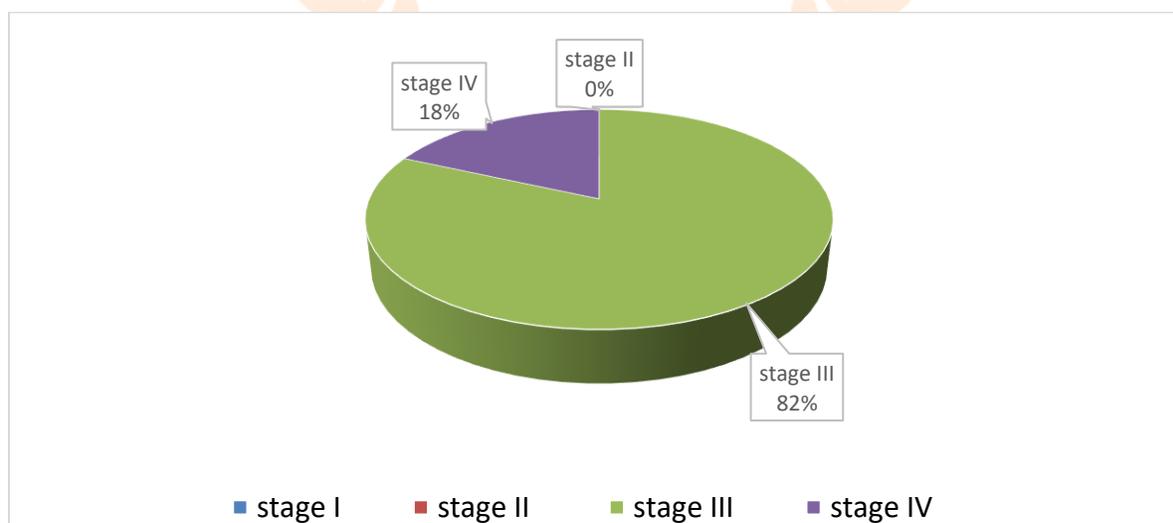


Figure 1: Distribution of patients depending on the severity of tissue damage in diabetic foot syndrome according to the classification of Wagner F.M (1981).

During surgical treatment, we used the WagnerF.M (1981) classification used to assess the degree of severity of tissue damage in diabetic foot syndrome. According to this classification, among the observed patients, the 2nd degree of lesions was found in19 (12.5%), the 3rd degree - in108 (71.5%) and the 4th degree - in 24 (16%) patients. Wet necrosis of the toe tissue was detected in101 (66.9%) patients, dry necrosis - in50 (33.1%). Ischaemic ulceration of the calcaneal region occurred in37 (24.5%) patients. Ischaemic blisters in the foot area were found in40 (26.5%) patients, gangrene of one toe was found in38 (25.1%) patients, two toes in 24 (15.9%), three toes in27 (17.9%) and all toes in22 (14.6%).

During their stay in hospital, patients underwent blood and urine tests, biochemical analyses to determine blood and urine sugar content, ECG, chest X-ray and radiography, ultrasound, limb Dopplerography, foot bone X-ray, computed tomography and angiography of the lower limbs.

Results and discussion of materials: Our observations showed that the clinical manifestation of diseases developed according to the degrees of soft tissue damage by purulent-necrotic complications. In neuropathy, muscle atrophy develops, followed by toe deformities. Due to the development of deformation of the toes of the foot, calluses and, gradually, trophic ulcers appear. With the development of ischaemia in

the tissues of the foot appear purulent-necrotic phlegmons.

Purulent-necrotic phlegmons in diabetic foot syndrome often lead to sepsis, which greatly complicates treatment. The basis of this condition in diabetes is not only disorders of carbohydrate metabolism, but also disorders of protein and fat metabolism. Profound changes contribute to impaired function of the liver, kidneys, cardiovascular and nervous systems.

Purulent infection adversely affects metabolism, acidosis develops, the body's defence function weakens, and the infection spreads throughout the body. In this condition, we often observed the development of purulent necrotising fasciitis in patients. In the treatment of purulent-necrotic complications of diabetic foot syndrome our tactics were based on the following basic principles: dynamic observation of blood sugar content and its correction, antibiotic therapy and control of its effect, treatment of concomitant diseases, accurate determination of the form of diabetic foot and its severity, use of local treatment.

Our primary goal was to remove the foot from the state of critical ischaemia, in addition we paid special attention to the traditional treatment, i.e. immunocorrection and infusion-transfusion treatment.



**Figure 2: The patient's foot preoperatively.**

In the surgical treatment of diabetic foot according to modern requirements, early diagnosis and wide dissection of phlegmon is necessary. After evacuation of pus it is necessary to perform a thorough revision, if necessary fasciotomy and necrectomy.

It is worth noting that even in the infiltrate stage diabetic foot phlegmons should be opened with wide skin incisions and fasciotomy, which significantly reduces the pressure in the soft tissues, preventing ischaemia.



Figure 3. The patient's foot on the 4th day after surgery.

The main task of surgical treatment of purulent-necrotic complications of diabetic foot is to save the limb from high proximal amputations. Therefore, in recent years we have introduced in practice a two-stage surgical treatment. At the first stage, depending on the size of purulent-necrotic phlegmon, we made relaxing long incisions, wound revision, fasciotomy and

necrectomy. Carefully performed wound sanitation and adequate drainage. In recent years we have started to use Acerbin solution, which has keratolytic, antiseptic, analgesic and accelerating wound healing effect. At the second stage, if indicated, radical surgery was performed - stage necrectomy three to eight times.



With

Fig.4 Illustrations Patient M. 39 years old. Has been suffering from type II diabetes mellitus for 12 years. Complication - diabetic foot on the right side. Purulent-necrotic phlegmon of soft tissues of the right foot. The patient underwent duplex scanning of the lower extremities. The trunk blood flow was preserved. The patient underwent transmetatarsal resection (Sharpe operation). Postoperative angiography confirmed the correctness of this tactics.

In the interstage period, we managed to stabilise the general condition of the patients and to bring the affected limbs out of critical ischemia.

Sharpe amputation of the foot was performed in 37 (24.5%) out of 151 patients, disarticulation of one toe in 23 (15.2%), two toes - in 24 (15.9%), three toes - in 27 (17.9%), all toes - in 22 (14.6%) patients. Amputation at the thigh level was performed in 4 (2.6%) patients, amputation at the tibia level - in 4 (2.6%). When determining the level of limb amputation, besides objective data we used the results of Dopplerography and angiography.

application of the above mentioned surgical tactics of treatment we achieved a decrease in the number of proximal operations from 20% to 7.5%.

#### CONCLUSION

Thus, local application of Acerbin solution and two-stage surgical tactics is the optimal way of complex surgical treatment of purulent-necrotic complications and diabetic foot in diabetes mellitus.

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