SPECIES CHARACTERISTICS OF MORPHOLOGY OF THE HUMAN SPLEEN AND THE RAT SPLEEN

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Abstract This article is devoted to definition and terminology of separate structural components of the human spleen and the rat spleen, also species characteristics of morphology of the white and red pulp of the human spleen and the rat spleen are shown here too.

Keywords Spleen, marginal sinus, marginal zone, ellipsoids.

The material for the rat spleen morphology study was excised from spleens of 6 mature healthy decapitated rats undergone quarantine inspection.

The material for the human spleen morphology study was excised after autopsy from spleens of 6 humans dying from injuries incompatible with life.

Results

The human spleen differs from the rat spleen mainly by absence of periarteriolar lymphoid sheath and marginal sinus around arterioles. The pulp arteries are not surrounded by collagen fibers but have lymphoid tissue which is getting thin as divided into arterioles and capillary.

Due to absence of the marginal sinus in the human spleen which in animals is a borderline between mantle and marginal zones, it is difficult to differentiate the mantle zone of the lymphoid node which confuses the definition of the term “the marginal zone”.

For example, J. Krieken, J. Te Velde (8) proposed to mark the borderline area between the red and white pulp as “perifollicular zone” and the term “the marginal zone” for the unique splenic structure that is always and exclusively present around the small IgD and IgM-positive lymphocytes of the mantle zone, or “corona”, what to our opinion, is more appropriate when describing the normal and pathological spleen morphology. Whilst, widely used in literature terms “the inner marginal zone” and “the outer marginal”, referring to the perifollicular zone bring discord into definition of the normal structure of the spleen parenchyma.

In the red pulp of the spleen parenchyma one might notice local aggregates of reticular fibers devoid of capillaries formed after postmortem collapse due to a sudden drop of pressure of venous blood in the portal system. The spleen capillaries peculiarity lies in the capillary endings specific only for the spleen and defined differently by different authors as “sheathed capillaries” (hulsekapillaren), ellipsoids (sheath of Schweigger-Seidel), periarterial macrophage sheath, macrophage ellipsoids, ellipsoid macrophage-lymphoid mantle, ellipsoid arterioles and so on. In humans they are present only in the red pulp and perifollicular zone. These capillary sheathes (ellipsoids) are composed of mononuclear phagocytes. The endothelial lining of the capillary ends in a string of concentrically arranged macrophages.

All mentioned structures are well defined in the rat spleen, having well expressed structural aspects of the immune apparatus specific to all types of mammals (9).

Material and Methods

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Fig. 1. Spleen of the rat. Azur-II and eosin. x 100.

Fig. 2. Spleen of the human. Azur-II and eosin. x 100.