

Background. Vacuum-assisted closure, sometimes referred to as microdeformational wound therapy or negative pressure wound therapy, has revolutionized wound care over the last 15 years. This article describes our current understanding of these technologies, the questions that remain, and what the future may hold for technologies based on mechanotransduction principles.

Aim of the study. This study was aimed to clarify if vacuum therapy would improve healing of diabetic purulent ulcers and affect microbial contamination and matrix metalloproteinase (MMP) activity in tissues of wound surface.

Materials and Methods. The results of treatment and clinical examination of 48 patients with chronic diabetic wounds of soft tissues were analyzed. In 26 patients (study group), vacuum therapy of wounds was used in the treatment complex. During healing process, conventional bacteriological and cytological parameters were determined. MMP activity in wound surface tissues at the various stages of wound healing was monitored by gelatine zymography.

Results. It was shown that wound purification from necrotic material and microorganisms appeared to be on 5.2 ± 1.5 days more rapid compared to control group. Moreover, in wound surface tissues of patients from study group, statistically significant ($P < 0.05$) decrease in MMP activity was observed to be 68 and 45 % of the initial value at 5-th and 10-th days after onset of vacuum application, respectively. In wounds of conservatively treated patients, collagenolytic activity remained consistently elevated throughout the whole period of examination.

Conclusions. It is concluded that along with anti-microbial and anti-inflammatory effects, normalization of proteolytic processes in diabetic wounds may be one of the key mechanisms underlying the high healing efficacy of VAC-therapy.