EDITORIAL

Renal grafting and the short right renal vein technical inconveniences∗

Injerto renal y los inconvenientes técnicos debidos a la cortedad de la vena renal derecha

That the right renal vein is shorter than the left is an incontestable anatomical fact. The distance from ostium to renal sinus in the right side is about 3 cm, whereas the left renal vein has a length close to 5 cm. Certainly, right renal vein is shorter than the left, but it has less anatomical complexity because not only gonadal vein flows into the left but also, occasionally, any posterior collateral vein can be found communicating with the azygos vein. It is also important to note that right venous abnormalities are more common than left ones.

Often, the medical literature refers to the disadvantages due to the shortness of the right renal vein, mainly related to the difficulty of anastomosis with the common or external iliac vein. Accordingly, numerous experts responsible for living-donor kidney transplant programs systematically opt for left nephrectomy. Others, in cadaveric kidney transplantation programs, rely on elongation of the right renal vein by diverse methods. The work of Arango et al.,1 in an excellent review of the literature, summarizes accurately the fundamental data in this debate: anatomy and length of the renal veins and various techniques for lengthening the right renal vein. According to personal and other authors’ criteria, such arguments justify the related initiatives for lengthening the right renal vein.

The limitations imposed by the shortness of the right renal vein have become more relevant with the advent and disclosure of laparoscopic nephrectomy. These are exactly the programs where left kidney is mostly chosen for grafting. In absence of structural alterations or any other pathologies that compel to choose the kidney with lower future risk for the donor, these are the only surgical reasons for choosing between left or right kidney.

Reviewing our series of living donor kidney transplants,2 it is striking that right kidney has been chosen in our practice by over 75%. Ergo, the shortness of the right renal vein has never been considered by us as a technical limitation. Therefore, it is necessary to explain our behavior seemingly contrary to most experts in renal grafts. These are our reasons:

Firstly, the length of right renal vein obtained with our surgical procedure is enough not to hamper, in any way, the anastomoses to the recipient’s veins. To achieve this, a sufficient portion of vena cava to place a Satinsky are traditionally exposed during donor nephrectomy. This maneuver allows dissecting the renal vein at the level of ostium. The maneuver to expose the vena cava in mini-incision open nephrectomy is extremely simple and has no additional risks to the donor. Of course, it is not possible to make a ligature. On the contrary, the edges of the vena cava are approximated with the Satinsky clamp and then sutured. Although, indeed suture involves more time than a simple ligature, it has the benefit to provide greater length of the right renal vein.

Secondly, grafting placement makes easier the anastomosis of the right renal vein. According to our experience, almost always the anastomosis of the renal vein has been performed in the lower portion of the vena cava. The placement of the Satinsky clamp, bottom-up, does not require releasing too much space. This allows excellent exposure of the chosen area for anastomosis of the vena cava and also, while the anastomosis is performed, this space can be moved to both sides in the anterior and posterior planes. This surgical option was adopted by Gil Vernet in the 1960s as an alternative to Murray’s4 model validated by Kuss; in our experience it is due to the numerous kidney grafts performed in dogs, whose iliac veins are very thin, for our


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doctoral thesis. In these circumstances, the increased incidence of lymphocele development is circumvented with minimal release and mobilization of the distal cava. The kidney is placed higher, in more comfortable position and hemodynamically less compromised.

Finally and thirdly, after choosing the common iliac vein for the anastomosis and according to our experience, releasing the iliac common vein from its deep and hypogastric collaterals, usually 2, is mandatory; therefore, iliac vein could be externalized. So, common iliac vein is directed toward the renal vein, instead of being renal vein directed toward the common iliac vein located at the bottom of the iliac fossa, fixed and immovable by its hypogastric bonds.

Our technical strategy for acting on donor right renal vein and the subsequent anastomosis in the recipient justifies the fact that we have never used the argument of the shortness of right renal vein as a factor for limiting organ donation. However, it is necessary to answer the question: why other surgeons find so difficult the surgery of right renal vein?

According to the literature and the careful observation of numerous surgical procedures, both open and laparoscopic, the reasons seem to be the following: on the one hand, clamp is placed on the trunk of the renal vein, not so close to the ostium as when placing a Satinsky clamp. Furthermore, vein cut off after ligation is performed distal to the foot print of the clamp, so that renal vein stump may be larger than 1 cm. Indeed in this circumstance the remaining renal vein is very short. Furthermore, if the receiver veins are not properly mobilized, the anastomosis between the short vein and common iliac vein, the location most commonly chosen by the surgeon, is technically laborious and complex: the kidney must be placed in the iliac fossa, hampering in excess the vision of the surgical field, what increases even more the difficulties during the anastomosis, generates tensions on the suture and forces to place the kidney in awkward positions.

In laparoscopic surgery, the right renal vein is even shorter. The great fear of the laparoscopic surgeon is that the hem-o-lok clips (ligature substitute before cut off) may slip causing immediate or delayed hemorrhage. This ligature requires a much larger safety margin than the traditional one used in open surgery. Of course, in these circumstances we fully understand that right kidney has been systematically delayed in many series of live-donor kidney grafts. Recent technical advances in laparoscopic surgery allow the use of a clamp similar to Satinsky in the cava vein. Hence we would proceed exactly as in the open surgery: renal vein would be sectioned at the level of the ostium, the hem-o-lok would be replaced by a suture, so the former argument would be invalidated.

In conclusion, from our perspective and experience, the shortness of right renal vein causes technical difficulties that can be easily overcome. Those difficulties could seldom justify the exclusion of the right kidney in living-donor kidney transplant program or the extension of the vein in the cadaveric kidney transplant program. Moreover, it is precisely the excessive length of the renal vein what permits its bending and angulation that may cause hemodynamic problems of difficult interpretation in the immediate postoperative period, that are difficult to interpret.

References


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