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TO THE QUESTION OF ULTRASOUND EXAMINATION OF THE LYMPH NODES OF THE NECK

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Abstract. Ultrasound examination (UE) of physiological and pathological conditions of lymph nodes (LN) is difficult due to the anatomical features of the lymphatic outflow from various organs and tissues of the head and neck. It is necessary to widely use this method of radiation diagnostics as informative, effective and inexpensive. UE of LN is a safe method without contraindications for use and the ability to conduct research among various categories of patients.

Key words: lymph nodes of the neck, anatomical structure, diagnostics, ultrasound examination

Lymphadenopathy as a concept includes inflammatory and non-inflammatory, specific and non-specific changes in the LN, which under physiological conditions can be at rest and activated with increased antigenic load. LN sizes can vary depending on the anatomical regions: from 10–15 mm in the neck to 3–5 mm in the abdominal cavity [1, p. 896]. Lymphadenitis of unclear etiology, while maintaining clinical symptoms without positive dynamics for more than 1 month, prompts the exclusion of diseases of both infectious and tumor nature [2, p. 11].

In the structure of LN, there are:

- 1) capsule;
- 2) subcapsular lymphatic sinuses;
- 3) cortex (intermediate cortical lymphatic sinuses);
- 4) core (cerebral lymphatic sinuses, blood vessels);
- 5) gates (portal lymphatic sinuses, fusion zones of the mouths of afferent lymphatic vessels, blood vessels).

Through the LN capsule, small lymphatic vessels bring lymph from the organs and tissues of the corresponding area of lymphatic drainage. With lymph, viral and bacterial antigens, components of non-viable cells, etc. enter the LN. In response to an increased antigenic load, the lymphatic sinuses located under the LN capsule are the first to activate their work.

Thus, the most reactive sinuses in the LN are located under the capsule, as well as in the cortical part [3, p. 59]. With benign lymphadenopathy, as a result of increased hard work of the LN for an increased antigenic load, hyperplasia of the subcapsular lymphatic sinuses occurs primarily.

Manifestations of benign lymphadenopathy during UE have characteristic manifestations:

1) Increased production of normal lymphocytes in the subcapsular sinuses corresponds to the appearance of a hypoechoic strip under the LN capsule, the width of which largely depends on the intensity of the immune response. This hypoechoic strip is dark in color with a light core (medulla).

2) The dimensions of the LN of the neck in benign lymphadenopathy may vary, however, more often their dimensions exceed 10-15 mm [4, p. 373].

The LN at rest is indistinguishable from the surrounding tissues. This is due to the inability to determine the acoustic transition between the LN and the surrounding tissues. Thus, there is no impedance between the LN, which was not activated (calm) and the surrounding tissues [5, p. 158].

It is possible to visualize LN only after its activation. The degree of acoustic recognition of the LN structure and surrounding tissues will depend on the stage of acute or chronic inflammatory processes with manifestations of benign lymphadenopathy.

In this state, LN are visualized:

1) Clear differentiation of the hypoechoic cortex and the hyperechoic core of the central part.

2) Normally, in most patients, the shape of the LN of the neck (as well as the inguinal LN) is oval. The degree of shape change depends on the intensity of the

inflammatory process. The Salvatini index is the ratio of the transverse and longitudinal dimensions of the LN.

The Salvatini rounding index is only used in the evaluation of the cervical and inguinal LNs, as the LN is always oval in these areas. In other areas of the body, the shape of LN is far from always oval, so changes in the rounding index are less significant in the assessment of LN.

At the beginning of LN activation during UE, the following are observed:

- 1) A significant increase in the size of LN.
- 2) The blood flow velocity in the artery of the LN gate increases above the norm (5 cm/sec) at the level of the LN gate. In benign lymphadenopathy, the blood flow velocity in the LN gate increases to 15–20 cm/sec.

If LNs in a state of activation cannot provide protection against infection by increased production of lymphocytes in the sinuses of the LN, visualization of the blurring of the central section with an expansion of the blood flow zone occurs. In acute lymphadenitis, LN work in a very intense mode of operation, increased blood flow is determined in the gate, cerebral and cortical zones. In chronic infection, LNs are increased, but less than in acute infection. The hypoechoic zone of the lymphatic sinuses under the capsule is also narrowed, the contours of the LN are wavy. Thus, UE allows visualization of benign lymphadenopathies, which is necessary for differentiation from pathological processes.

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