

# Unilateral Nephrectomy for Treatment of Renal Disease in Cattle

**David E Anderson, DVM, MS; Lowell T Midla, VMD, MS;**  
**André Desrochers, DVM, MS; D Michael Rings, DVM, MS;**  
**Bruce L Hull, DVM, MS; Guy St-Jean, DVM, MS; Marie Babkine, DVM**  
*Department of Veterinary Clinical Sciences (Anderson, Midla, Rings, Hull),  
The Ohio State University, Columbus, Ohio; College of Veterinary Medicine  
(Desrochers, Babkine), University of Montreal, Saint Hyacinthe, Quebec;  
Department of Clinical Sciences (St-Jean), Kansas State University, Manhattan, Kansas*

## Introduction

Renal disease is occasionally diagnosed in cattle, is usually bilateral and medical therapy the treatment of choice. Nephrectomy may be performed in selected cases where a single kidney primarily is involved. We hypothesized that unilateral nephrectomy can be performed successfully in affected cattle and that these cattle can remain productive members of the herd. The purpose of this retrospective study was to examine medical records of cattle having unilateral nephrectomy and determine survival and productivity in affected cattle.

## Materials and Methods

A computer assisted search was performed of medical records entered into the veterinary medical database between 1984 and 1993. Further, a search of medical records was performed at three Veterinary Teaching Hospitals and these records retrieved for analysis of case management data.

## Results

Twenty-one cattle had nephrectomy performed out of 94,569 individual cattle admissions (case morbidity rate of 2.2 cattle per 10,000 cattle admissions). Of these cattle, 19 were cows and 2 were bulls. Ten cows and 2 bulls were between 2 and 7 years old when the nephrectomy was performed; 3 cattle were < 6 months old, 4 were 6 months to 2 years old, and 2 were of unknown age. Seventeen cattle were Holsteins and 4 were beef cattle. Individual medical records were examined for 17 cattle. Of these, 12 were Holstein, 3 Ayrshire, 1 Beefmaster, and 1 Simmental; 14 were cows and 3 were

bulls; the mean age was 3.5 years (13 were 2 to 9 years old, 3 were < 6 months, and 1 unknown). Cattle were presented for examination because of decreased appetite (n = 9), poor milk production (n = 5), weight loss (n = 4), diarrhea (n = 3), pyuria (n = 3), infertility (n = 2), lethargy (n = 2), pollakiuria (n = 2), hematuria (n = 2), swelling of the rear limbs (n = 1), abdominal distention (n = 1), and mastitis (n = 1). Eight lactating dairy cows were a mean of 100 days in milk. Affected cattle had a mean rectal temperature of 38.8 C, mean heart rate of 91 beats per minute, and mean respiratory rate of 40 breaths per minute. Rectal examination revealed an enlarged left kidney in 10 of 14 adult cattle and an enlarged ureter in 2 of 14 adult cattle. Hematology revealed that affected cattle had a mild leukocytosis (mean 11,593 wbc/ul) characterized by a neutrophil; lymphocyte reversal (7,100 pmn/ul:4,100 lymphs/ul). Cattle with pyelonephritis also had hyperfibrinogenemia (mean 733 mg/dl). Biochemistry analysis revealed serum creatinine mean 3 mg/dl, BUN mean 30 mg/dl, potassium mean 4.7 mEq/l, serum protein 7.8 g/dl, and plasma protein 8.5 g/dl. Urinalysis revealed a mean specific gravity = 1.015, pH = 8, proteinuria, hematuria and pyuria, and bacteria were seen in the urine of 7 cattle. Culture of the urine of affected kidney yielded *Corynebacterium renale* (n = 2), *E coli* (n = 2), *Actinomyces pyogenes* (n = 2), *Proteus sp* (n = 2). Both kidneys were involved in 6 cattle, the left kidney in 5 cattle, and the right kidney in 5 cattle.

Nephrectomy was performed via a standing paralumbar fossae approach in 13 cattle, paralumbar approach under general anesthesia in 3 cattle, and via paramedian incision under general anesthesia in 1 cow. The affected kidney was removed from 9 cattle via right paralumbar fossae (n = 11), via left paralumbar fossae

(n = 1), by combination right and left paralumbar fossae (n = 4), and via a paramedian incision in 1 cow. One cow died because of severe post operative hemorrhage, two cattle were euthanatized because of renal failure in the remaining kidney, and 14 cattle (82%) were discharged from the hospital.

Follow-up information was available for 6 cattle. One beef cow had 6 calves, two dairy cows were lactating at an average level of production for the herd (2 years post-op), one dairy cow was culled because of lower (30 kgs/day) than average production (6 months post-op), one bull calf was smaller than age matched bull calves (5 months post-op), and one cow was eating approximately 75% of her normal dry matter intake (21 days post-op).

## Discussion

Unilateral nephrectomy is a useful treatment for renal disease in cattle where one kidney is principally involved. Removal of the worst affected kidney was successful in 3 of 6 cattle with bilateral renal disease. Affected cattle may return to acceptable levels of productivity, but clients should be aware that performance may be suboptimal.

## Conclusion

Unilateral nephrectomy is warranted for treatment of affected cattle of perceived high economic value based on the high success rate determined in this study.