Key points

- Renal transplantation is a viable treatment option for cats in renal failure
- Identification of risk factors is important in decreasing the morbidity and mortality in this patient population
- Objective information is needed for a number of grey areas including cats with echocardiographic abnormalities, hyperthyroidism, diabetes, inflammatory bowel disease and cats with upper respiratory infections

Renal transplantation continues to remain a viable treatment option for cats with early decompensated chronic kidney disease or irreversible acute renal failure. In a study comparing survival time of cats that had undergone a renal transplant to a control population of cats treated medically, renal transplantation appeared to prolong survival time and quality of life compared with the medical management of the disease. It is estimated that between 400-500 cases of feline renal transplantation have been performed at a few limited centers around the country. Although there is not a retrospective study encompassing all of the cases that have been performed to date, both published and unpublished information from different centers suggests that survival to discharge and long term survival is improving and this is likely related to more stringent case selection, surgical experience, as well as the clinician’s ability to better recognize early on and treat successfully, both peri-operative as well as long term complications.

Current screening of the feline renal transplant recipient is extremely thorough and involves various laboratory tests (complete blood count/chemistry/blood type and cross-match/thyroid evaluation), evaluation of the urinary tract (urinalysis, urine culture, urine protein/Cr ratio, abdominal radiographs, abdominal ultrasound), evaluation for cardiovascular disease (thoracic radiography, electrocardiography, echocardiography, blood pressure), and screening for infectious disease (FeLV/FIV, Toxoplasma titer, IgG and IgM). Based on historical experience, patients with recurrent urinary tract infections that have failed a cyclosporine challenge, cats that are FeLV positive or have an active FIV infection, and those with underlying neoplasia are declined as candidates for the procedure.

Limited information still exists regarding risk factors associated with morbidity and mortality in these patients. The degree of azotemia, anemia, urine specific gravity and age, do not determine, by themselves, a suitable patient for transplantation; however, some of these factors have been associated with survival. In three separate studies, recipient age was identified as a factor associated with survival after discharge. The degree of azotemia prior to transplantation was also found to be a risk factor in one study; in a second study, the level of azotemia was not related to long term survival, but did significantly increase the risk of neurologic complications in the perioperative period. Preoperative blood pressure (BP), duration of anesthesia and weight have also been shown to influence overall survival.

Objective information is needed for a number of grey areas including cats with echocardiographic abnormalities, hyperthyroidism, diabetes, inflammatory bowel disease, and cats with upper respiratory infections. Additionally, the question regarding the appropriate nutritional status for these patients comes up repeatedly. Historically, because of complications
associated with transplanting cats with hypertrophic cardiomyopathy, any cat with underlying heart disease was rejected as a potential recipient. In a study evaluating cardiac abnormalities in 84 potential transplant recipients, only 22% were found to have a normal heart on echocardiographic examination. Common abnormalities identified included both papillary muscle and septal muscle hypertrophy and it was suggested that these changes may be related to hypertension, chronic uremia, age or early changes of hypertrophic cardiomyopathy. Similar findings have been identified in an ongoing study at our facility evaluating 127 feline renal transplant recipients. Many of these patients are intolerant to parenteral fluid therapy or have early signs of congestive heart failure prior to surgery. Following successful transplantation, fluid therapy could be reinitiated without complication. The clinical significance of these echocardiographic lesions remains to be determined. Additionally, cats with unregulated hyperthyroidism, upper respiratory infections, as well as cats with inflammatory bowel disease have also been transplanted successfully.

Complications that still challenge the clinician include those associated with the allograft and those associated with chronic immunosuppressive therapy. Renal complications following transplantation in the cat have included vascular pedical complications, acute and chronic rejection, calcium oxalate (CaOx) nephrosis, ureteral complications including retroperitoneal fibrosis, delayed graft function, hemolytic uremic syndrome and allograft rupture. Complications secondary to chronic immunosuppressive therapy include the development of infections (including opportunistic infections), diabetes mellitus (DM), and neoplasia. Toxoplasma gondii seropositive cats remain acceptable candidates for renal transplantation, but should receive lifelong prophylactic chemotherapeutics to prevent fatal clinical infections. In 2 separate studies, the incidence of post-transplantation malignant neoplasia (PTMN) was 22% (24 of 109) and 24% (11 of 45) with lymphoma being the most common diagnosis in both studies. No risk factors were identified in either study. In one study, all lymphomas were classified as mid to high grade, diffuse large B cell lymphomas, which is also the most common lymphoma subtype in human cases of PTMN.

Renal transplantation offers a unique method of treatment for renal failure in cats. Results in cats are encouraging and transplantation does appear to prolong the life expectancy in cats with end stage renal disease. Based on both published and unpublished reports, 70-92% of cats have been discharged from the hospital following transplantation and median survival times have ranged from 360-613 days. Current information available suggests that survival times following discharge are improving. Continued clinical experience with short and long term management, as well as the ability to identify specific risk factors both pre and postoperatively will hopefully continue to improve long term outcome in these patients.

References:
8. Holmes E, Donahue A, Aronson LR. Neoplasia prevalence in renal transplant cats. Accepted for podium presentation at the 2011 ACVS Veterinary Symposium