Bilateral native nephrectomy for refractory hypertension in kidney transplant and kidney pancreas transplant patients

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Abstract

Hypertension is common in renal transplant patients and sometimes very difficult to control. Refractory hypertension can adversely affect renal graft and patient survival. Many antihypertensive medications are not well tolerated or can have important drug interactions with immunosuppressive medications. These drugs can cause significant side effects including fluid depletion, azotemia, electrolyte imbalance, and anemia. Bilateral native nephrectomy in renal transplant patients has been reported to be beneficial in controlling severe hypertension.

We report five patients with severe hypertension despite as many as 9 different antihypertensive medications. All patients had previous kidney or simultaneous kidney pancreas transplantation. Each of our patients underwent laparoscopic bilateral native nephrectomy.

Renal function varied from creatinine of 1.4–2.4, and the number of antihypertensive medications from 3 to 9 at the time of nephrectomy surgery. Mean arterial blood pressure improved in all five patients at 3–6 months post nephrectomy, the number of antihypertensive medications decreased in 4, but renal function remained stable at 3–6 months in only 2 patients.

We found laparoscopic bilateral native nephrectomy to be beneficial in renal and simultaneous kidney pancreas transplant patients with severe and refractory hypertension. Our patients with better baseline renal allograft function at time of nephrectomy received the most benefit. No decrease in allograft function could be attributed to acute rejection.

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1. Introduction

Hypertension is common and sometimes difficult to control following renal transplantation or kidney pancreas transplantation. Hypertension can significantly affect both kidney allograft function and patient survival if it is not effectively controlled. Antihypertensive medications may not be well-tolerated due to significant side effects. Diuretics can cause fluid depletion, azotemia, and electrolyte imbalance. Calcium blockers interact with calcineurin inhibitors, angiotensin-converting enzyme inhibitors and angiotensin receptor blockers can cause hyperkalemia and anemia. Vasodilators can result in significant edema and sympatholytic antihypertensives usually have CNS side effects (Fig. 1).

There have been several case reports in the literature suggesting that bilateral native nephrectomy can be beneficial in patients with severe resistant hypertension following renal transplant [1–7].

2. Presentation of cases

We report five patients with severe hypertension refractory to multiple antihypertensive medications, all eventually underwent laparoscopic bilateral native nephrectomy. Three of our patients had simultaneous kidney pancreas transplant prior to their bilateral native nephrectomy. All five patients were receiving immunosuppression with tacrolimus. Mycophenolate, and low dose prednisone. No patient was considered a candidate for bilateral nephrectomy pre transplant because they did not have refractory hypertension prior to transplant. All 5 patients had hypertension prior to transplant. All patients were screened for renal artery stenosis using Doppler ultrasound and/or arteriograms. Noncompliance with medication was felt unlikely as they had refractory hypertension in the hospital where medication compliance was observed (Fig. 2).
Table 1
Demographics.

| Age | Sex | Race | Disease | Transplant |
|-----|-----|------|---------|------------|
| 58  | F   | C    | DM      | KP         |
| 52  | M   | AA   | FSGS    | K          |
| 60  | M   | C    | DM      | KP         |
| 49  | M   | AA   | HTN     | K          |

### Fig. 1
Shows MAP in our patients pre-and post nephrectomy.

### Table 2
Compares serum creatinine pre and post nephrectomy for all 5 patients.

### 3. Discussion

All five of our patients had an uncomplicated postoperative course following their bilateral native nephrectomy. There was no postoperative hemorrhage, postoperative infections, pulmonary emboli; all patients underwent careful preoperative studies to exclude other causes for refractory hypertension such as transplant renal artery stenosis and adrenal tumors as well as medication noncompliance (Fig. 3).

Bilateral native nephrectomy was beneficial in reducing mean arterial pressure in all five patients, and decreasing the number antihypertensive meds in 4 patients. Renal function remained stable in 3 patients, but decreased in two. The 3 patients who benefited the most i.e., improvement in BP, decrease or no increase in number antihypertensive meds, and stable renal function had a lower baseline creatinine at the time of bilateral nephrectomy. The two patients with higher baseline creatinine levels had improved BP levels but not less antihypertensive meds and lost kidney function. The latter two patients had transplant kidney biopsies after nephrectomy showing chronic changes without acute rejection.

### 4. Conclusion

Hypertension is not uncommon in patients after kidney or kidney-pancreas transplantation. Severe refractory hypertension is an uncommon but can cause serious post transplant complications which can lead to decrease kidney graft and patient survival. These patients must have careful evaluation to exclude treatable causes such as salt abuse, transplant renal artery stenosis, adenoma tumors, and medication nonadherence. Aggressive medical management must always be tried but when severe hypertension persists despite 3 or more antihypertensive medications including diuretics, calcium blockers, and angiotensin receptor inhibitors/angiotensin receptor blockers, bilateral native nephrectomy should be considered in these patients.

Our results confirm that bilateral nephrectomy is beneficial in improving refractory severe hypertension. It appears that patients with better baseline allograft function receive the most benefit. The worse the allograft function at the time of bilateral nephrectomy the less likely renal function will remain stable and the number of antihypertensive medications can be reduced.

We acknowledge our study is small, but with multiple and newer powerful antihypertensive medications only a few patients are likely to require bilateral nephrectomy. It should however be considered in appropriate patients earlier rather than later prior to significant decrease in allograft function.

### Conflicts of interest

The authors declare that they have no conflict of interest.

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### Ethical approval

Not applicable.

### Consent

Not applicable.
Author contribution

Corresponding author wrote the paper. Second author performed the surgery. Third author helped in data collection.

Guarantor

Mark Lerman, MD.

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References

[1] S.L. Cohen, Hypertension in renal transplant recipients; role of bilateral nephrectomy, Br. Med. J. 3 (July (5871)) (1973) 78–81, 14.

[2] D.B. Lee, R.M. Ehrlich, N. Dabir-Vaziri, M.P. Sambhi, R.B. Doud, L. Barajas, R.G. Schultz, Post-transplant hypertension. Nororeninemic severe hypertension treated by bilateral nephrectomies, Urology 9 (April (4)) (1977) 425–428.

[3] J.J. Curtis, B.A. Glucose, T.A. Kotchen, R.G. Luke, Surgical therapy for persistent hypertension after renal transplantation, Transplantation (February (3192)) (1981) 125–128.

[4] M.A. Castaneda, P.J. Garvin, J.E. Codd, K. Carney, selective posttransplantation bilateral native nephrectomy. Indications and results, Arch. Surg. 118 (October (10)) (1983) 1194–1196.

[5] L. Fricke, C. Doehn, J. Steinhoff, K. Sack, D. Jocham, P. Fornara, Treatment of post transplant hypertension by laparoscopic bilateral nephrectomy? Transplantation 65 (May (9)) (1998) 1182–1187.

[6] P. Fornara, C. Doehn, L. Fricke, C. Durek, G. Thyssen, D. Jocham, Laparoscopic bilateral nephrectomy: results in 11 renal transplant patients, J. Urol. 157 (February (2)) (1997) 445–449.

[7] A.E.A. Gawish, T. Donia, T. Fathi, M. Al-Mousawi, M. Samham, It takes time after bilateral nephrectomy for better control of resistant hypertension and renal transplant patients, Transplant. Proc. 42 (2010) 1682–1684.