

CHARACTERISTICS OF THE EFFECTIVENESS OF PLASTIC CLOSURE OF SOFT TISSUE DEFECTS IN PATIENTS WITH PRESSURES IN THE SACRAL REGION

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Resume. Preoperatively, especially in patients with recurrent disease, it is advisable to include an MRI of the sacrococcygeal region in the diagnostic algorithm. This will allow for accurate determination of the absence of bone damage, the extent of the pilonidal cyst, and an informed decision on the use of a plastic method for wound closure.

Key words: bedsore, plastic surgery, soft tissue defects

Relevance. The problem of unsatisfactory results following plastic closure of soft tissue defects remains far from definitively resolved and retains a significant number of unresolved issues of both theoretical and practical nature [1,3,5]. The presence of a deep defect, a cavitory component, and soft tissue structural abnormalities form the structural and functional basis for wound failure, which manifests itself in the postoperative period as unsatisfactory results and recurrence [1,4].

Unfortunately, according to domestic and international studies, the recurrence rate of the disease after radical surgical interventions, according to surgeons, reaches values above 50% [1,2], while the incidence of postoperative wound complications can reach up to 30% [2]. With median tight suturing of the postoperative wound defect of the sacrococcygeal region, the incidence of postoperative wound complications is 14-74%, and relapses occur in 4-45% of cases [94]. At the same time, some researchers notice postoperative wound complications and recurrent cases of the disease (relapses) when using plastic methods of wound closure after excision complications were observed in 11% of patients, and the relapse rate was 2.7% [1]. Using the method developed by Bascom, the recurrence rate was reduced to less than 10 percent, and postoperative complications were recorded in 6.7% to 27.5% of patients [3]. The method of plastic closure of the sacrococcygeal wound defect after PC removal using a Limberg flap reduced the recurrence rate to less than 8 percent, and the wound complication rate ranged from 11.5% to 19.6% [2,3], although, in our opinion, even these results are far from ideal.

Studying the combination of these factors is fundamental for the development of objective risk assessment criteria and the improvement of reconstructive and plastic surgical treatment methods for patients with sacral pressure ulcers.

The aim of the study was to evaluate the effectiveness of plastic closure of soft tissue defects in patients with sacral pressure ulcers.

Material and methods. In the preoperative period, statistically significant differences in the morphometric characteristics of wound defects were identified in 53 patients depending on the chosen method of plastic closure.

Results and discussion. The results of the correlation analysis showed that the wound defect depth has the strongest association with worsening outcomes, with a correlation coefficient of $r=0.881$. Moreover, in clinical observations, wound depth was almost always associated with the presence of a cavity, which was recorded in a significant proportion of patients and also demonstrated a high correlation with the outcome ($r=0.724$). We observed a clinical case where patients with stage III-IV sacral pressure ulcers developed a wound greater than 3 cm deep with undermined pockets in the lateral sections after staged necrectomy. Despite the externally satisfactory condition of the granulation, a cavity still remained, spreading laterally. We also established a direct high correlation with unfavorable outcomes for microbial contamination of the wound ($r=0.748$; $p < 0.001$).

When analyzing the cytological parameters, we identified a correlation pattern in which an increase in the proportion of neutrophils to 57.1% and degenerative forms to 66.4% was accompanied by an increase in the frequency of unsatisfactory outcomes, with the correlation coefficients being $r=0.571$ and $r=0.664$, respectively ($p < 0.001$). We also noted a decrease in the content of macrophages and fibroblasts, for which an inverse correlation was found with an increase in unsatisfactory treatment results ($r=-0.516$ and $r=-0.603$, respectively).

The conducted correlation analysis allows us to identify a set of local factors that determine the nature of the course of the wound process and the postoperative results of plastic closure of soft tissue defects in patients with pressure ulcers in the sacral region.

Tirsch- assisted wound closure, we found the strongest correlation with worsening outcomes for wound defect area ($r=0.682$). An increase in area was accompanied by an increased incidence of partial and complete graft failure, indicating the importance of the extent of the skin coverage zone and the wound surface volume. In patients with a defect area greater than 120-140 cm², despite a relatively shallow depth, extensive graft zones developed, where uneven skin flap engraftment was observed even with uniform granulation. On days 4-6 postoperatively, areas of epidermal lysis appeared along the periphery, gradually transitioning to secondary healing, despite the absence of a pronounced cystic component affecting the healing process.

A moderate positive correlation was found for wound microbial contamination ($r=0.556$; $p=0.002$), as well as for inflammatory and degenerative changes in the cytogram. An increase in the correlation coefficient for the proportion of neutrophils to $r=0.524$ and its degenerative forms to $r=0.548$ was accompanied by worsening outcomes, while the number of macrophages and fibroblasts demonstrated an inverse correlation ($r=-0.437$ and $r=-0.512$, respectively). This distribution reflects the dependence of the result on the maturity of the granulation tissue and the condition of the wound surface. When using autodermoplasty according to the Thiersch method, the key factors in worsening

the outcome are the area of the defect, microbial contamination, and the inflammatory nature of the wound process, while the depth of the wound and the presence of a cavity play a secondary role.

Limberg- approved closure of a persistent wound, the leading factors determining an unfavorable outcome were wound defect depth and the presence of a cavity. The correlation coefficients were $r=0.804$ and $r=0.821$, respectively, indicating the predominant role of the wound's volumetric component.

Cytological parameters in this group also had a significant correlation with outcomes, with an increase in the proportion of degenerative neutrophils ($r=0.671$) and a decrease in fibroblasts ($r=-0.617$) reflecting the persistence of the inflammatory component and the inadequacy of reparative processes. Macrophages demonstrated a negative correlation ($r=-0.498$, $p=0.013$), indicating their protective role in the formation of a mature wound bed.

Limberg repair, the geometric characteristics of the defect are crucial, primarily the depth, presence, and direction of the cavity, while the infection factor and wound area play a secondary role. These parameters determine the mechanical conditions in the reconstruction area and determine the risk of failure of the plastic closure of the pressure ulcer.

A comparison of the results of the correlation analysis in the overall group and in the separate evaluation of plastic closure methods revealed that the development of unsatisfactory surgical outcomes is determined by a combination of local clinical and morphological changes, among which the leading roles belong to the geometry of the wound defect and the condition of the wound bed. The most pronounced association with worsening outcomes was noted for wound depth and the presence of a cystic component, with a simultaneous increase in the influence of microbial contamination and inflammatory-degenerative changes in the cytogram, while the macrophage-fibroblast component demonstrated a protective effect.

With continued pressure over the bony prominence, a soft tissue deficiency develops that persists even after radical surgical debridement. Deep defects with a cavity are characterized by a minimal tissue layer remaining over the sacrum, unable to ensure uniform load distribution.

After plastic closure, this layer is exposed to maximum pressure, leading to repeated microcirculation impairment, tissue hypoxia, and the gradual development of ischemic changes. Furthermore, the condition of the wound bed, determined by the cytological picture, plays a key role. A predominance of neutrophils with a high proportion of degenerative forms reflects the ongoing inflammatory process and insufficient maturity of the granulation tissue. Microbial contamination exacerbates these changes, but its influence is realized primarily through the maintenance of the inflammatory environment. A high bacterial load contributes to persistent tissue infiltration, increased vascular permeability, and impaired regeneration processes. The species composition of the microflora is less important than the quantitative contamination, since even with a single infection and high bacterial load, the risk of suppurative and secondary repair failure remains. In clinical observations, this

was manifested by the development of serous-fibrinous discharge and divergence of the wound edges in the early postoperative period.

The pathogenesis of unsatisfactory results of traditional methods of soft tissue closure for sacral pressure ulcers is determined by a combination of two key mechanisms. The first is due to the lack of sufficient soft tissue volume over the sacrum, which leads to persistent compression and ischemia in the reconstruction area. The second is due to the location of the suture line in the pressure zone and tissue tension, which disrupts the flap's blood supply and contributes to the development of marginal necrosis.

CONCLUSIONS.

1. A combination of morphometric and biological factors forms two key pathogenetic mechanisms that determine unsatisfactory results of plastic closure of soft tissue defects in patients with sacral pressure ulcers.

LITERATURE

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