Controversy: To Ligate or Not to Ligate Arteriovenous Accesses: PRO

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transplant recipients leads to a decrease in LV mass, but until recently no randomized controlled study had been conducted to show the impact of AVF ligation on LV mass in kidney transplant recipients (9, 10).

In 2019, Rao et al. (11) conducted a randomized controlled trial in which kidney transplant recipients with stable kidney allograft function were randomized to AVF ligation or no AVF ligation 1 year after kidney transplantation. The baseline characteristics were well matched in the two groups. All patients underwent cardiac magnetic resonance imaging (MRI) at baseline and at 6 months to assess the change in LV mass. AVF flow rates were not reported in this study, and both groups had the same proportion of forearm and upper arm AVF. The follow-up cardiac MRI showed that the AVF ligation group (n = 27) had a 15% reduction in LV mass, whereas no significant change in LV mass was observed in the control group (n = 27). The study provides clear evidence that regression in LV mass index occurs after AVF ligation in kidney transplant recipients, but the question that remains unanswered is whether the decrease in LV mass index translates into better CV and overall outcomes.

Currently, no guidelines exist to determine the fate of the AVF after kidney transplantation. The advantage of having a functional AVF after kidney transplantation is that it can be used for future dialysis if the kidney allograft fails. AVFs have a high primary failure rate, and a functional AVF is a precious commodity. Therefore, abandoning a functional AVF is not a straightforward decision.

The long-term kidney allograft outcomes have improved, and the decision to ligate an AVF after kidney transplantation should be based on several patient-related and AVF-related factors. The goal should not be to merely preserve an AVF at all costs. Several factors must be taken into account when making the decision regarding the fate of the AVF after kidney transplantation, such as the likelihood of kidney allograft failure, AVF flow rate and its impact on cardiac structure and function, local effects of the AVF (e.g., aneurysms), and patient preference (cosmetic, functional, quality of life). Clinicians must also be familiar with AVF flow reduction procedures that may help preserve a functional AVF while potentially addressing the complications resulting from the high flow AVF (12).

The approach to AVF ligation after kidney transplantation must be patient-centered, and a one-size-fits-all approach must be avoided. The recent study by Rao et al. (11) offers a clear insight into the impact of AVF ligation on cardiac structure. We look forward to future studies to learn whether these structural cardiac changes translate into better outcomes. Until then we must continue to individualize the decision regarding AVF ligation in kidney transplant patients.

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References


Controversy

To Ligate or not Ligate Arteriovenous Accesses: CON

By Loay Salaman

Kidney transplantation remains the best treatment option for patients with end stage kidney disease (ESKD). However, a dilemma faces healthcare providers when they care for ESKD patients: whether to ligate the patient’s arteriovenous (AV) access after kidney transplantation or leave it patent and maintain it. There is still considerable disagreement among providers on the best course of action when dealing with an AV access after kidney transplantation (1).

In this article, I will discuss the disadvantages of ligating an AV access after kidney transplantation.

The 1-year and 5-year kidney graft survival rates range between 87% and 95% and 65% and 83%, respectively, based on a donor’s status (2). Therefore, significant numbers of kidney transplant recipients will end up receiving dialysis again in the future. And this means that these patients will need AV access when reinitiating dialysis. Creating a new AV access, if the original access was ligated, carries its own challenges and risks. They include not only the risk of the procedure itself, the lead time to maturation, the primary failure rate, the failure rate of related procedures, and the need for tunneled hemodialysis catheters (TDC) but also the difficulty of finding a suitable artery and vein that meet the criteria for AV access creation (3). Two-thirds of patients with a failed kidney transplant start hemodialysis with a TDC (4). Using a TDC by itself adds significant morbidity and mortality to patients with an already higher morbidity and mortality risk than their peers (5).

There is no proven benefit to patient mortality of an access ligation after kidney transplantation. Hicks et al. (6) used the United States Renal Data System to look at 16,845 patients with AV access who received kidney transplants between January 2011 and December 2013. Access ligation occurred in 4.6% of these patients. There was no morbidity and mortality risk than their peers (5).


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It is also important to mention that studies have shown some conflicting results of the effect of AV access ligation on cardiac parameters. Rao et al. (9) conducted a randomized controlled trial among kidney transplant recipients (>12 months after transplantation with stable kidney graft function) comparing AVF ligation with no ligation. They randomized 84 patients and used cardiac magnetic resonance imaging at baseline and at 6 months after ligation. AVF ligation resulted in a significant reduction in left ventricular (LV) mass as compared with an increase in the control group but with no significance in LV ejection fraction. In other work, Latarzinha et al. (10) conducted a study on 17 patients after kidney transplan-
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2019;...access and intravenous therapies (4), leading to a high...nology and hypertension, the Thomas Ordway Distinguished...nephrology and hypertension, the Thomas Ordway Distinguished...of Medicine at Albany Medical College, and the medical director of Dialysis Clinic, Inc., Albany.

References


Are You Still Getting Called Regarding Peripherally Inserted Central Catheters?

By Ammar Almehmi and Sloan E. Almehmi

Peripheral catheters are increasingly used in modern clinical practice, especially among critically ill patients (1). The main attraction to the use of PICCs in clinical practice is likely driven by their perceived safety, low procedural complication rate, ability to facilitate care transition, low cost, and ease of insertion (2, 3).

PICCs are used for several indications, including extended antibiotic therapy, difficult venous access, total parenteral nutrition, chemotherapy, and occasionally central venous monitoring. They are usually single-lumen or dual-lumen catheters that are inserted under ultrasound guidance by a nurse-led team. Above-the-elbow basilic, brachial, or cephalic veins are commonly used for PICC insertion, with the catheter tip being in the central venous system (superior vena cava, subclavian vein, or brachiocephalic vein). Because more than 50% of critically ill patients require venous access, the use of PICCs is seen as a marker for a high burden of morbidity. Patients with chronic kidney disease (CKD) and those using dialysis have a high burden of comorbidities related to a cluster of risk factors, both traditional (such as diabetes, hypertension, peripheral arterial disease, and heart failure) and nontraditional (abnormal mineral metabolism, left ventricular hypertrophy, and anemia). This profile of comorbidities places CKD patients at a higher risk for hospitalization, which usually requires venous access and intravenous therapies (4), leading to a high exposure to PICCs.

It is well acknowledged that PICC placement is associated with significant morbidity and mortality. In a comprehensive review and meta-analysis of approximately 50,000 patients, PICCs were associated with an increased risk of deep vein thrombosis and residual central venous stenosis (5). Furthermore, PICCs are associated with three times the risk of all-cause thromboembolism (4). Moreover, other complications of these catheters include thrombophlebitis and catheter-associated bacteremia with subsequent sepsis, endocarditis, and osteomyelitis (6).

The PICC-related complications have deleterious effects on vein quality and are associated with a lower frequency of functional arteriovenous (AV) fistulas in the CKD population (2). In a case control study, ElFetrs et al. (2) compared the PICC exposure in 120 patients receiving dialysis through a dialysis tunneled catheter or an AV graft with the exposure to 162 patients receiving dialysis through an AV fistula. They found that the frequency of previous PICC exposure was higher among AV fistula patients (44% vs. 20%), and this exposure was associated with fewer functioning AV fistulas (p < 0.001).

By contrast, in a dialysis population, McGill et al. (7) used the US Renal Data System to analyze 34,000 patients who started dialysis by central venous catheter and found that 12.6% of them had previously used PICCs. Furthermore, PICC placement before or after dialysis initiation were independently associated with a low likelihood of transition to AV fistula or graft. The presence of these catheters within the vein lumen for prolonged times is associated with repetitive trauma and subsequent thrombosis and stenosis (8).

Accordingly, the American Society of Nephrology, as part of the American Board of Internal Medicine’s “Choosing Wisely” campaign, recommended consulting nephrologists before inserting PICCs in patients with CKD stage 3 to 5 (9). Moreover, the National Kidney Foundation Kidney Disease Outcomes Quality Initiative guidelines for vascular access recommended preservation of the forearm and upper arm veins, which are suitable for fistula creation, in patients with CKD stage 4 or 5. These veins should not be used for venipuncture or the placement of PICCs (5).

Now, with all these practice guidelines in place that discourage the use of PICCs in the CKD population, why are we still getting called or consulted regarding PICCs? With the increased risk of vein depletion of the upper extremity caused by healthcare-related venipuncture, how are we, as nephrologists, performing as the gatekeepers of the venous real estate for our CKD patients? The honest answer is that despite the available guidelines and the known disastrous effects of PICCs, a substantial number of dialysis patients continue to receive PICCs under the watch of their nephrologists (3).

 Whereas some programs have already developed institutional protocols in which PICC insertion orders in patients with CKD stage 3 to 5 trigger the need for a nephrology consultation, most community hospitals lack such processes and protocols. Furthermore, despite these efforts and guidelines to avoid PICCs in patients with advanced CKD, 33.1% of short-term PICCs (bwell time <5 days) were seen in patients with GFR <60 mL/