LETTER TO THE EDITOR

Management of infrarenal duplicated inferior vena cava during living related kidney transplantation

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Congenital anomalies of the inferior vena cava (IVC) are relatively rare pathologies, usually with an asymptomatic course.

During open donor nephrectomy, we incidentally found two left infrarenal duplicated IVCs (Fig. 1):

In the first case, left infrarenal IVC was sacrificed. Left kidney was harvested with a normal length renal vein (Fig. 2a). The recipient had uneventful post-op course. Only mild edema was seen in his donor, around pelvis girdle and proximal left thigh, persisting for 2 weeks.

In second donor, we divided left renal vein more proximally with an acceptable short renal vein to preserve the continuity of left IVC (Fig. 2b). Both donor and recipient had good renal function and no surgical complication on follow-ups was seen.

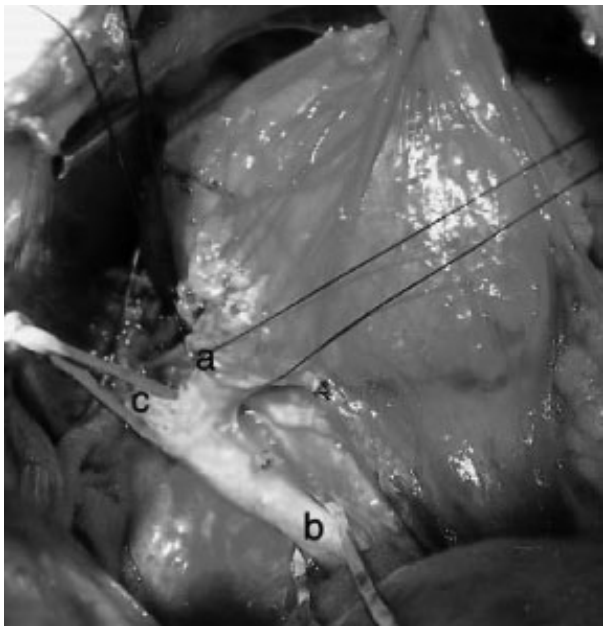

Figure 1 Operative finding of infrarenal duplicated double inferior vena cava (IVC). (a) Proximal left renal vein. (b) Left infrarenal duplicated IVC. (c) Distal left renal vein draining to IVC.

Discussion

Congenital anomalies of IVC are usually diagnosed by chance during surgery. From bioptic material their incidence has been estimated to be 2–3% [1]. The frequency of accidental intraoperative finding in different series varies between 0.2% and 0.6%. Caval duplication and a left positioned vena cava are the most common incidental anomalies [2]. They are known to be associated with various urogenital tract anomalies such as horseshoe kidneys and circum-aortic renal collar [3,4].

Nowadays, in many transplant centers, helical CT angiography and MR angiography have replaced conventional angiography. They give a better view of the renal parenchyma and the computer reconstruction shows the arterial anatomy as well. Ureteric and renal anomalies are also seen well with these methods; the accuracy is 95% and they are quicker and cheaper [5].

Up to now, few cases with complete duplication of IVC have been reported to be found during live donor nephrectomy (LDN) [6,7]. In previous literature, only one case with infrarenal duplicated IVC was found that was managed as the first case in this report [8]. They did not mention any complication in post-op course. However, as we mentioned earlier, due to ligation of left IVC, our first case suffered from edema. In complete duplicated IVC, usually each kidney drains to the ipsilateral IVC and nephrectomy has no effect on limb drainage. However, infrarenal duplicated IVC is totally different, as ipsilateral limb drains partially or totally to renal vein and ligation of this vein compromises drainage of limb, at least early in post-op. So, it seems reasonable to take the second surgical technique.

We advise to perform imaging technique in LDN. If the donor has duplicated IVC, it is essential to carefully conduct advance imaging techniques to investigate other possible anomalies and blood flow of the renal vein. Although it is preferred to use kidney with longer renal vein, the graft must be carefully selected so it is not disadvantageous to the donor.

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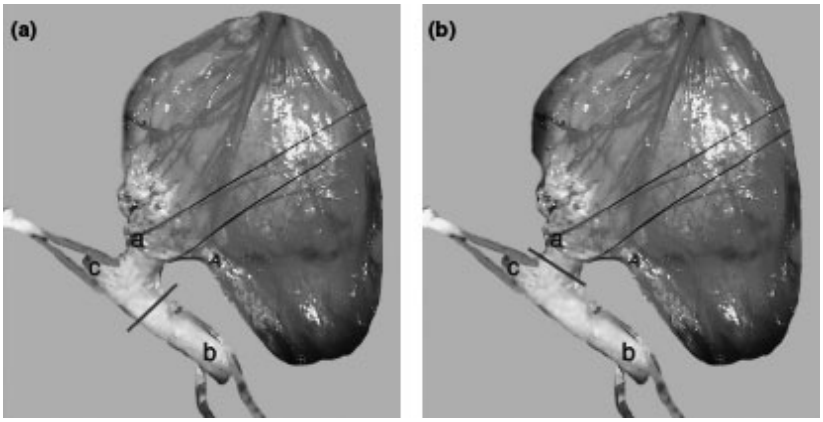

Figure 2 Comparison of surgical technique in the first and second cases. (2a) Left infrarenal duplicated inferior vena cava (IVC) was severed distally, with preservation of normal length of left renal vein. (2b) Left renal vein was severed proximally and continuity of left infrarenal duplicated IVC was preserved. (a) Proximal left renal vein. (b) Left infrarenal duplicated IVC. (c) Distal left renal vein draining to IVC.

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References

1. Palit S, Deb S. A rare presentation of double inferior vena cava with anomalous pattern of azygos and hemiazygos venous systems: a case report. *J Anat Soc India* 2002; **51**: 65.
2. Cossu ML, Ruggiu M, Fais E, Sparta C, Dettori G, Noya G. Congenital anomalies of the inferior vena cava. *Minerva Chir* 2000; **55**: 703.
3. Royal SA, Callen PW. CT evaluation of anomalies of the inferior vena cava and left renal vein. *AJR Am J Roentgenol* 1979; **132**: 759.
4. Smith TR, Frost A. Anomalous inferior vena cava associated with horseshoe kidneys. *Clin Imaging* 1996; **20**: 276.
5. Manikandan R, Sundaram CP. Laparoscopic live-donor nephrectomy. *BJU Int* 2006; **97**: 1154.
6. Fronek JP, Morsy MA, Singh U, Chemla E, Chang RW. Retroperitoneoscopic live donor nephrectomy in a patient with a double inferior vena cava. *J Laparoendosc Adv Surg Tech A* 2006; **16**: 378.
7. Nakatani T, Kim T, Naganuma T, Uchida J, Takemoto Y, Sugimura K. Kidney transplants from living related donors having double inferior vena cava. *Urol Int* 2004; **72**: 358.
8. Wu CT, Chiang YJ, Liu KL, Chu SH. Laparoscopic live donor nephrectomy in a patient with duplex inferior vena cava. *Transplant Proc* 2004; **36**: 1912.

