A METHOD OF EXAMINING THE VALVES OF THE LYMPHATIC VESSELS

D. D. Zerbino

From the Department of Topographic Anatomy (Head – Dotsent N. P. Novikov) of the Chernigovskii Medical Institute (Director – M. M. Kovalev)

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One of the characteristic features of the lymphatic vessels is the occurrence of many valves which determine the direction of the lymph flow; they direct the lymph forward and prevent a backward movement in the vessels. However comparatively little work has been done on the structure of these valves, of which only the main features have been studied [1].

The lymphatics have weakly elastic collapsible walls; the valves are very thin and can be seen only with difficulty through the vessel walls. They have been investigated either in serial sections [3, 4], or by the use of special indicators [2]. It is not possible to make any thorough investigation by these means.

We have developed a method by which the valves can be observed from the lumen of the vessel. The method is applicable to lymph vessels of diameter 0.5 mm and above.

The essential feature of the method is that lymph vessels filled with air are infiltrated with methyl salicylate. It is then possible to dissect out different portions of the uncollapsed vessel, when the tighly stretched folds of the valve can be clearly seen. The position of the valve can be readily seen at the constriction of the vessel, which nearly always corresponds to the position of the valve which lies between well-marked dilatations in the valveless portions. After staining, the selected portion of the vessel may be placed vertically and examined with a microscope or binocular loupe; the shape of the valve, the number of folds, and the shape of the spaces between the folds, etc. can then be made out.

The operations should be carried out in the following order: 1) detection of lymphatic vessels by injecting them with Gerota's fluid; 2) separation of the lymphatic vessels on a clean slab; 3) washing the vessels in chloroform until the dye has completely disappeared (using injection syringe and a No. 25 fine needle); 4) inflating the selected vessel with air, using a syringe and fine needle; after inflation both ends of the vessel are tied with a thread; 5) fixation in 5% formol for not less than 24 hours; 6) dehydration through the usual strengths of alcohol; 7) infiltration with methyl salicylate for not less than 5 days until the infiltration of the wall is complete; 8) cutting out segments of the vessels with valves; 9) washing in distilled water; 10) staining in a 1% solution of methylene blue for a few seconds; 11) washing in distilled water; 12) differentiation, if necessary, in absolute alcohol; 13) making the dye fast in a 1% solution of ammonium picrate; 14) second infiltration and clearing in xylol; 15) mounting in Canada balsam, the portion of the vessel with the valve is placed vertically, like a barrel, on a thin layer of thick balsam; the preparation is then covered with a bell jar to avoid dust. After a few days, when the balsam has dried, another thin layer of liquid Canada balsam is added.

SUMMARY

A method of investigating the valves of lymphatic vessels is suggested. The essence of this method consists in placing the lymphatic vessel filled with air into the methyl ether of salicylic acid.

LITERATURE CITED

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* In Russian.