



**COMPARATIVE CHARACTERISTICS OF MORPHOMETRIC  
PARAMETERS OF THE SPLEEN AND THYMUS IN DIFFERENT  
DEGREES OF CHEMICAL BURNS OF THE DIGESTIVE TRACT BEFORE  
AND AFTER CORRECTION**

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**Relevance.** Chemical burns of the digestive tract remain one of the urgent problems of modern experimental and clinical medicine due to the development of severe local and systemic pathological reactions. According to contemporary scientific data, exposure to chemical agents leads to metabolic disturbances, microcirculatory disorders, oxidative stress, and immune dysfunction, which subsequently affect immunocompetent organs (Chernousov A.F., 2018). It has been reported that endogenous intoxication accompanying chemical burns negatively influences the structural and functional state of the thymus and spleen (Bagdasaryan L.A., 2020).

The thymus is considered one of the most sensitive organs to toxic and stress-related factors. Previous studies demonstrated that severe pathological conditions induce accidental thymic involution characterized by cortical thinning, decreased thymocyte density, and impaired T-lymphocyte differentiation (Abdullayev R.A., 2019). Furthermore, the severity of thymic alterations directly correlates with the intensity and duration of tissue injury (Kumar V. et al., 2021).

The spleen, as a peripheral immune organ, also undergoes substantial structural changes during chemical intoxication. Researchers have described disturbances in the architecture of the white and red pulp, reduction in lymphoid follicle size, vascular congestion, and suppression of immune activity in splenic tissue under burn-related intoxication (Ivanov S.V., 2017). In severe cases, destructive cellular alterations and pronounced hemodynamic disorders were also observed (Rahman M. et al., 2022).

Recent investigations have focused on therapeutic correction of pathological changes in immune organs during burn disease. Experimental findings indicate that corrective therapy may reduce destructive processes, improve microcirculation, and partially restore morphometric parameters of the thymus and spleen (Petrova N.N., 2021). Nevertheless, comparative morphometric evaluation of these organs under different degrees of chemical burns of the digestive tract remains insufficiently studied.



**Aim of the Study.** To perform a comparative assessment of morphometric parameters of the spleen and thymus in different degrees of chemical burns of the digestive tract before and after corrective treatment.

**Materials and Methods.** The experimental study was carried out on laboratory animals divided into control and experimental groups according to the severity of chemical burns of the digestive tract. After induction of the pathological process, corrective therapy was administered to selected experimental groups.

The thymus and spleen served as the main objects of investigation. Tissue samples were fixed in 10% neutral formalin and processed according to standard histological techniques. Histological sections were stained with hematoxylin and eosin. Morphometric analysis included measurement of organ mass, cortical and medullary thickness of the thymus, dimensions of splenic lymphoid follicles, and evaluation of white and red pulp structure. Statistical analysis was performed using standard biomedical methods.

### **Results**

The obtained results demonstrated that chemical burns of the digestive tract caused significant morphometric alterations in both the thymus and spleen, the severity of which depended on the degree of tissue injury. In the thymus, cortical thinning, reduction of the corticomedullary index, and decreased lymphoid cell density were observed. Severe burn injury resulted in marked accidental involution of thymic tissue.

In the spleen, morphometric examination revealed a decrease in lymphoid follicle size, expansion of the red pulp, vascular hyperemia, and depletion of cellular components in the white pulp. The most pronounced pathological changes were identified in severe forms of chemical injury.

Following corrective treatment, partial restoration of morphometric parameters was noted. In the thymus, cortical thickness and lymphocyte density increased, while in the spleen, structural organization of the white pulp improved and vascular disturbances became less evident. These findings indicate the beneficial effect of corrective therapy on immunocompetent organs.

### **Conclusions**

1. Chemical burns of the digestive tract induce significant morphometric alterations in the thymus and spleen.
2. The severity of structural damage depends on the degree of chemical injury.



3. The thymus demonstrates the highest sensitivity to toxic exposure, developing features of accidental involution.
4. Corrective therapy contributes to partial restoration of morphofunctional parameters in immunocompetent organs.
5. The obtained findings confirm the important role of the thymus and spleen in systemic pathological reactions associated with chemical burns of the digestive tract.

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