



Duplication of Right Ovarian Vein

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Authors' contributions

This work was carried out in collaboration between all authors. Author SR designed the study, performed the statistical analysis wrote the protocol and the first draft of the manuscript. Author SK and TRR managed the analyses of the study and the literature searches. All authors read and approved the final manuscript.

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Case Study

ABSTRACT

We encountered a rare case of an anatomic variant of duplication of right ovarian vein in a 33 year old patient. Anatomic variant of the ovarian veins are extremely rare. However, with the increasing use of sophisticated diagnostic technology like computed tomography and magnetic resonance imaging these anatomical variant are more frequently diagnosed. The majority of venous anomalies are asymptomatic, however these variations can cause abnormal drainage, which could lead to clinical symptoms associated with the dysfunction of the vascular systems. Undiagnosed venous anomalies may lead to major complications during abdominal surgeries. Here we describe the detailed anatomical features of the area and discuss the related anatomical and developmental aspects.

Keywords: Gonadal veins; ovarian veins; venous anomalies.

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1. INTRODUCTION

The gonadal veins are anatomically asymmetric and there are several anatomical variations involving them. Normally the right ovarian vein arises from the right ovarian plexus, which is continuous with the uterine plexus and lies lateral to the right ureter. It ascends anterior to psoas major muscle and with parallel to the right ureter. It crosses the ureter anteromedially halfway between bifurcation of the inferior vena cava (IVC) and the point in which it joins the anterolateral IVC. The left ovarian vein ascends similarly into the abdomen but drains into the left renal vein [1-4].

The ovarian veins are frequently used to identify the ovaries; They are useful landmarks particularly for determining the origin of a pelvic mass. The ovarian vascular pedicle sign is present in 92% of ovarian masses; direct joining of an asymmetrically enlarged gonadal veins with a pelvic mass indicates that the ovary is the organ of origin. The ovarian vein is best visualized at level of the origin of the inferior mesenteric artery where it is surrounded by retroperitoneal fat and in the pelvis medial to external iliac vessels [2,5].

Variation in gonadal veins remains unnoticed clinically, but these variations are incidental findings during autopsy, radiological procedures and surgeries. The presence of such variations can increase risk of varicocele and infertility in patients.

2. CASE REPORT

In present case, a variation in draining pattern of right ovarian vein was observed during a routine abdominal computerized tomography (CT) was done at Radiology Department of Southern Medical Centre at Sanfernado. A 33 year old presented to the gynaecological clinic with history of long standing menorrhagia and pelvic pain. Patient was referred for ultrasound by the consultant. Pelvic ultrasound was performed which showed intra-uterine contraceptive device (IUCD) in situ and dilated pelvic veins. For further evaluation CT was recommended. CT scan showed dilated and tortuous gonadal veins on both sides measuring 7mm on right and 8 mm length on left. Incidentally, the right gonadal vein in its middle of the course showed duplication and this duplication is noticed at the level of S1 vertebra and continued up to L3 vertebra were it again reunited to form a single vein before

draining into the IVC (Fig. 1). According to the literature review this type of case was rarely reported. There was no other vascular abnormality in this case.

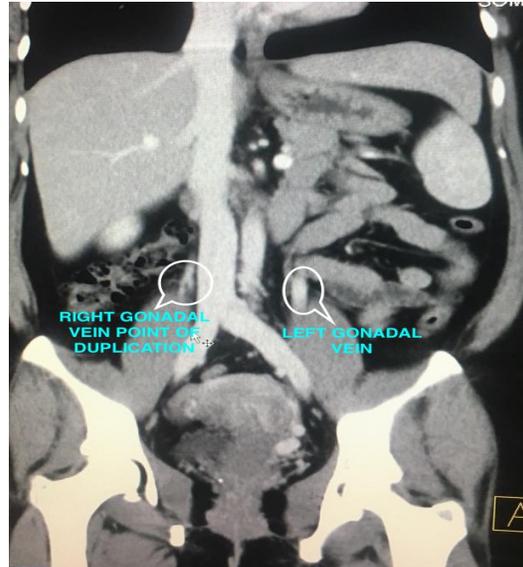


Fig. 1A

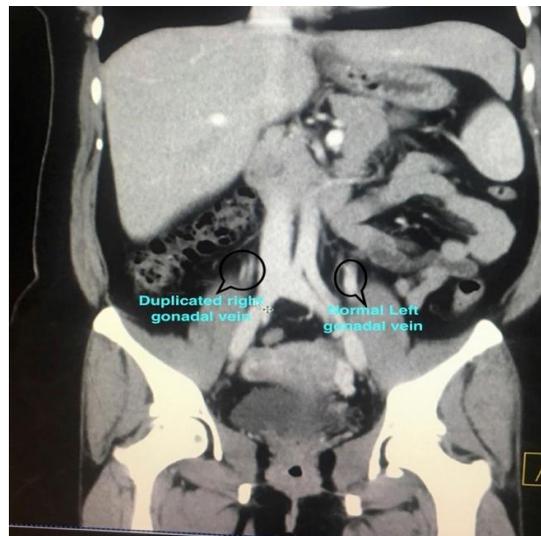


Fig. 1B

3. DISCUSSION

The development, regression, anastomosis and replacement of posterior cardinal, sub-cardinal and supra-cardinal veins are involved in the development of gonadal, renal and inferior vena cava. Variations in the drainage of gonadal vein are due to abnormal embryological development

in anastomotic channel of post-cardinal, supra-cardinal and sub cardinal veins [6]. Gonadal vein develops from caudal part of sub-cardinal vein and it drains into the supra cardinal and sub cardinal anastomosis. In the right side, this supra cardinal and sub cardinal anastomosis and also a small portion of sub-cardinal vein are incorporated into the formation of IVC, so right gonadal vein usually drains into the IVC. In the left side, this supra-sub cardinal anastomosis forms part of left renal vein where the left gonadal vein drains [7]. Anastomosis between the supra-cardinal and the sub-cardinal veins, which occur bilaterally, form the renal segment of IVC [8].

Several reports on variations of gonadal veins have been documented. Gay et al., reported that 40% of patients present multiple gonadal veins [9]. Variations of number of left side gonadal vein and their mode of termination are frequent with male dominance [10,11]. Asala et al., found that 21.3% of cadavers had variations of gonadal veins, and in 18.8% of cases, variations were bilaterally present. It was also noted that variations were more common on left side [12]. Studies on gonadal veins draining into left renal vein have also been reported [13]. Studies conducted by Diwan et al., showed multiple variations of the left testicular veins, like medial and lateral testicular veins on left side, the left medial testicular vein was double the width of the left lateral testicular vein [14]. In another case, left testicular vein divided into 2 trunks, medial and lateral. Lateral trunk drained into ipsilateral renal vein, and medial one into inferior vena cava [15]. Nikolay Hr. Kyuchukov noted 3 divisions of right testicular veins—lateral, middle and medial. The right lateral testicular vein drained to right renal vein. The combined middle and medial testicular veins drained at an angle between inferior vena cava and right renal vein. The left testicular vein was duplicated and was composed of medial and lateral venous trunks which drained into regions of left renal vein [16]. Studies on double gonadal veins and left sided predominance of duplication of gonadal veins have also been reported [17-19]. Reports on right testicular vein draining into the right renal vein instead of inferior vena cava and duplication of gonadal veins on both sides and were draining into inferior vena cava have also been documented [20].

During surgical procedures variation of gonadal vessels becomes important. As per literature and available data left gonadal vein develops from

lower part of left sub cardinal vein. The bifurcation of the left sub cardinal vein, during its development leads to the bifurcation of the left gonadal vein as in present case. During retroperitoneal surgeries or radiological assessment this variation must be kept in mind. Variation noticed above have to be considered during surgical procedures. These variations of gonadal veins can increase the risk of possible varicocele and infertility in patients [21].

4. CONCLUSIONS

Variation in gonadal vein observed in the above case may remain asymptomatic and unnoticed, but these variations are of the practical importance in renal and gonadal surgeries and other therapeutic and diagnostic procedures. Incidental findings of these type of variations during autopsy, radiological procedures and surgeries have to keep in mind during routine surgical and radiological procedures of the abdomen. In-depth knowledge of these developmental variant of gonadal veins will always be of practical use in preventing further surgical complications.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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