Canine Renal Transplantation

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Renal transplantation in the dog has been performed since the early 1900’s. The technical aspects of the surgery are well understood. Lack of clinical success in the canine patient with renal failure has stemmed from two major problems. The genetic diversity of the dog along with a marked immune response to a kidney from an unrelated donor makes rejection a serious problem. We have attempted to overcome this rejection response with potent immunosuppressive drugs. While effective in reducing rejection, the canine patient becomes more susceptible to severe and life-threatening infection.

The canine patient in chronic renal failure is also more fragile than our feline patients. They are much more subject to gastrointestinal upset and ulceration. Prolonged malnutrition can result in re-feeding syndrome after successful transplantation. Chronic anemia requires significant amounts of blood products. Canine patients are subject to thromboembolism and intestinal intussusception at the time of surgery. We have performed too few cases to have reliable statistics on morbidity or survival. With my current experience in clinical renal transplantation, I still consider canine renal transplantation as in the developmental or experimental phase. While most canine transplant patients have died within the first year of transplantation, we have had a few dogs that have survived for 3 to 8 years. With strict selection criteria, I will still only give a 50% chance for survival at one year. As with all transplant patients, the canine renal transplant patient requires careful observation and frequent examinations by the referring veterinarian. Blood concentrations of the immunosuppressive drugs and blood cell counts and serum chemistry panels have to be performed regularly. The canine renal transplant patient requires a tremendous commitment of time, energy and money.

With the problems of rejection and infection, I will perform renal transplantation only in canine patients that have a tissue-matched donor. The donor must be the same body size or larger than the recipient, and less than 6 years of age. Tests that must be performed on the donor prior to surgery include:

1. Physical examination
2. Complete Blood Count
3. Serum Chemistry Panel
4. Urinalysis
5. Histocompatibility and blood cross matching panels
6. Urine culture and sensitivity testing
7. Toxoplasmosis titers
8. Heartworm antigen testing
9. Thoracic radiographs
10. Abdominal ultrasound examination
11. Vaccination for Bordetella
If the first four tests show no abnormalities, blood can be submitted for both donor and recipient to Midwest Animal Blood Services, Inc (517-851-8244) for histocompatibility and blood cross matching panels. Owners of the transplant candidate have to find a donor for their dog. Donor dogs have very low morbidity and can be expected to live a normal life span. They do require careful monitoring of their renal function and should be tested annually.

Candidates for canine renal transplantation need to be in early decompensated renal failure. Dogs that are severely debilitated have a high mortality rate after surgery. If the blood urea nitrogen concentration is consistently above 100 mg/dl, dialysis will have to be performed prior to surgery. We cooperate with the UC Davis Dialysis service and the Animal Medical Center, New York City, for this service.

Tests that need to be performed for canine renal transplant candidates include:

1. Complete blood count
2. Serum chemistry panel
3. Urinalysis
4. Urine culture and sensitivity testing
5. Urine protein/creatinine ratio
6. Free T4 level
7. Thoracic radiographs
8. Echocardiogram
9. Abdominal ultrasound
10. Toxoplasmosis titers
11. Heartworm antigen
12. Coagulation panel
13. Blood pressure measurements
14. Vaccination for Bordetella

The cost for renal transplantation at PetCare is $15,000 to $20,000. If the recipient requires prolonged hospitalization, the cost may increase by $5000 to $10,000. It is difficult to estimate the cost of immunosuppressive drugs after surgery. At current prices for a 30 Kg dog, cyclosporine would be expected to cost $1900-$3800/month. Leflunomide would be expected to cost $90-$180/month. Examinations, drug concentration tests, and renal function tests are performed weekly, following discharge, at the referring veterinary hospital. The period between examinations are extended to every 3 to 4 months if the patient’s renal function is stable. Assays for cyclosporine cost $100 - $150 per sample.

Often candidates for transplantation live far from Santa Rosa. If the proper facilities exist, our surgical team will travel to perform canine renal transplantation. Cost will depend on location and time involved.

If you have questions about canine renal transplantation for your client or pet, please contact Dr. Clare Gregory, Dr. Gil Robello, or Dr. Kent Talcott at PetCare.