

МОРФОЛОГИЯ СОСУДОВ СЕЛЕЗЕНКИ ЧЕЛОВЕКА

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VASCULAR MORPHOLOGY OF THE HUMAN SPLEEN

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Introduction. Practical and theoretical medicine recently interested in the spleen, which features diverse and important for the body. The spleen is important for the normal functioning of immunobiological status of the organism, performs hemolytic, haemostatic, hemodynamic, protective, hemoregulative, metabolic functions, in connection with the escalated problem saving operations on this organ.

Peculiarities of the spleen as a parenchymatous organ of the main blood supply often traumatic cause organ damage, occurring at present, spontaneous rupture with various underlying pathologies. In connection with the replacement of splenectomy for partial splenectomy in recent years has expanded operative interventions.

To improve the technique of operations on spleen surgeon must know the structure of «vascular feet », the structure of the neurovascular unit spleen, intraorganic bloodstream in the zonal and segmental aspect that will reduce the incidence of forced splenectomy .

This study is part of a comprehensive research theme of the Department of Human Anatomy Kharkiv National Medical University «Morphological characteristics of the endocrine system, the peripheral nervous system under normal conditions and under the influence of certain factors"

Objective: to examine the structural and topographic features of the sources of blood supply of the spleen.

Object and Methods: The study carried out on material taken from 80 corpses of people of all ages and gender. Sources of blood supply to the spleen were studied using anatomical dissection by V.P. Vorobyov, R.D. Sinelnikov .

Results and discussion. The study showed that the spleen supplies by splenic artery which on all our products deviated from celiac trunk and was the biggest of its branches. The length of the artery averaged 90 mm (70-190 mm limit values). To a large extent this rate is dependent on the

age - the older the age, the more pronounced becomes tortuosity of vessels. In 25-30 years vessel nearly straight, and after 30 years it becomes an undulating or curved shape, after 40-50 - form of artery, spiral. The more pronounced this tortuosity of vessels, so it is longer.

It is the constant diameter of the splenic artery. On average it was 7 mm (thresholds - 5-13 mm). Since in this case refers to the outer diameter, age characteristics was shown little in this figure, although we had to detect atherosclerotic plaques, which is largely closed vessel lumen.

From the ventral trunk splenic artery goes to the left, some obliquely downward, followed behind the stomach, settling mostly in upper rear edge of the pancreas, at least - in the parenchyma or the front edge of it. Near the body starts dividing of vessels into branches: in 86 % of cases - at the level of the middle third of the spleen, and in other cases with the same frequency at the level of the upper or lower third of the body. Distance from the gate to the division averaged 35 mm (5-80 mm thresholds).

The branches of the splenic artery of first order involved in the blood supply of certain sections of the spleen and arteries similar to other parenchymal organs (liver, lungs, kidneys), we denoted these branches how zonal arteries and portions of their distribution - arterial zones. By the same analogy branching vascular zone - second order branches, which in this area have vascularization certain part of it - a segment, we denote how segmental arteries. In the process of preparation has been paid attention to the nature of the splenic artery branching. Following the standard classification forms the division of vessels in our material we identified placed form in 82.8 % of cases, trunk - in 17.2%. Each of these forms was characteristic of her features and some options. The most common form occurs loose dividing the splenic artery, in which the vessel is divided by 2 (74.1 %) or 3-4 (8.7 %) branches. The first variant we have marked as dichotomous, the second - as multilateral. When dichotomous division artery formed two branches of order 1 - upper and lower zonal artery. For the caliber they are about the same (41 % of cases) or upper branch a few more or less than the lower (34% and 25 % respectively). Division in these cases can be positioned closer or farther from the gate of organ. Depending on this, we have identified from hilus (10-40 mm wide - 54.8 %) and early (more than 40 m - 19.3 %) dichotomous choices. The need for this approach was dictated not only area- segmental aspect of the study, but certain neurovascular relationships.

Zonal artery directed to the appropriate department of the spleen. First of all, it was observed that their division usually occurs on the long axis of the organ - which we have marked as vertical. In rare cases, the zonal division of the arteries occurs in a plane transverse to the long axis of the spleen and marked as radial horizontal.

Concerned form of division of the splenic artery with branching zonal vessels. The predominant form of division is loose shape, although some found it less than the dividing of the

splenic artery. Often there is a dichotomous variant - each zonal artery divides into two branches II order - pole and medial segmental arteries which follows to certain parts of the organ. The nature of the division of these vessels has the feature that begins to meet more single- trunk variant forms of division (especially lower segmental vessels). The predominant remains the same dichotomous version placer form.

Multilateral version of this form by dividing zonal vessels characterized by the fact that both the artery was divided into 3-4 branches, and in the upper portions of these branches have both vertical and horizontal position and in the lower parts only vertically. Division of segmental vessels was mainly dichotomously or branches joined the spleen alone.

Backbone form of several more common in the lower zonal artery. In the majority of cases observed multilateral option - rising (2/ 3) and horizontal (1/ 3) - upper zonal artery; downward - the lower zonal branch. Division, resulting from 3-5 branches enters the organ itself, or advances dichotomously.

Single- variant this form of the zonal division of the arteries was observed in some cases (some more often than the lower branch). In this vessel penetrated into the parenchyma of the organ and shared intraorganic .

Exploring the zonal- segmental structure of the spleen in dichotomous form of dividing the splenic artery, it was observed that in the upper zone are often two segments - upper pole and upper- middle which can be formed in all forms of division of zonal artery. Similarly, in various forms of division can be formed 3 segments which are arranged in series or horizontally or radially. Sometimes placer form of division zonal artery (a few more lower branch) have monosegmental character, that portion of the spleen, supplied by blood this vessel, represented the only area, without division into parts. Thus, when a dummy variant of dividing the splenic artery in organs is most often, defined 2 areas - upper and lower segments and 4 (2 pole and 2 median) , at least - 5 segments (including 3 upper and 2 lower) or 3 segments (including 2 upper and lower 1).

At the multilateral option placer form division (8.7%) while splenic artery was divided into 3 branches (in one case, 4 branches). One of these branches was a continuation of the artery and median followed in the part authority, the other two - to the poles of the spleen. A limited number of observations does not allow to reliably detect patterns of zonal- segmental distribution of branches in this form of division - were preparates of the three zones (without division into segments) with two zones (4 segments), spleen which had structure without segments.

Backbone form of dividing the splenic artery met in 17.2% of our observations. Predominant (15.5 %) was the multilateral version of this form. In most cases (3/5) was down- trend artery - from the upper pole of the spleen to the lower. In other cases - upward. In half of all observations, regardless of the direction of the vessel, splenic artery followed along the gates of the organ and

subsequently gave three branches - the upper, middle and lower zonal artery (or the reverse). In other cases, these branches were 4 - pole, two median and one pole (the opposite pole). Each of these branches is directed to a specific part of the spleen and involved in the vascularization of it. In descending variant in the organ usually defined three zones - upper, middle and lower, each supply by blood from zonal artery, and in cases where there were 4 branches of the splenic artery, two middle vascularized one site - the middle area.

In the uplink direction of the main divisions, except structure such threezonal structure of organ observed doublezonal spleen. There were upper and lower zones, but to identify patterns of participation in the formation of different branches of one or another of them failed. Division of areas into segments by dividing the spleen artery trunk are not always expressed. Often its branches monosegmental, at least in some areas defined segments, so that the number of isolated areas in these cases is 4-5.

Single- variant of form of the splenic artery trunk met us in one preparation - the vessel was heading in the parenchyma of the organ is not sharing, forked already inside it. In this case the spleen had structure without segments.

Should choose the attention on patterns of formation of additional pole arteries are involved in blood supply and spleen were observed on most preparations (60%). Most had an extra branch to the lower pole, which began from the splenic artery is usually a one trunk with the left gastro-omental artery, only sometimes on their own. Twice was less additional branch to the top of the pole, which departed from the splenic artery, sometimes from its zonal branches. 40 % of the preparations was any one additional branch, (15.5 %) of these branches had 2-upper and lower pole or two lower poles. Only in rare cases, the branches were 3-4. Preferably, the additional pole artery encountered in placer form of division of the splenic artery. In most cases, these arteries are involved in the blood supply of the respective pole segments or zones. Twice they rarely vascularized isolated segment of the organ - in 3 cases was upper pole additional segment in 7 cases -lower pole.

Investigation of intraorganic division of splenic vessels showed that the penetrating arterial branches to the organ of II - III (sometimes IV) order is often divided in placer form - or dichotomously 3-4 branches simultaneously. The last variant, multilateral, characteristic pole vessels, less - to the median.

Almost as frequently observed dichotomous division engaging in organ arteries, thus dividing them happening or immediately after penetration into the parenchyma, or first vessel sent to a specific part of spleen and shared here.

Less frequently observed trunk shape (multilateral) dividing the input into organ branches. The last enter into the parenchyma certain direction and along the way give numerous short and long branches to the sides.

The same form - the backbone becomes dominant when divided arterial branches further orders (IV-V). Distribution of lateral branches thus there is a way that the blood supply to this area of the vessel is comparable to the cone larger or smaller, the basis of which is addressed to the capsule body. In subcapsular area branches VI-VII orders are usually have placer form division (dichotomous or oftenly multilateral).

Summarizing the material for the study area- segmental structure of human spleen, it should be noted that in most cases (80%) in the organ are determined two zones - upper and lower, much less (11%) - three zones - upper, middle and lower. Often zone with 2 segments, at least 3, in some cases they monosegmental. Some preparations (about 9%) had spleen outsegmental structure, as was the uniform distribution of arterial branches in the parenchyma.

Lots of vascularization – zones, segments separated smaller -vascular spaces which are better expressed between zones - they are wider and rectilinear. The boundaries between the segments are narrow and have a different configuration. These borders were expressed on those of certain preparations, where were vascular " intersections" – branches of one segmental (or zonal) artery involved in the formation of not only "their" section (or zone), but the other , which is located nearby. In one case, it was full of «crossing «mid- segmental vessels. Directly with the zonal- segmental structure of the spleen is the question of arterial anastomoses between these areas as well as between the spleen and other organs of the abdominal cavity. First - intersystem anastomoses are found both outside and inside the body. Compounds outside of organs occurred in 12.2 % of cases - they were either anastomoses between zonal vessels (in one case between segmental branches) or thin connecting branches between zonal or segmental arteries. Expressed intraorganic connection we met in 14 % of cases. They were the branches between vessels IV, III orders sometimes how zonal as segmental arteries. These anastomoses were individual on preparations. If you compare the size of the segments or zones and caliber of anastomoses, which connected them, it is difficult to assume that by such vessels could be restored blood flow is one of the areas in conditions of "off" flow. Inside the organ we met other arterial anastomoses.

They are usually located within the zone or segment and connected the terminal branches (VI - VII order) together in subcapsular parts. Above all, these compounds were developed by outsegmental structure of the spleen. Note that severity of anastomosis has little effect on area-segmental structure of the organ. Cases of structure of the spleen without segments associated with diffuse and uniform distribution intraorganic vascular anastomoses between them cannot be.

Conclusions: As a result of complex makromikroskopik study found that the main source of blood supply of the spleen is the splenic artery. The main forms of branching blood vessels of the spleen is loose and trunk. The first is dichotomous and multilateral variants, the second - single- and multilateral. Splenic artery and its branches outside the organ I-II order (zonal and segmental) and intraorganic branches III-IV orders loose peculiar form of division , branches of the V-VI order - main form vessels VI-VII orders - loose form branching .