



ORIGINAL ARTICLE

A Longitudinal Flap of Vena Cava in Live Donor a Safe Option for Adding Elongation at Least 10mm in Vein of Right Kidney

Mohsen Mohammad Rahimi¹, Alireza Farshi², Farzad Kakaei², Afshar Zomorodi^{2*}

¹Kidney Research Center, Tabriz University of Medical Sciences, Tabriz, Iran

²Nephrology and Kidney Transplant Research Center, Imam Reza Hospital, Tabriz University of Medical Sciences, Tabriz, Iran

Corresponding Author: Afshar Zomorodi, E-mail: Afshar_z1000@yahoo.com, D_afshar@hotmail.com

ARTICLE INFO

Article history Received:
Aug 08, 2020
Accepted: Aug 13, 2020
Published: Aug 25, 2020
Volume: 5
Issue: 2

Key words:

Right Renal Vein, Short Vein, Right Kidney, Kidney Transplant, Flap, Cuff

ABSTRACT

Introduction: To treat chronic kidney, kidney transplantation is the most efficient way especially when donor is alive, in such a way that survival time can be increased in the best possible way. In this regard, major problem is short renal vein resulting in thrombosis. To elongate the vein length, there is a technique that we report in this study. **Materials and Methods:** The technique of interest is this that at the time of dissection of vena cava and renal vein, it should be tried to put vein of vena cava 1cm above and 1cm below of renal vein. In addition, kidney must be placed in right iliac of kidney done. **Results:** Patients discharged in good condition after two days. In our cases, there was no tension in the site of anastomosis showing safe condition. **Conclusion:** Longitudinal flap of vena cava accompanied by a suitable cuff can increase about 1 cm length of renal vein.

INTRODUCTION

Renal transplantation is a choice treatment for chronic renal failure in this modality of treatment quality of life and patient survival is near normal (1), but there are two big problems including: shortage of donor and medicine for antirejection. The left kidney according to its anatomic condition is better than right kidney for transplantation it must be mentioned that kidney transplantation with a good outcome about donor it depends: age of donor, sex kinder of donor, left kidney. Sometimes it is necessary and obligatory to select right kidney because it is rule that good kidney (big size, high glomerular filtration rate (GFR)) must be remained for donor (2).

A big problem with right allograft is short renal vein which predisposes to tension and thrombosis, for omitting the compromising effect of short renal vein we present a technique (a flap of vena cava with cuff) which can help for increasing length of renal vein at least 10mm which is very important in doing anastomosing.

MATERIALS AND METHODS

In Imam Reza hospital in ten chronic renal failure patients (3 female and 7 males) between ages of 35-65, in 4 patients etiology of renal failure were diabetic mellitus and in 6 patients etiology of renal failure were hypertension, in all of them right kidney of donors were selected for transplanting because the size of left kidneys in them were larger than right side (more than 10mm) and GFR of left kidneys were more than 10ml/minutes in comparing with right kidneys, So in them right kidneys of donors were removed and placed in

right Foss iliac of recipients. For removing kidney after dissecting renal vein and vena cava a Stansky with a fit size was placed on vena cava that which other than the renal vein it also contained at least one CM of vena cava at cephalic and one CM of vena cava at caudal of renal vein with a cuff of at least 5mm with vena cava.

The important point was that after resection of renal vein with flap and cuff of vena cava never trim was done (key point). In recipients at first vein was anastomosed and then artery was anastomosed. For anastomosing of renal vein of allograft on external iliac vein of kidney recipient an incision just in size similar with diameter of renal vein on external iliac was carried out (key point) and without any trimming of renal vein anastomosing performed as figure 1,2. All flaps and cuffs just were converted to length of vein. All patients

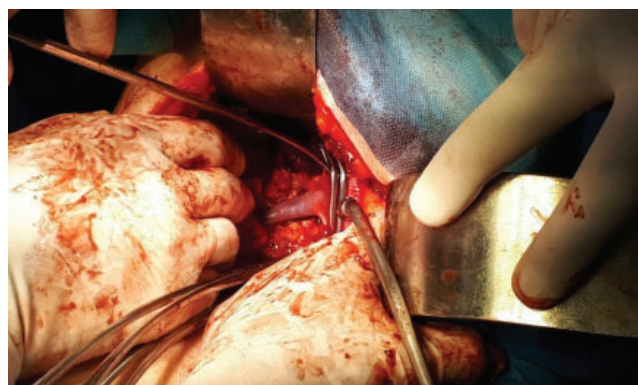


Figure 1. Longitudinal flap and cuff of inferior vena cava

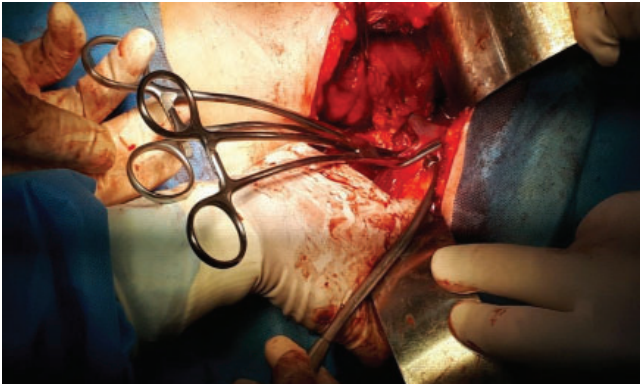


Figure 2. Longitudinal flap and cuff of inferior vena cava

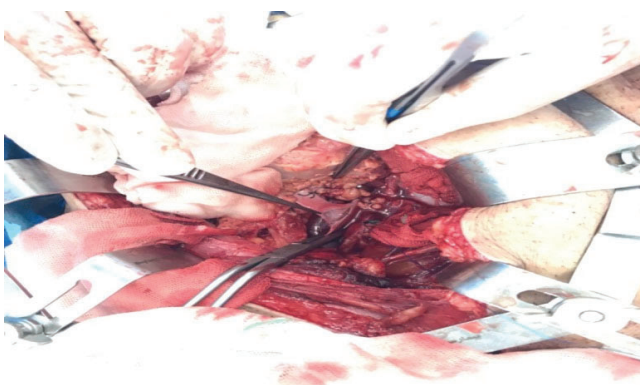


Figure 3. Anastomosing of longitudinal and cuff of inferior vena cava without any trimming

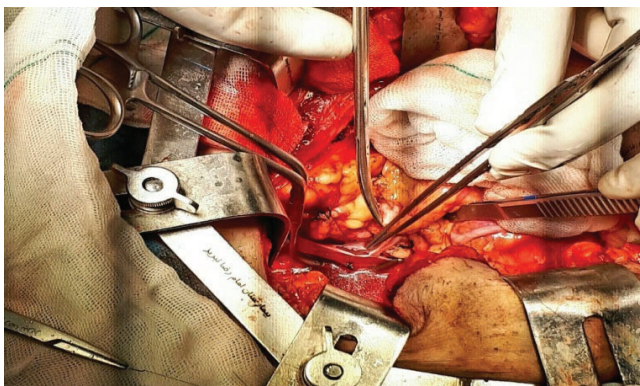


Figure 4. Anastomosing of longitudinal flap and cuff of vena cava to external iliac vein without any trimming

were treated for antirejection with three medicines including Prograf and Cellcept and prednisolone in none diabetic and Sandimmune and Cellcept and prednisolone with diabetic patients.

RESULTS

In all these ten cases length of renal vein were fit for anastomosing and anastomosis were done without any traction and tension. This modality may be an option for short right renal vein.

DISCUSSION

Still shortage of kidney donor is a big problem in kidney

transplantation for treatment of chronic renal failure so it seems that from any donor who has criteria of donation he or she must be a helper for saving the life of patient with any anatomic condition, left kidney is considered a better allograft than right principally for anatomic condition (1). Almost right kidney is selected for allograft transplantation less than left kidney because the right renal vein is short and renal artery larger than left kidney and several modalities have been advised for increasing the length of right renal vein in which one is using gonadal vein (3). Lateralization of iliac vein to the iliac artery may be effective for making possible to anastomosing short right renal vein but in a very obese patient it may increase the chance of formation lymphocele (4). Using biologic graft or PTEF prosthesis for increasing the length of renal vein has been advised (5). A modality has been advised for possible anastomosing short renal vein in right kidney by our center (6). In donor nephrectomy sometimes right kidney must be selected in condition like multiple artery with left kidney or cyst with right kidney or right kidney with small size and different in GFR more than 10ml/min between right and left kidney (7). A short vein in anastomosing may be in tension which may be result in thrombosis and finally graft loss (8-11). Fortunately, many manipulation have been done in inferior vena cava with safety including ligation of vena cava and also repairmen with bio graft and vein prosthesis IVC (12-15). It has been told that if necessary it is possible to reduce the lumen of IVC to 50 % of its size safely (16), with regarding all of mentioned above it looks that to use a right renal vein with a cuff and a longitudinal flap of IVC in both side of renal vein as we described here, may make possible to use right kidney to transplant from live donor with probable increase 10 mm longer in length of right renal vein.

CONCLUSION

A cuff of IVC with a longitudinal flap of vena cava at both side of renal vein which may increase at least 10mm length of right renal vein is feasible.

ACNOWLEDGMENTS (Funding source)

The authors would like to thank the patient to participate in this study. In this way, the authors would like to thank the deputy of the research of Tabriz University of Medical Sciences who sponsored this thesis.

AUTHOR CONTRIBUTION

AZ, AF and MMR; participated in research design, the writing of the paper and the performance of the research. FK and AZ; contributed to the study design, preparation of manuscript and final revision. MMR; consultant of study. All authors read and approved the paper.

CONFLICT OF INTEREST

There is no conflict of interest in this study.

ETHICAL STANDARDS

The research followed the tenets of the Declaration of Hel-

sinki. Written informed consent was obtained.

REFERENCES

1. Organ S. Consensus statement on the live organ donor. *JAMA*. 2000;284:2919-26. doi: 10.1001/jama.284.22.2919
2. Bollens R, Mikhaski D, Espinoza BP, Rosenblatt A, Hoang AD, Abramowicz D, Donckier V, Schulman CC. Laparoscopic live donor right nephrectomy: a new technique to maximize the length of the renal vein using a modified Endo GIA stapler. *Eur Urol*. 2007;51(5):1326-31. doi: 10.1016/j.eururo.2006.11.052
3. Feng JY, Huang CB, Fan MQ, Wang PX, Xiao Y, Zhang GF. Renal vein lengthening using gonadal vein reduces surgical difficulty in living-donor kidney transplantation. *World J Surg*. 2012;36(2):468-72. doi: 10.1007/s00268-011-1243-z.
4. Troncoso P, Guzman S, Dominguez J, Ortiz AM. Renal vein extension using gonadal vein: a useful strategy for right kidney living donor harvested using laparoscopy. In *Transplantation proceedings 2009* (Vol. 41, No. 1, pp. 82-84). Elsevier.
5. Hoda MR, Greco F, Reichelt O, Heynemann H, Fornara P. Right-sided transperitoneal hand-assisted laparoscopic donor nephrectomy: is there an issue with the renal vessels?. *J Endourol*. 2010;24(12):1947-52. doi: 10.1089/end.2010.0116.
6. Zomorodi A, Kakaei F, Zomorodi S. De Novo Techniques that Facilitate the Transplant of Short Right Allograft Kidney Vein as Left Allograft Kidney from Live Donor. *OJOTS*. 2012;2(02):5. doi: 10.4236/ojots.2012.22002
7. Branco AW, Branco Filho AJ, Kondo W, George MA, Maciel RF, Garcia MJ. Hand-assisted right laparoscopic live donor nephrectomy. *International Braz J Urol*. 2005; 31(5):421-30.
8. Lim WH, VAN SCHIE GR, Warr K. Chronic renal vein thrombosis in a renal allograft: Case Report. *Nephrol*. 2003;8(5):248-50.
9. Duckett T, Bretan PN, Cochran ST, Rajfer J, Rosenthal JT. Non-invasive radiological diagnosis of renal vein thrombosis in renal transplantation. *The Journal of urology*. 1991 Aug; 146(2 Part 1):403-6. *CEN Case Rep*. 2018;7(2): 264-7. doi: 10.1007/s13730-018-0340-3
10. Król R, Cierpka L, Ziąja J, Pawlicki J, Budzinski G. Surgically treated early complications after kidney transplantation. In *Transplantation proceedings 2003* (Vol. 35, No. 6, pp. 2241-2242). Elsevier.
11. Nuzzo G, Giordano M, Giuliante F, Lopez-Ben S, Albiol M, Figueras J. Complex liver resection for hepatic tumours involving the inferior vena cava. *European Journal of Surgical Oncology (EJSO)*. 2011;37(11):921-7.
12. Quinones-Baldrich W, Alktaifi A, Eilber F, Eilber F. Inferior vena cava resection and reconstruction for retroperitoneal tumor excision. *J Vasc Surg*. 2012;55(5):1386-93; discussion 1393. doi: 10.1016/j.jvs.2011.11.054.
13. Vladov NN, Mihaylov VI, Belev NV, Mutafchiiski VM, Takorov IR, Sergeev SK, Odisseeva EH. Resection and reconstruction of the inferior vena cava for neoplasms. *World J Gastrointest Surg*. 2012;4(4):96-101. doi: 10.4240/wjgs.v4.i4.96
14. Azoulay D, Andreani P, Maggi U, Salloum C, Perdigo F, Sebah M, Lemoine A, Adam R, Castaing D. Combined liver resection and reconstruction of the supra-renal vena cava: the Paul Brousse experience. *Ann Surg*. 2006;244(1):80. PMID: doi: 10.1097/01.sla.0000218092.83675.bc
15. Hemming AW, Reed AI, Langham Jr MR, Fujita S, Howard RJ. Combined resection of the liver and inferior vena cava for hepatic malignancy. *Ann Surg*. 2004;239(5):712. doi: 10.1097/01.sla.0000124387.87757.eb
16. Aria Olumi, Mark Preston, Micheal Blute. Open surgery of the kidney. *CAMPBELL-WALSH UROLOGY*. Eleventh Edition, volume 2, chapter 60, 1414.