

## Acute renal artery thrombosis after kidney transplantation

### *Trombose aguda de artéria renal após transplante de rim*

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#### Abstract

Early kidney transplant loss as a result of acute thrombosis of the renal artery remains a constant and devastating complication, with an incidence of 0.2-7.5%. While uncommon, arterial obstruction in the early postoperative period is a surgical emergency and must be ruled out if previously established diuresis ceases suddenly. Arterial thrombosis may occur as a result of injury to a diseased artery, problems with anastomoses, hypercoagulability or malpositioning of the allograft. In this study, we analyzed data on a group of 105 renal transplant recipients who presented with acute postoperative graft dysfunction between January 2006 and May 2012, to identify cases of acute renal artery thrombosis. We report on our experience of immediate re-transplantation following early kidney transplant thrombosis. Overall, two (1.9%) patients suffered early (within 48 hours of surgery) allograft renal artery thrombosis. In both patients, transplantation had not been complicated by atherosclerotic lesions or other thrombophilic states and postoperative diuresis had been successfully achieved, but diuresis ceased abruptly during the early postoperative period. Emergent duplex ultrasound scans were performed and acute renal artery thrombosis was detected in both patients. The patients were operated immediately and retransplantation procedures were conducted. We have reported our experience of immediate retransplantation following early primary graft dysfunction due to renal artery thrombosis. In conclusion, close monitoring of postoperative diuresis and, if necessary, immediate retransplantation in this situation can prove to be a successful treatment for preventing graft loss.

**Keywords:** renal artery; thrombosis; kidney transplantation.

#### Resumo

A perda precoce de transplante renal resultante de trombose aguda da artéria renal permanece sendo uma complicação constante e devastadora, com uma incidência de 0,2-7,5%. Apesar de incomum, a obstrução da artéria no período pós-operatório imediato é uma emergência cirúrgica e deve ser descartada caso a diurese previamente estabelecida se interrompa de forma súbita. A trombose arterial pode ocorrer como resultado de dano à artéria previamente doente, problemas com anastomoses, hipercoagulabilidade ou mal posicionamento do enxerto. Neste estudo, analisamos os dados de 105 receptores de transplante renal que apresentaram disfunção aguda do enxerto no pós-operatório entre janeiro de 2006 e maio de 2012, para identificar casos de trombose aguda da artéria renal. Relatamos nossa experiência com retransplante imediato após trombose precoce de transplante renal. Ao todo, dois (1,9%) pacientes apresentaram trombose precoce (dentro de 48 horas após a cirurgia) da artéria renal do enxerto. Em ambos os casos, não haviam ocorrido complicações relacionadas a lesões ateroscleróticas ou outros estados trombofílicos durante o transplante, e a diurese pós-operatória havia sido estabelecida com sucesso, porém cessou bruscamente no pós-operatório imediato. Ecografia dúplex de emergência foi realizada e revelou trombose aguda de artéria renal nos dois pacientes. Os pacientes foram operados imediatamente, e foi realizado o retransplante. Relatamos nossa experiência com retransplante imediato após disfunção precoce do enxerto primário devido a trombose da artéria renal. Conclui-se que o monitoramento da diurese no pós-operatório e, se necessário, a realização do retransplante imediato nessa situação podem ser um tratamento bem-sucedido para evitar a perda do enxerto.

**Palavras-chave:** artéria renal; trombose; transplante renal.

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Financial support: None.

Conflicts of interest: No conflicts of interest declared concerning the publication of this article.

Submitted: May 09, 2014. Accepted: August 07, 2014.

This study was conducted at Pamukkale University Kidney Transplant Center.

## ■ INTRODUCTION

Early kidney transplant loss as a result of acute thrombosis of the renal artery remains a constant and devastating complication, with an incidence of 0.2-7.5%.<sup>1-4</sup> While uncommon, arterial obstruction in the early postoperative period is a surgical emergency and must be ruled out if previously established diuresis ceases suddenly. Although radioisotope and ultrasound scans can confirm vascular occlusion, immediate reoperation is the only option for salvaging the graft because it can only tolerate a few minutes of total ischemia. Arterial thrombosis may occur as a result of injury to a diseased artery, problems with anastomoses, hypercoagulability or malpositioning of the allograft.<sup>5</sup> In this study, we analyzed data on a group of 105 renal transplant recipients who presented with acute postoperative graft dysfunction between January 2006 and May 2012, to identify cases of acute renal artery thrombosis. We report on our experience of immediate re-transplantation following early kidney transplant thrombosis.

## ■ CASE REPORT

We performed 105 kidney transplantations at our kidney transplantation center at Pamukkale University between January 2006 and May 2012. Transplants were performed after confirmation of negative cross-match. Operations were performed using a standard surgical technique with end to side anastomosis to the recipient external iliac vessels. Diuresis is monitored hourly during the postoperative period.

Overall, two (1.9%) patients suffered early (within 48 hours of surgery) allograft renal artery thrombosis. In both patients, transplantation had not been complicated by atherosclerotic lesions or other thrombophilic states and postoperative diuresis had been successfully achieved, but diuresis ceased abruptly during the early postoperative period. Emergent duplex ultrasound scans were performed and acute renal artery thrombosis was detected in both patients. The patients were operated immediately and retransplantation procedures were conducted. The time from loss of diuresis to reestablishment of renal flow was 52±7 minutes and warm ischemia time was 35±5 minutes. After breaking down the anastomosis, the graft was perfused with cold 0.9% NaCl solution and then renal artery and vein re-anastomosis was performed. We ruled out thromboembolic etiologic factors on the basis of hematology test results. In the first patient, graft function was absent six months after retransplantation and dialysis was continued.

In the other patient, 2 months after retransplantation, creatinine levels gradually decreased and the patient became independent of dialysis treatment. A radioisotope scan was performed, once more showing graft viability. Fourteen months after retransplantation this patient is still off dialysis and the last creatinine result was 1.4 mg/dl.

## ■ DISCUSSION

We have presented two cases of immediate re-transplantation after early kidney transplant thrombosis treated at our center. Primary renal transplant failure is associated with significant mortality, particularly when the cause of graft loss is thrombosis. Thrombosis of the renal artery occurs as a result of a reduction in the cross-sectional area of the renal artery, usually for technical reasons, and can occur at any time.<sup>2</sup> The most significant risk factors for thrombosis are donors younger than 6 or older than 60 years or recipients aged younger than 5-6 years; perioperative or postoperative hemodynamic instability; peritoneal dialysis; diabetic nephropathy; history of thrombosis; deceased donor; and more than 24 hours of cold ischemia time.<sup>1</sup> Contributory factors include poor cardiac output, thrombophilic states, and increased intrarenal pressure as seen with acute tubular necrosis or acute rejection.<sup>1</sup> Diagnosis is made by immediate duplex ultrasound or at the time of surgical exploration. Arterial thrombosis is a terminal event and can be averted only if arterial inflow is considered as a cause of poor graft function and intervention is undertaken immediately. By the time of diagnosis, it is too late to save the kidney transplant.<sup>6</sup>

Doppler ultrasound is a suitable screening method for detection of impaired graft perfusion.<sup>7</sup> Radiological interventional techniques should be regarded as potentially effective and safe for the treatment of early vascular complications after renal transplantation.<sup>8</sup>

Incidence of renal graft thrombosis was significantly increased at both extremes of donor age; with female donors; and after prolonged total duration of ischemia.<sup>9</sup> We have reported our experience of immediate retransplantation following early primary graft dysfunction due to renal artery thrombosis.

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