

Accessory tributary of the left renal vein - a case report

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ABSTRACT

The left renal vein drains the left kidney to the left lateral inferior vena cava, and it courses anteriorly to the abdominal aorta and posteriorly to the superior mesenteric artery.

The case of two renal veins drain the kidneys was seen during a routine dissection of the left retroperitoneal space of a 36-year-old male cadaver.

This unusual complex pattern of the left renal vein with an accessory tributary is useful, particularly for surgeons and urologists needing to access the retroperitoneal space. An awareness of such renal vascular variation can help reduce the risk of iatrogenic vascular injury when accessing this area.

Keywords: Accessory Tributary, Renal Vein, Variation

INTRODUCTION

Two renal veins drain the kidneys. The right renal vein is a short vessel (2.5cm) and does not receive any tributary [1]. The left renal vein drains the left kidney to the left lateral inferior vena cava, and it courses anteriorly to the abdominal aorta and posteriorly to the superior mesenteric artery at the meso-aortic angle [2,3]. The Left renal has a length of 7.5 cm and is three times longer than the right [1]. The disposition of the left renal vein in the meso-aortic angle may lead to left renal vein compression and entrapment (Nutcracker Syndrome) [4]. The length of the left renal vein compared with the contralateral right makes the left kidney the best choice for live donor nephrectomy [2]. The left renal vein typically has two tributaries, the left suprarenal and the left gonadal, respectively. Therefore, these two tributaries are usually described as the

traditional superior and inferior tributaries of the left renal vein, respectively [5]. Researchers have previously reported different variations of the renal vein, but an accessory tributary of the left renal vein is rare. These renal vessel variations may occur in the origin, course, and termination of the vessel [6], and may be due to the errors of embryological development frequently observed during renal formation [7]. The most common renal vein variations frequently observed are the circum-aortic and retro-aortic left renal veins, Supernumerary renal veins, and Plexiform left renal veins [1]. These variations drain the kidney to the inferior vena cava and have been reported. However, the variation reported in this paper is a rare occurrence.

CASE PRESENTATION

The case was seen during a routine dissection

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of the left retroperitoneal space of a 36-year-old male cadaver at the human anatomy laboratory of the University of Rwanda.

- 1 superior mesenteric artery
- 2 Left renal vein
- 3 Inferior vena cava
- 4 Abdominal aorta
- 5 Left suprarenal vein
- 6 Accessory tributary of left renal vein
- 7 Left ureter
- 8 Left testicular vein



Figure 1: Left renal vein with its tributaries in retroperitoneal space

1. Left suprarenal gland
2. Left suprarenal vein
3. left renal vein
4. left anterior segmental renal vein
5. Left middle segmental renal vein
6. Accessory tributary of left renal vein
7. Left ureter
8. Left testicular vein
9. transverse fascia of left antero lateral abdominal wall

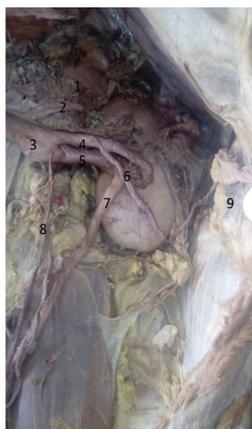


Figure 2: Left renal vein's tributaries

1. Left renal vein
2. Left renal artery
3. Anterior segmental vein
4. Middle segmental vein
5. Posterior segmental vein
6. Capsular branches of segmental vein
7. Accessory tributary of left renal vein



Figure 3: The hilum of the left kidney anterior tributary vein is retracted inferiorly

The researchers observed an unusual complex pattern of the left renal vein. The left renal vein goes anterior to the abdominal aorta and receives its first tributary (suprarenal vein) and second tributary (left testicular vein) before continuing to the hilum of the left kidney, which was mal-rotated and anteriorly positioned. Before getting to the hilum of the mal-rotated left kidney, the left renal vein receives a third tributary. This makes three main tributaries that drained the left kidney, which were described as superior, inferior, and anterior (Figure 1 and Figure 3). Subsequently, one of three veins that drains the hilum anteriorly received an accessory tributary vein, which drained the left lateral abdominal wall (Figure 2).

DISCUSSION

The development of the renal veins is a complex process with many possible alternative patterns of formation. The complex starts by forming the renal collar which consists of dorsal branch (intersupracardinal anastomosis) and a ventral branch (intercardinal anastomosis) [8]. This two branches drain the embryonic kidney. The formation of this renal collar branches followed by the regression of the posterior branch. The right-sided anterior branch gets incorporated into the IVC wall and on the left side forms the left renal vein. This complex formation is particularly applied on the left side because of the communication of the left renal vein with the adrenal, gonadal, phrenic, and hemiazygos veins [1]. The configuration patterns of the renal vein tributaries were classified based on a study by Bhanu et al in 2017[6]. Type I -one upper and one lower tributary, Type II- more than two tributaries, for example, upper, middle, and lower. Type III- any of the above classifications plus another additional vein[6]. Our case is quite similar to the type III classification but with little difference because, in our case, the accessory vein drained the lateral abdominal wall into the left renal vein rather than into the inferior vena cava.

CONCLUSION

This case is useful, particularly to surgeons and urologists who need to access the retroperitoneal space. An awareness of such renal vascular variation can help reduce the risk of iatrogenic vascular injury when accessing this area.

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