

Retroaortic Left Renal Vein – A Case Report

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Abstract

Retroaortic left renal vein is the consequence of persistence of the dorsal arch of the renal collar. The estimated occurrence of retroaortic left renal vein is 0.5 to 6.8%. Cross-sectional computerized tomography study was done in the present case and the left renal vein was observed posterior to the abdominal aorta. Venous anomalies of the renal veins are clinically important particularly in retroperitoneal surgeries and renal transplantations. These anomalies should not be misdiagnosed for other pathological causes

Key words: renal vein; variation; retroaortic.

Introduction:

Renal veins lie anterior to the renal arteries and open into the inferior vena cava almost at right angles. The left renal vein is three times longer than the right and for this reason; the left kidney is the preferred side for live donor nephrectomy. The left renal vein runs from its origin in the renal hilum, posterior to the splenic vein and the body of pancreas, and then across the anterior aspect of the aorta, just below the origin of the superior mesenteric artery. The left gonadal vein and the left suprarenal vein drains into the left renal vein nearer to the midline before left renal vein drains into the inferior venacava. The left renal vein enters the inferior vena cava a little superior to the right.

Any small deviations from the normal embryological development of the renal veins may result in the variations in the origin, course & termination of renal veins. Variations of renal veins can result in unusual symptoms, based on the type, extent and its course. The left renal vein may be double, one vein passing posterior, the other anterior, to the aorta before joining the inferior vena cava. This is sometimes referred to as persistence of the 'renal collar'. The anterior vein may be absent so that there is a single retroaortic left renal vein. These variations have many clinical complications (1).

Retroaortic left renal veins can be compressed between the aorta and the vertebra, referred to as the 'posterior nutcracker phenomenon'. The compression can elevate pressure within the left renal vein, leading to hematuria, and resultant congestion of the left kidney (2-5), varicocele formation and ureteropelvic junction obstruction (6). Congenital renal vascular variations can cause renal vascular congestion, which clinically manifests as hematuria, left flank pain and pelvic congestion (7-12). Retroaortic presentation of the left renal vein is often asymptomatic, but is of particular relevance before, during and after renal surgeries. Breakthrough in imagining technologies, such as computed tomography and magnetic resonance imagining, have confirmed timely identification of such variations, thereby preventing intraoperative hemorrhage (13,14).

Case Report:

A 51-year-old male came for staging CT to assess the progression of appendicele carcinoma for which he had appendectomy presented to Sangre Grande hospital.

Past History: Patient initially presented two years ago with history of right lower quadrant pain to private hospital in Trinidad. Patient had a CT scan as part of investigation to rule out appendicitis. The CT showed cystic appendix mass. Preliminary diagnosis was mucocele of appendix. Patient underwent surgery and the diagnosis was carcinoma of appendix. Present CT findings: Incidentally there was retroaortic left renal vein (Fig. 1)

Discussion:

A thorough anatomical knowledge about the variation patterns of renal veins is obligatory for retroperitoneal surgeries, venographic and radiological procedures. The development of the renal veins starts from 4th week of intra uterine life and continues up to 8th week, which is a part of the intricate developmental process of inferior vena cava (IVC). Regression and persistence of posterior cardinal veins, subcardinal and supracardinal veins forms the IVC. The renal vein is formed from the persistence of the anastomosis of the

subcardinal and supracardinal veins. In the course of the development of the IVC, the anastomotic communications between the subcardinal and supracardinal channels forms the collar of veins, which encircles the developing aorta. The ventral portion of the circum-aortic collar persists as the normal left renal vein. If the dorsal portion of this collar persists, then the left renal vein is posterior to the aorta, forming a retro-aortic left renal vein. (15,16).

Two types of retro-aortic renal vein development has been is documented. The Type I develops from the persistence of the left supracardinal anastomosis, the intersupracardinal anastomosis, and the dorsal left left renal vein, with degeneration of the ventral renal vein. Type II is formed by the persistence of the left sub-supracardinal anastomosis and the left supracardinal vein (17). In a CT study conducted by Reed et al on 433 cases had found that retro-aortic left renal vein and circum-aortic left renal vein anomaly in 1.8% and 4.4% respectively (18).

Trigaux et al. (19), studied 1014 CT cases and found that retro-aortic left renal vein and circum-aortic left renal vein anomaly in 3.7% and 6.8% respectively⁸. Studies conducted by Satyapal et al. (20), on 1008 kidneys showed that the retro-aortic left renal vein and circum-aortic left renal vein anomaly in only 0.5% and 0.3% respectively⁹. Arslan et al. (21) reported that the incidence rates of the retro aortic left renal vein were 1.7% and 1.6% in men and women, respectively, by evaluating 1125 consecutive abdominal computed tomographic scans. Varicocele was found in 7 (77%) of 9 patients by scrotal color doppler ultrasonography. They suggested that the retro aortic left renal vein could be one of the possible etiologies for varicocele development. The left renal vein is preferred over the right in renal transplantation because of its longer length. It is important for the surgeons to know the developmental anomalies of the left renal vein whether it is pre-aortic or not and variation the course of the renal veins to avoid unexpected hemorrhage and fatal complications during retroperitoneal surgeries.

Conclusion:

A comprehensive knowledge about major congenital anomalies of the renal veins is essential for surgeon and radiologist to make distinctive diagnosis during retroperitoneal surgeries and renal transplant transplantation.

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FIG: 1

