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Anatomical characteristics of the left suprarenal vein (V. suprarenalis sinistra)

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ABSTRACT

Our study was performed on 82 cases, using as study methods the dissection and the plastic injection (Technovit 7143) followed by NaOH corrosion. The suprarenal vein traject was always straight, presenting two aspects: in 54.55 % of cases it was an oblique infero-medial traject and in 45.45 % of cases it was a vertical traject. The traject of the left gonadal vein was oblique supero-medial in 55.56 % of the cases and in 44.44 % of cases was vertical. Unlike the corresponding suprarenal vein, the left gonadal vein showed, in 19.44 % of cases, a sinuous traject. Regarding the left suprarenal vein termination site, we found that in 24 cases (50 % of cases), the suprarenal vein was lateral to the aorta, in 41.67 % of cases being closer to the aorta and 8.33 % of cases halfway aorta-left kidney. In the other 24 cases, the left suprarenal vein ends into the left renal vein in front of the aorta, in 25 % of cases on the anterolateral face of the aorta and in 33.33 % of cases closer to the midline; in one case this termination was right beyond the middle of the anterior face of the aorta. The termination of the left gonadal vein was assessed in 75 % of cases on the aortic side, in 37.5 % of cases being closer to the aorta and also in 37.5% of all cases being halfway aorta-left kidney. In 25% of the cases the left gonadal vein ended in into the renal vein on its anterolateral aspect. Comparing the renal termination of the suprarenal and gonadal veins we found that in 29.27 % of cases they ended at the same level, but in

only 7.32 % of cases both veins had a vertical traject. In 60.97 % of the cases the gonadal vein ends lateral to the suprarenal vein and only in 9.76 % of the cases the gonadal vein ends medial to the suprarenal vein. We did not found the termination of the suprarenal and gonadal veins closer to kidney or the left gonadal vein end on the anterior face of the aorta.

Keywords: suprarenal vein-morphology

Introduction

For Testut [1] the suprarenal veins are superior, by their diameter, to the corresponding arteries, coming from the surface of the suprarenal area where they have their groves and ends on the sides of the inferior vena cava, above the renal veins. Also Testut [2] speaks of a left capsulo diaphragmatic vein formed by the confluence, more or less close to the upper margin of the left renal vein, of the: 1. left capsular (suprarenal) vein, oblique descending, anterior to the hilum of the left gland and 2. left diaphragmatic vein which, from the diaphragm, descends along the medial border of the left suprarenal gland, from which it receives a number of small tributaries. The capsulo-diaphragmatic vein maintains the gland in a low position and on the superior margin of the internal border of the left kidney.

According to Rouvière [3] the renal veins receive the inferior suprarenal vein, almost always the left spermatic or ovarian vein and the middle

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suprarenal vein on the same side.

According to Kamina [4] the venous plexus of the medullar part is drained out by the central vein that exits the hilum to become the suprarenal vein. The left suprarenal vein ends in the left renal vein on its upper margin. The left main suprarenal vein is anastomosed to the left inferior phrenic vein, providing a significant bypass path, reno-suprarenophrenic.

According to Gray [5], the medullary veins emerge through the hilum by a single vein. The left suprarenal vein descends medially, anterior and lateral to the left celiac ganglion, passes posterior to the pancreatic body and ends in the left renal vein.

Sénécaïl [6] states that the suprarenal venous return is secured primarily by a drainage vein called main or middle or central suprarenal vein that exits through a groove on the anterior face, improperly called the hilum and ends into the renal vein on the left and directly into the inferior vena cava on the right.

Juskiewenski [7] says that the renal vein receives, at its upper margin, almost in contact with the aorta, the main suprarenal vein.

Terminologia Anatomica [8] mentions only one left suprarenal vein that drains into the left renal vein.

Material and methods

Our study was performed on 82 cases of fresh and formalin preserved kidneys, eviscerated or within the cadavers and organic blocks (both kidneys harvested together with the abdominal aorta and inferior vena cava). We used the methods of dissection and the plastic injection (Technovit 7143) followed by NaOH corrosion. We followed: the traject and the termination of the suprarenal veins compared with the aorta and the left gonadal vein, the angle that it forms at termination with the gonadal vein, assessing also the morphometry of the arteries. Each landmark was studied on a characteristic number of cases.

Results

The suprarenal vein traject was followed on a number of 44 cases, finding that the suprarenal vein is always straight trajectory, presenting two types: in 24 cases (54.55% of cases) showed an oblique infero-medial traject and in 20 cases (45.45% of cases) the traject of the venous trunk was vertical. The left gonadal vein traject was followed on a number of 36 cases; we found it in 20 cases (55.56% of cases) oblique supero-medial and in 16 cases (44.44% of cases) it was vertical. Unlike the corresponding suprarenal vein, the left gonadal vein showed, in 7 cases (19.44% of cases), a sinuous traject.

Figure 1 – Suprarenal vein draining perpendicular to the renal vein on the anterolateral face of the aorta.

The termination of the left suprarenal vein was evaluated on a number of 48 cases; we found that in 24 cases (50 % of cases) the termination of the suprarenal vein into the left renal vein was made lateral to the aorta, in 20 cases (41.67 % of cases) is closer to the aorta and in 4 cases (8.33 % of all cases) halfway aorta-left kidney. In the other 24 cases, the left suprarenal vein ends into the left renal vein in front of the aorta, in 8 cases (25% of cases) on the

anterolateral aspect of the aorta and in 16 cases (33.33 % of cases) on the front face of the aorta, close to the midline; in one case (2.78 % of all cases) it ended to the right of the middle of the aorta.

Figure 2 - Suprarenal vein with oblique infero-medial trajectory that ends into the renal vein on the anterior face of the aorta and left gonadal vein, slightly oblique supero-medial that ends into the renal vein on the anterolateral face of the aorta.

Figure 3 - Suprarenal vein, slightly oblique infero-laterally, terminating on the postero-superior face of the renal vein; left gonadal vein, oblique supero-medially, ending into the renal vein same level with the suprarenal vein; between the two veins is formed an obtuse angle opened laterally.

The termination of the left gonadal vein was followed on 32 cases, finding that in 24 cases (75 %

of cases) ends lateral of the aorta, in 12 cases (37.5 % of cases) being closer to the aorta and also in 12 cases (37.5 % of cases) is halfway aorta-left kidney. In 8 cases (25% of cases) the left gonadal vein ends in the renal vein on its anterolateral face.

Figure 4 - Left gonadal vein, smaller than the suprarenal vein, oriented supero-medially and ending into the renal vein laterally to the suprarenal vein, which ends on the antero-lateral face of the aorta

Comparing the termination into the left renal of the suprarenal and gonadal veins (on a total of 41 cases), we found that in 12 cases (29.27% of cases) they ended the same level but only in 3 cases both veins had a vertical trajectory (7.32% of cases). In 25 cases (60.97% of cases) the gonadal vein ends lateral to the suprarenal and in only 4 cases (9.76% of cases) the gonadal vein ends medial to the suprarenal vein, with a single case in which the gonadal vein ended on the anterolateral aspect of the aorta.

The length of the suprarenal was between 1 to 6 cm and its caliber is uniform, with 0.2-0.8 cm, similar to the caliber of the left gonadal vein.

Discussions

The literature we consulted offers little information on the morphology of the suprarenal vein. In all studied cases, the suprarenal vein ends only into the venous trunk of the renal vein, so after the confluence of its tributaries; we did not found any case in which the suprarenal vein terminates in one of the branches of origin of the renal vein. According to [9], when a single retroaortic vein is present, the suprarenal vein ends either into the prehilar portion of the renal vein or directly into the caudal vein.

For most authors [1,2,4,7] the suprarenal vein terminates at the upper margin of the renal vein, an aspect found by us; in only 3 cases (6.25% of cases) the suprarenal vein ends on the posterior superior face of the renal vein. The termination of the suprarenal vein into the renal vein, according to [7] is almost in contact with the aorta, while we found that in a similar percentage (50% of cases) the suprarenal vein ends lateral to the aorta or anterior to it, closer to the aorta in 41.67% of the cases. We did not found the termination of the suprarenal and left gonadal veins into the renal vein closer to the kidney or the termination of the left gonadal vein on the front of the aorta (only anterior-lateral).

According to [1,2,4,10,11,12], the suprarenal vein receives the left phrenic vein near the upper margin of the renal vein; Testut named the right suprarenal vein as capsulo-diaphragmatic vein, something we do not we met.

The inferior suprarenal vein may end into the corresponding renal vein in approximately equal proportions, either perpendicular or nearly perpendicular to the renal vein or oblique infero-medial; the obliquity is higher for left inferior suprarenal veins in relation to the right ones.

Between the terminations of the suprarenal and gonadal veins appears, most often, an obtuse angle opened laterally.

Unlike the arteries, which may be under 1 cm (0.2-1 cm), the inferior suprarenal vein showed a length between 1-6 cm, [13] finding a length between 0.5-5 cm, with an average of 2.83 cm.

The caliber of the inferior suprarenal vein is uniform; we found it between 0.2 to 0.8 cm while [13] found it between 0.2-0.9 cm, so similar values.

If for the inferior suprarenal artery we can speak of a suprarenal pedicle, for the inferior suprarenal vein we never met this aspect; always the inferior suprarenal vein was unique.

Conclusions

The presence of a single main venous trunk explains the common use of the radiological opacification by suprarenal phlebography more than by arteriography, which impose the selective catheterization of three pedicles [6].

Regarding the renal vein tributaries, we encountered the same left-right asymmetry on the inferior suprarenal vein obliquity and the asymmetry of its ending manner and location into the corresponding renal vein.

Contrary to classical anatomy, which states that in most cases the inferior suprarenal vein ends into the renal vein above the termination of the left gonadal vein, we met this only in a very small percentage; most commonly the left gonadal vein ended into the renal vein lateral to the suprajacent suprarenal vein [10,11]. Also interesting are the situations when the left gonadal vein is satellite to a left gonadal artery originating from the renal artery, single or accessory, an aspect less cited in the literature [1,2,13,14].

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