The article discusses the high prevalence of cardiovascular disease in patients with end-stage renal disease and the significant impact of valve surgeries in renal transplant recipients. The introduction highlights the increased calcification rate in dialysis patients compared to the general population and the increased progression of aortic stenosis in this population. The case report presents a 70-year-old man from Kenya who presented with symptoms of dyspnea and angina after renal transplantation 3 years prior. Transthoracic echocardiography revealed degenerative aortic valve disease, severe calcific aortic stenosis, and normal left ventricular function. The patient was an ideal candidate for transaortic aortic valve implantation (TAVI) but faced economic constraints. The authors review the factors and outcomes associated with valve surgeries in renal transplant recipients and evaluate the strategy for open heart surgery after renal transplantation performed.
He is doing well in regular follow-ups: Physical visits and telephonic and maintaining INR around 1.5 with oral anticoagulant and is symptom-free.

DISCUSSION

Cardiovascular disease and infectious complications remain the leading causes of death in kidney transplant recipients.\cite{5} Patients with chronic renal failure more often develop premature calcification of the mitral and aortic valve compared to the general population.\cite{4,6} The number of kidney transplant recipients that may require aortic valve heart surgery will increase as their longevity improves and as the average age of kidney transplant recipients rises. Patients with severe symptomatic AS have a poor prognosis with medical treatment alone. Patients with chronic renal failure and kidney transplant recipients experience an increased risk of adverse outcomes after open heart surgery. Kidney transplant recipients with severe aortic valve stenosis are often at higher risks for open heart surgical valve replacement due to impaired kidney function, potential side effects of immunosuppressive therapy, and related comorbidities. Furthermore, the increased susceptibility of kidney allograft failure using extracorporeal circulation may alter the prognosis of kidney transplant patients undergoing cardiac surgery.\cite{7}

Data from the US Renal Data System database indicate that the intrahospital mortality of kidney transplant recipients undergoing valvular heart surgery is 14%, and 2-year mortality after cardiac valvular surgery in postrenal transplant patients is 40%.\cite{5} Renal transplantation patients requiring valve replacement have high mortality rates (20%/year). Therefore, these patients have to be considered as high-risk patients.

Another issue in the management of such patients is the choice between mechanical and tissue valves. Use of bioprosthetic heart valves in hemodialysis patients was prescribed in past American College of Cardiology/American Heart Association guidelines, reflecting a widely held (but poorly supported) perception of a high incidence of bioprosthetic valve failure mandating implantation of mechanical prosthetic valves in these patients.\cite{8} Herzog et al. reported an estimated 2-year mortality of 60%, with no difference in survival for tissue versus nontissue valves in their 2002 article on outcomes of dialysis patients after heart valve replacement surgery.\cite{9} Reflecting these new data, revised 2006 practice guidelines rescinded

Routine preoperative work-up was satisfactory. The patient was operated and elective replacement of the aortic valve with #21 Saint Jude Medical mechanical valve was done. Care was taken to minimize blood loss to avoid transfusion of blood and blood products; so as to avoid any immunogenic stimuli. Bloodless crystalloid prime was used. Standard surgical techniques and cannulation were used. Higher perfusion pressure was maintained, and urine output was closely monitored through the surgery. Vasoconstrictors (injection noradrenaline, dopamine, and dobutamine inotropes were used in mild dosage) were used in view of the severe concentric hypertrophy of LV from severe AS and to maintain higher perfusion pressure. Activated clotting times were between 480 and 600 s as recommended for routine practice. Furosemide was administered during the surgery to encourage diuresis to reduce the hemodilution as only crystalloid prime was used initially to avoid blood products. Cardiopulmonary bypass time = 91 min and aortic cross-clamp time = 76 min.

In the postoperative period, the patient was kept adequately hydrated, and the triple immunosuppression protocol was continued. Pulse steroids were initiated to prevent graft rejection. Inotropes were continued in the early postoperative period to maintain good hemodynamics. Diuretics were administered to maintain an adequate urine output, given that hydration and renal perfusion were satisfactory. The patient was watched for fever and white blood cell count regularly. Nephrotoxic medications were avoided. Renal function was closely monitored until discharge. Postoperative serum creatinine had only a moderate rise postoperatively and returned to preoperative value in 3 postoperative days. No dialysis was required. Predischarge two-dimensional-echocardiogram revealed a normal functioning prosthetic valve.

The patient had an uneventful recovery and was discharged from the hospital on the sixth postoperative day.

Nephrology consultation was done and was advised to continue the triple immunosuppression protocol: Mycophenolate mofetil (500 mg), tacrolimus (1 mg) and prednisolone (20 mg). Last preoperative dose of mycophenolate mofetil and tacrolimus was given 1 h before induction on the day of surgery. Last dose of steroid was switched over from oral prednisolone to intravenous hydrocortisone (200 mg) before shifting to OT.

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the proscription of bioprosthetic valves in dialysis patients.[8]

We used a mechanical valve in our case in order to avoid any immunogenic tissue in the tissue valve, its being a xenograft. Moreover, the rate of calcification and degeneration in tissue valve is higher when used in postrenal transplant patients.

Recently, TAVI has demonstrated improving survival, quality of life, and functional status in nonoperable patients and has been shown to be a viable option in high-risk patients.[10] TAVI appears to be an effective and safe alternative to conventional surgery for aortic valve replacement in patients with prior renal transplantation.

CONCLUSION

Patients with chronic renal failure and kidney transplant recipients experience an increased risk of adverse outcomes after open heart surgery. Renal transplantation patients requiring valve replacement have high mortality rates (≈20%/year).

Infection control and renal protection should be stressed to ensure the safety of cardiac surgery in this patient group, while preoperative renal insufficiency, mitral valve disease, and LV dysfunction are associated with early adverse outcomes.

Establishing the minimum effective dose of immunosuppressant is crucial to prevent postoperative infections and loss of the renal graft.

There is statistically insignificant difference in terms of outcomes in usage of mechanical versus tissue valves.

TAVI is promising to be a viable option in high-risk patients with prior renal transplantation and also appears to be an effective and safe alternative to conventional surgery.

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Conflicts of interest
There are no conflicts of interest.

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