

## Nephro-cutaneous fistula in a dog

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### ABSTRACT

Nephro-cutaneous fistula, although reported in humans, has not been reported in the dog. In humans the majority of cases develop in patients with a history of previous renal surgery, renal trauma, renal tumours, or chronic urinary tract infection with abscess formation. The dog in this report developed a nephro-cutaneous fistula secondary to a traumatic induced renal abscess with formation of a draining sinus tract to the exterior of the body. The animal underwent simple nephrectomy, which resulted in complete resolution of the fistula.

**Key words:** canine, kidney, nephrectomy, sinus tract.

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### INTRODUCTION

Nephro-cutaneous fistulas usually occur as complications of surgical procedures on the kidney, renal trauma (penetrating or iatrogenic), renal uroliths, tumours and chronic urinary tract infections with formation of peri-renal abscesses<sup>1,3,6</sup>. Peri-renal abscesses can develop either from organs adjacent to the kidney or from the kidney itself. An abscess usually develops by extension of a urinary tract infection to the adjacent tissues, either by contiguity or by lymphatic route. Alternatively, abscesses can originate from an urinoma or urinary pseudocyst, which arise as result of external or surgical trauma to the kidney, promoting loss of continuity between it and the surrounding tissues<sup>4</sup>. A purulent discharge may be present at the cutaneous site of the fistula<sup>5</sup>.

In humans, spontaneous renal fistula to adjacent organs is not an uncommon phenomenon. However, the spontaneous communication between kidney and skin is rare and few cases are described in the literature<sup>2,3,4,5</sup>. The majority of cases reported in the medical literature are associated with chronic urinary tract infection secondary to renal stones<sup>2,3,4,5</sup>. Fistulas can develop between the kidney and the pleural cavity, lungs and bronchia, bowel, and skin. The latter are, however, rare, and whenever they occur, they typically involve patients with a past history of renal surgery<sup>2,3</sup>. The majority of fistulas present with spontaneous drainage through the lumbar region following those points with lowest resistance such

as the lumbar triangle and the lumbar quadrilateral, establishing a fistulous pathway that communicates the perirenal tissues and collecting system with the external environment<sup>1,3</sup>.

In humans, therapeutic approaches are based on renal function and on the patient's ability to tolerate a surgical procedure and can include total nephrectomy, partial nephrectomy or antibiotic therapy<sup>2,5</sup>. Surgical removal of the affected kidney results in satisfactory resolution of the fistula<sup>1</sup>.

To the authors' knowledge this is the 1st report of a nephro-cutaneous fistula in the dog.

### CASE HISTORY

A 1-year-old, intact male maltese cross was referred for evaluation of recurrent abscess formation with a draining sinus tract in the right flank. At 4 months of age the animal had been in a motor vehicle accident, which had resulted in a right femur fracture, luxation of the right hip, and severe soft tissue injury in the right flank. The fractured femur and luxated hip were surgically corrected and the dog recovered uneventfully. Over the following 6 months, however, the dog developed a recurrent right flank draining sinus tract, which was managed by means of surgical drainage and antibiotic therapy. *Pseudomonas aeruginosa* was cultured from the area on 2 occasions.

On clinical examination the dog was bright and alert, rectal temperature was normal, and a draining sinus tract was present in the right flank. On abdominal ultrasonography a fluid-filled anechoic structure in the right mid-to-caudal abdomen was evident below the draining

sinus tract. The right kidney could not be identified and the left kidney was enlarged. Purulent material was aspirated from the fluid-filled structure. Cytology of the fluid showed necrotic cells, degenerative neutrophils and macrophages. Full urine analysis was within normal limits. On exploratory laparotomy the right kidney was observed to be reduced to a thickened capsule containing purulent material, which was communicating with the draining sinus tract in the right body wall. The right kidney, ureter, and sinus tract were completely excised. Histopathology confirmed renal tissue with metaplastic ossification and a pyogranulomatous inflammatory reaction.

The animal made an uneventful recovery from surgery and 11 months after the nephrectomy there has been no further sinus tract formation. On a telephonic report the owner reported that the dog was clinically well and has shown no evidence of renal disease (polyuria, polydipsia, or weight loss).

### DISCUSSION

Nephro-cutaneous fistula in humans is a rare condition and to the authors knowledge this is the 1st report in the dog. In humans, nephro-cutaneous fistula is associated with chronic urinary tract infection and nephrolithiasis<sup>1</sup>, often secondary to trauma. In this case it is most likely that the nephro-cutaneous fistula was secondary to a renal abscess that arose as a result of external trauma to the kidney that occurred when the dog was hit by a car. A draining sinus tract to the exterior of the body subsequently developed. An infectious process was demonstrated by means of repeated bacterial culture. In this dog, evaluation of renal function was not undertaken as there were no clinical signs of compromised renal function and urine analysis was within normal limits.

In this case the diagnosis was suspected on the basis of ultrasonography – the presence of an anechoic fluid-filled structure in the region of the right kidney and under the draining sinus tract, absence of the right kidney, and enlargement of the left kidney. The latter was ascribed to compensatory hypertrophy. In humans the diagnosis is based on CT enhanced

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with contrast material and/or a sonogram, as the affected kidney is often non-functional<sup>6</sup>. The use of MRI sinography has also been reported<sup>6</sup>.

As in humans<sup>1</sup>, surgical removal of the affected kidney resulted in complete resolution of the fistula in this dog.

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