

## MODERN ASPECTS OF THE DIABETIC FOOT CARE

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**Abstract:** The treatment of the diabetic foot requires a multidisciplinary approach by the specialists, for the classification and the management of the lesions. Efficient care of diabetic foot wound assumes elaborating a therapeutic program adapted to local human and material resources. The screening and diagnostic of diabetic foot must identify etiopathology factors, concomitant diseases, ulceration and clinical aspects. Frequent association of peripheral neuropathy and topographic features of arterial obstruction may orient the diagnosis at diabetic patients and prompt and efficient treatment may prevent or stop the progression of the lesions.

**Cuvinte cheie:** picior diabetic, îngrijirea piciorului, prevenirea leziunilor

**Rezumat:** Terapia piciorului diabetic necesită o abordare multidisciplinară de specialiști în vederea clasificării leziunilor și a managementului. Îngrijirea eficientă a plăgilor piciorului diabetic presupune elaborarea unui program terapeutic adaptat resurselor umane și materiale locale. Screeningul și diagnosticul piciorului diabetic trebuie să aibă în vedere identificarea factorilor etiopatogenetici, afecțiunile "concomitente", prezența ulcerărilor și aspectele ei clinice. Asocierea frecventă a neuropatiei periferice și caracteristicile topografice ale obstrucțiilor arteriale pot orienta diagnosticul la pacienții diabetici iar tratamentul prompt și eficient poate preveni sau opri progresia leziunilor.

### SCIENTIFIC ARTICLE OF BIBLIOGRAPHIC SYNTHESIS

Although diabetic foot affections were known and described since Middle Age in Avicenna's articles (980-1037) then in Falopius studies (XVIIth century), or in antiquity in EBERS writings (1500 BC), the presence of molds and antique statues with the aspect of arterial lesion limbs, complication treatment suffered alterations during time. Current knowledge about diabetes and vascular pathology impose correlation of surgical treatment with endocrinology as well as a therapeutic educational program for diabetic patients. Various classifications for evaluating the diabetic foot lesions (diabetic neuropathy stage formulated by Mayo Clinic, mentioned by Tanenberg, evaluation of diabetic foot ulcer by Wagner - Meggit, Edmond and Foster staging) in order to improve therapeutic approach of the complicated diabetic foot and the results of the past two decades in specialised centers in Europe (Holland, Sweden) managed to lower amputation rate to 49 - 85%.

#### Diabetic foot care in pre-lesion stage

The management of diabetic foot care in this stage aims to maintain employment in this stage, by holding mechanical, metabolic and educational control. Mechanical control addresses to adequate shoe use and rigorous monitoring of minor foot problems. Metabolic factors treatment that predispose to neuropathy and ischemia aims to hyperglycemia, arterial hypertension, hyperlipemia control and giving up smoking. Educational control is extremely important for preventing complications and needs full cooperation from the patient. Auto-examination and daily care of the feet as well as annual medical examination of the feet must be a part of the diabetic patient care program.

#### Diabetic foot care in high risk stage

Employing the diabetic foot in this stage assumes the existence of one or more risk factors for ulcer appearance: neuropathy, ischemia, foot deformities, callus and transpiration. Care management of the foot consists in dry skin care using hydration creams, staging the physiopathologic form : neuropathic or neuro ischemic. After confirmation of peripheral vascular affection antithrombotic treatment starts. Physical exercises, metabolic and educational control may help slowing down vascular and soft tissue deterioration processes. General inadequate individual approaches must be avoided. Education must be intensive, individualized and continuous and medical evaluations must be biannual or even every four months.

#### Diabetic foot care with ulcerative lesions

Diabetic foot ulcerations, neuropathic as well as neuro ischemic, may aggravate rapidly, skin lesions representing a bacterial way in thus every ulceration must be controlled and individually evaluated. Treatment strategy assumes transformation of ulcerations in "acute" lesions which retake physiological cycle towards healing and aims to ulcer cure in 6 weeks. It aims avoiding local pressure points, inflammatory response monitoring and microbiological effects evaluating antibiotic use possibility, improving wound self care techniques. The absence of a favorable response in six weeks may be due to ischemia and the possibility of a vascular intervention must be quantified and taken in consideration. Surgical treatment of the wound means debridement adequate dressing, exudate drainage and removal of devitalized tissue. In case of reduced exudative wounds are indicated hydrogel, semi-permeable film, hydrocolloid products and in case of abundant exudate are indicated alginate calcium or hydrophobic products covered with secondary dressing.

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Hydrogel products contain insoluble polymers which increase their volume, up to saturation, facilitating epithelization by maintaining a humid medium at the surface of the wound. It is not used in case of suspicion of anaerobic infection.

### **Diabetic foot care in cellulitic stage**

Clinical signs of cellulitic leg may be undercover by the presence of neuropathy and/or ischemia, infection of diabetic foot being aggravated by the existence of immune system deficiencies. A multidisciplinary approach and a rapid evaluation of the lesions is imposed in order to prevent tissue loss. Infection features are: lower temperature of the feet than needed for development of most pathogenic bacteria, fat acid excess and low pH of plantar and dorsal surfaces and corneum thickness in the plant. Care management assumes introducing cavitory dressings and use of large spectrum antibiotics, surgical debridement of the wound and surgical re-vascularization interventions (angioplasty or by-pass). Protection against bed sores is important. Metabolic and educational control must monitor risk factors and help the patient to protect his/hers health.

### **Foot care in necrotic stage**

Wet necrosis is the most frequent necrosis of diabetic foot and appears when there is an uncontrolled infection of the foot which determines septic vasculitis. Dry necrosis, acute or chronic is caused due to poor tissue perfusion. Lesion approach assumes surgical debridement and vascular control: neuropathic foot which presents palpable arterial pulse does not necessitate surgical intervention and neuro ischemic foot needs investigations that confirm ischemia (echo Doppler, angiography). Percutaneous angioplasty and by-pass may optimize perfusion and increases chances of tissue salvage. Debridement methods include humid gauze with physiologic serum, bio-surgery (sterile larvae), surgical debridement as well as non-mechanic debridement: polysaccharides powders and pastes (Dextranomer, cedexamer iodine) enzymatic agents (trypsin, streptokinase), hydrogel applied directly on wound bed and held with nonadherent dressing.

Apart from amorphous gels, hydrogel-plaques are available. Debridement is a critical component in preparing the wound bed in order to heal. Non-mechanical debridement techniques increased amongst wound cleaning methods and include: enzymes, hydrogel and chemical specific components. The patients with dry necrosis need fast intravenous treatment with a large spectrum antibiotic. The antibiotic treatment is also prescribed for those with humid contaminated necrosis. The metabolic control can appeal to the use of insuline. The mechanical and educational control must underline the importance of resting in bed and avoiding applying pressure on the affected areas.

### **Foot care in major amputation stage**

Patients who suffered major leg amputation despite interventions for infection treatment or leg reperfusion, necessitate longer period for rehabilitation. Non-amputated part presents a high risk of amputation in the absence of an adequate treatment. Plastic reconstructive surgery is necessary sometimes in repairing important tegument defects. As methods can be used autologous skin grafting or skin flaps mobilization. Unfortunately amputations currently represent a frequent resolution of diabetic foot complications, especially diabetic gangrene.

importance of diabetic foot care may be key components of the success.

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## CONCLUSIONS

Diagnostic and treatment adapted to the degree of severity of foot affection in diabetic mellitus patients, coordinated training professionals in the field and medical services efficiency as well as the enthusiasm and believe in the