IMMUNOLOGICAL FEATURES OF PATIENTS WITH POSTOPERATIVE VENTRAL HERNIAS

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Relevance: Postoperative ventral hernias (PVH) remain one of the most challenging problems in abdominal surgery. The high frequency of complications, recurrences, and nonspecific immunological reactions necessitates the search for effective methods of prevention and treatment. Modern hernioplasty techniques using synthetic materials, such as polypropylene meshes and titanium implants, provide high effectiveness; however, the selection of the optimal material and assessment of the patient's immune response remain relevant issues.

Aim of the Study: To improve the effectiveness of treatment for patients with PVH by optimizing the surgical strategy, taking into account the pathogenetic and immunological characteristics of the disease.

Materials and Methods:

Retrospective study of 130 patients with PVH treated from 2016 to 2018: 56 men (43%) and 74 women (57%), mean age 55.5±1.7 years. Patients were divided into two groups: Group I (55 patients, 42.3%) — hernioplasty using local tissues; Group II (75 patients, 57.7%) — alloplastic repair with polypropylene mesh implants ("Esfil"). Prospective observation of 112 patients treated from 2019 to 2022 using polypropylene and titanium mesh implants

("Titanly Ipak"), with assessment of systemic inflammatory response (TNF-α, IL-6, IL-8, IL-4, IL-10). Immunological study of 28 patients with PVH, including assessment of lymphocyte subpopulations and cytokine levels (IL-4, IFN-γ). Statistical analysis: non-parametric tests (Mann–Whitney U test, Spearman rank correlation), qualitative variables — χ^2 test, significance level $\alpha=0.05$.

Results:

Patients with normal body weight showed decreased $CD8^+$ and increased $CD4^+$ lymphocytes; patients with obesity demonstrated decreased $CD3^+$ and $CD16^+$ lymphocytes and disrupted $CD4^+/CD8^+$ ratio.

TNF-α, IL-6, and IL-8 reached peak levels on the 7th postoperative day, especially with the use of polypropylene meshes, indicating a more pronounced systemic inflammatory response.

Use of titanium implants was associated with moderate cytokine dynamics, reduced risk of excessive inflammation, and higher bioinertness of the material.

Comparison of polypropylene and titanium implants demonstrated that titanium fibers ensure more uniform load distribution on tissues and reduce the risk of recurrence and complications.

Conclusion:

Pathogenetically and immunologically justified selection of the material and method of hernioplasty allows for a reduction in postoperative complications and recurrences in patients with PVH.

Titanium mesh implants demonstrate a safer inflammatory response profile and high bioinertness, making them preferable in patients with high risk of complications.

The obtained data allow for optimization of the surgical strategy and development of individualized approaches to PVH treatment, taking into account comorbidities and the patient's immune system status.

REFERENCES

1. Basu N.N., Cottam S. Abdominal compartment syndrome // Surgery Journal. — 2018. — V.8. — P. 260–262.
2. Blotta R.M. et al. Collagen I and III in women with diastasis recti // Clinics (Sao Paulo). — 2018. — V.73. — P. 319. — DOI: 10.6061/clinics/2018/e319.
3. Campanelli G. Quality of life is the most important outcome measure of hernia repair // Hernia. – 2022. – № 3. – P. 685–687.
4. Dedic N. et al. The CRF family of neuropeptides and their receptors – mediators of the central stress response // Current Molecular Pharmacology. — 2018. — V.11. - №1. — P. 4–31.
5. Deekena C.R., Lake S.P. Mechanical properties of the abdominal wall and biomaterials utilized for hernia repair // Journal of the Mechanical Behavior of Biomedical Materials. — 2017. — V.74. — P. 411–427.
6. França A.J. et al. The role of kinins in the proliferation of fibroblast primed with TNF in scratch wound assay: Kinins and cell proliferation // International Immunopharmacology. — 2018. — V.65. — P. 23–28.
7. Gądek-Michalska A. et al. Chronic isolation stress affects subsequent crowding stress-induced brain nitric oxide synthase isoforms and hypothalamic-pituitary-adrenal axis responses // Neurotoxicology Research. — 2019. — V.36. - №3. — P. 523–539.