

## Is Placing an Expansion Space at the Anastomosing Site of the Vessel for Prevention of Pursiness, Safe?

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### Abstract

Kidney replacement is the best option for treatment of chronic renal failure patient. This treatment sometimes associates with some complications including: immunologic, vascular and urologic. The vascular complication is a dangerous complication which sometimes may result in losing allograft kidney.

The vascular complications including: thrombosis and stricture. These complications can be induced by rejection or by technical fault. The technical fault including: the handling of the vessel and suturing of the vessel. One of the preventable faults is pursiness which may predispose the vessel to the stenosis. We studied the making expansion space between the vessel and first knotting of stitching for prevention of the pursiness of the vessel post anastomosis.

**Material and methods:** One hundred chronic kidney disease patients 51 males and 49 females with age between 15-67 have been operated for kidney transplant surgery at Imam Reza hospital (teaching hospital) since 2008 -2011. All of the patients have received allograft kidney from live unrelated donors. During surgery after preparation place for allograft kidney at retroperitoneal at fosse of iliac the internal iliac artery (hypogastric artery) have been selected for renal artery anastomosis and external iliac vein have been selected for renal vein anastomosis. During vessel anastomosis between vessel and first knotting of stitching (continue suture with single thread) 5mm distance have been made as expansion space. After removing the clamp from the vessel bleeding has been controlled, post operation the kidney has been followed by color Doppler ultrasound.

**Results:** Post declamping the vessel, the expansion space was vanished and the hemeostasis was nearly complete without any significant bleeding and also without detecting any stenosis at anastomosing site with follow up with color Doppler ultrasound at least for 6 months post operation.

**Conclusions:** making expansion space between the first knot of stitching and the vessel at the anastomosing site for prevention of the pursiness of the vessel and stenosis is safe.

**Keywords:** Thrombosis; Stenosis; Kidney transplant; Pursiness; Expansion

### Introduction

Kidney transplant is the best choice for treatment of chronic renal failure patient [1], but still some complications are associated with this approach including, immunologic complication and surgical complication. The surgical complications including: vascular complication, urologic complication. The vascular complications are two kinds: early and delayed, the early complication including stenosis and thrombosis. The early vascular complications are due to technical [2] which may be due to handling allograft vessel during procurement and irrigation (vessel trauma) and preparing recipient vessels (trauma) and anastomosing [3,4]. In kidney transplant anastomosing of the vessel may be carried out as end to end or end to side, end to side is less predisposes to stenosis [4]. One of the most important problem with anastomosing is pursiness of anastomosing site which may predisposes to stagnation and thrombosis and stenosing. One of the suggestions for reduce chance of pursiness is to put expansion space for first knotting of stitching. In our kidney transplant center we studied the safety of the expansion space at first knotting of stitching for prevention of pursiness.

### Material and Methods

In the kidney transplant center of Imam Reza hospital since 2009 till 2012, in one hundred of kidney recipients 56 males 44 females age (15-67) with allograft kidney from live unrelated donors, for anastomosing the renal vein and the renal artery continue suture were used and at the completing suture (Prolene -five O for vein anastomosis and prolene six -O for artery anastomosis) at least 5 mm distance between the vessel and the first knotting of stitching were made by putting

forceps with diameter of 5 mm between vessel and knotting (expansion space) (Figure1). After completing suture (Figure 2) the hemeostasis was controlled if there was pulsating bleeding and more than needle whole bleeding it was repaired with separate suture. Post operation the anastomosing site and circulation at the vessel has been evaluated by color Doppler ultrasound.

### Results

In one hundred kidney recipients with expansion space at the anastomosing site of the vessels, after removing clamps from the vessels there was not any compromised condition and needle whole bleeding have been controlled by gentle finger pressure on it and some pulsating bleeding have been controlled by 6-0 prolene suture easily and follow up by color Doppler ultrasound indicated normal fellow and normal vessel without stenosis. This follow up has been carried out at least for 6 months.

### Discussion

Vascular complication in renal transplantation is very important because it may cause graft loss; almost all of the vascular complications

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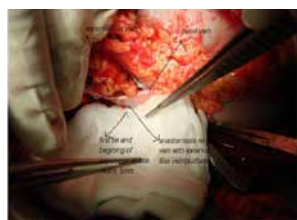
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are due to technical faults. These technical faults may be associated with the vessel of allograft kidney or the vessel of recipient. Procurement of the kidney from donor is very important and trauma to the vessel especially excessive traction at the vessel during nephrectomy or unsafe clamping of vessel are conditions that which may cause the injury of the vessel and predispose to the sever complication. Kind of thread and the method of stitching including continue and separate are associated with the technical fault of vascular complication during anastomosing. The continue sutures predispose the vessel to pursiness in which the stagnation of the flow is possible. The end to side anastomosis is safer than end to end because with the end to end anastomosis the risk of stenosis three times is more common than the end to side anastomosis [3,4]. With making the expansion space between the first knotting and the vessel it will permit to the vessel to have place for expansion after removing the clamp (Figure 1-5) post removing the clamp there is no pursiness condition (Figure 4 and 6). This expansion place prevent from pursiness and also from stagnation. In all these cases (of course without acute rejections) we have not any stenosis and thrombosis with the artery and the vein except a few cases with acute rejection in which the acute rejection cause thrombosis and stenosis.

Renal artery stenosis is the most common vascular complication after kidney transplantation. The frequency of the renal artery stenosis has been reported between 1% to 21% [5]. Renal artery stenosis is caused by atherosclerosis of the donor artery, suture technique, trauma to either donor or recipient artery during procurement or transplant surgery, and kinking or damage to the iliac artery during transplantation. Renal artery stenosis is more common at the site of the anastomosis of the donor renal artery to the native artery of recipient (surgical technique)



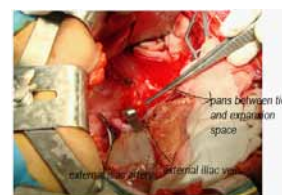
**Figure 1:** Expansion space at anastomosing site, there is nearly 5 mm distance between first tie and vein(expansion space).



**Figure 2:** Expansion space between first tie and vein nearly 5 mm.



**Figure 3:** Expansion space between first tie and artery nearly 5 mm.



**Figure 4:** Expansion space has been vanished post declamping.



**Figure 5:** With putting forceps to helping to make space between tie and vessel.



**Figure 6:** After removing the clamp from the vessel the expansion space was vanished by expansion of the vessel.

and less common in the distal donor artery (intimal injury, perforation by cannula). Most often the vascular stenosis are seen between 3 and 12 months after transplantation [6]. The stenosis which occurs in the later period, it is as a result of atherosclerotic disease in the transplant renal artery or in the proximal iliac artery.

Renal vein thrombosis (RVT) is an infrequent but disastrous complication usually occurs in the first week following the transplantation. The incidence of RVT have been reported between 0.9 to 4.5% [7], it is often due to poor surgical technique and perigraft fluid collection and hypovolemia [8].

The stenosis is usually situated at the anastomosis site and less frequently it may found on either side of the anastomosis. The suture site stenosis is due to technical reasons and it is usually permanent [9].

The significant association of renal graft thrombosis and technical faults has been frequently stressed in most of reported series [10-15]. Despite progress in immunosuppressive treatment, surgical technique, prevention and management of infection the vascular complication account 3-15% of graft dysfunction cases [4,16,17]. In our study, post operation control by the color Doppler ultrasound at least 6 months post operation did not disclose any significant vascular complication in cases without rejection but with regarding another study by our colleague from our center but without using expansion space there was near 20% vascular complication [18], so there is huge difference at the results of control by color Doppler ultrasound in using expansion space (none- at our study) and without expansion space (20%-report by our colleague from our center at other study) [18]. At the cases of the expansion space there was not any significant bleeding with compromise the grafts and the recipients but there were some bleeding which can be controlled by gentle pressure by finger or by suturing.

It seems that expansion space at anastomosing place is safe and this method with edge averting suture may be important at reducing the technical vascular complication but it needs study with more cases and long time and graft survival evaluation for establishing.

## Conclusion

Making 5 mm distance between the first knotting of stitching and the vessel (expansion space) is safe for the graft and the recipient and it seems that it may reduce the technical vascular complications which needs some more study with more cases with evaluation of graft survival and patient survival at more long time for confirmation.

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