

Case Report Rapport de cas

Hypertrophic osteopathy associated with renal pelvis transitional cell carcinoma in a dog

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Abstract — A 6-year-old male, Belgian shepherd dog was presented with lethargy, oliguria, hematuria, and reluctance to move. The dog developed hypertrophic osteopathy secondary to renal pelvis transitional cell carcinoma. A nephrectomy was performed and after a year, the dog was completely asymptomatic, and no evidence of metastatic disease was present.

Résumé — **Ostéopathie hypertrophique associée à un carcinome de type transitionnel du pelvis rénal chez un chien.** Un Berger belge mâle âgé de 6 ans a été présenté pour léthargie, oligurie, hématurie et manque d'empressement à bouger. Le chien a développé une ostéopathie hypertrophique consécutive à un carcinome de type transitionnel du pelvis rénal. Un an après une néphrectomie, l'animal était totalement asymptomatique et aucun signe de métastases n'était visible.

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A 6-year-old, male, Belgian shepherd dog, weighing 30.7 kg, was referred to the Small Animal Surgery Department of São Paulo State University for evaluation of lethargy, oliguria, hematuria, reluctance to move, and dyspnea when walking. Three months before referral, an episode of hematochezia and diarrhea was observed. Antimicrobial therapy with doxycycline, 10 mg/kg body weight (BW), PO, q24h, had been given for 20 d before referral, with no clinical improvement. The dog had lost weight despite having a normal appetite.

Case description

On physical examination, the dog was very thin and moderately dehydrated. On palpation, diffuse pain and swelling was noted over all the carpi, tarsi, metacarpi, and metatarsi. Rectal temperature was 39.2°C, heart rate 104 beats/min, and respiratory rate 48 breaths/min. Thoracic auscultation and mucous membranes were normal. There were no abnormal findings on abdominal palpation.

Thoracic radiographs showed a predominantly interstitial pattern with no evidence of pulmonary neoplasia. Radiographs of

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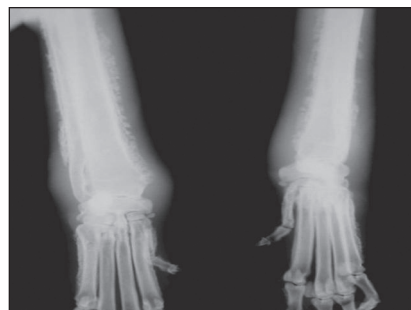


Figure 1. Radiographic view of the thoracic limbs before treatment showing periosteal reaction without underlying bone destruction of the distal portion of radius/ulna.

the abdominal region appeared normal. Radiographs of all limbs showed periosteal reaction without bone destruction, mainly on the distal portions of the tibia/fibula and the radius/ulna, extending distad to the phalanges (Figure 1).

Abdominal ultrasonographs showed an irregular and hyperechoic mass (approximately 3.3 × 2.4 cm) in the renal medulla of the caudal pole of the left kidney. The other abdominal organs appeared normal.

Results from a complete blood (cell) count (CBC) were within normal limits. Results of a urinalysis indicated a normal specific gravity, but the presence of hematuria, bilirubinuria (+), and proteinuria (+). The urinary sediment contained a large number of leukocytes and red blood cells, as well as rare renal medullary and pelvic epithelial cells. Results from a serum biochemical evaluation were normal.

After premedication with morphine (Dimorf; Cristália, Itapira, Brazil), 0.1 mg/kg BW, and acepromazine (Aceprom;

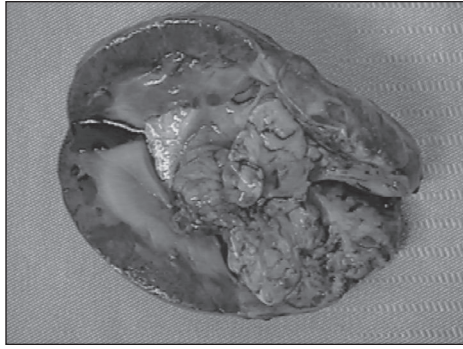


Figure 2. View of the left kidney with a granular and friable mass localized in the renal pelvis causing dilation.

Univet, São Paulo, Brazil), 0.05 mg/kg BW, IM, anesthesia was induced with propofol (Propovan; Cristália, Itapira, Brazil), 4 mg/kg BW, IV, and maintained with isoflurane in oxygen (Isothane; Baxter, Guayama, Puerto Rico). An exploratory laparotomy revealed an enlarged left kidney with a dilated renal pelvis. Following nephrectomy, there was no gross evidence of metastasis to lymph nodes.

Gross pathological examination of the left kidney ($9 \times 5.5 \times 5$ cm) revealed a yellow capsular surface, with a granular and friable tumoral mass ($4 \times 2 \times 2$ cm) localized in the renal pelvis, causing its dilation (Figure 2).

Histologically, the tumor mass consisted of sheets of rounded cells with a large eosinophilic cytoplasm and pleomorphic nuclei with prominent nucleoli. The proliferative rate was of 4–5 mitosis per high ($400\times$) field. Based on these histological findings, the diagnosis was a renal pelvis transitional cell carcinoma.

Six months postoperatively, the dog showed marked clinical improvement. There was no pain in the limbs. After a year, the dog was completely without clinical signs. Results from a CBC, urinalysis, and serum biochemical evaluation were within normal limits. There was no evidence of metastatic on thoracic and abdominal radiographs, or on abdominal ultrasonographs. The results from urinary cytologic examination were normal.

In the present study, the animal was in good clinical health even 12 mo after surgery.

Discussion

Hypertrophic osteopathy, which is characterized by firm swelling of the distal portion of all 4 limbs, which are warm to the touch and sometimes painful when palpated (1), is a secondary pathologic process (1) or paraneoplastic syndrome, generally associated with thoracic diseases (2) or, infrequently, primary extrathoracic tumors, such as nephroblastoma of the kidney (3,6) and rhabdomyosarcoma or carcinoma of the bladder (4,5).

Primary renal tumors are rare in dogs, accounting for only 0.6% to 1.7% of all reported neoplasms (6). They are separated into groups according to their tissue of origin. Epithelial tumors, like renal carcinomas, are seen in male dogs of advanced age (6,7).

Dogs with renal tumors frequently have a history of a palpable abdominal mass, weight loss, depression, anorexia, and, occasionally, hematuria (6). In this case, the abdominal mass was not palpated, probably due to its localization in the renal



Figure 3. Radiographic view of the thoracic limbs 12 months after surgery showing a decrease in the periosteal reaction.

pelvis; this clinical sign has been reported as not present in up to 42% of renal neoplasms in dogs (6).

The pathogenesis of hypertrophic osteopathy is not completely understood and, in fact, may be multifactorial (8,9). The most widely accepted theory is that the periosteal reaction is due to an increased blood flow to the distal part of the limbs because of a neural reflex (1,10,11) and also to peripheral vasodilation caused by the primary disease (11). The disease is initially characterized by fibrous, vascularized, collagenous connective tissue, fibrochondroid metaplasia (3,10,11), and, finally, new bone production subperiosteally (1,3,10).

The vagus nerve is responsible for mediation of the neural reflex. Irritation of the afferent pathways involved with the primary lesion may stimulate this reflex (1).

The treatment of choice is removal of the underlying disease. The prognosis depends on the elimination of the primary lesion with surgery or medical treatment (1). In dogs with renal carcinoma, the prognosis is poor when the tumor is metastatic, bilateral, or locally invasive at the time of diagnosis. However, studies have reported survival times up to 4 y after surgical excision of a unilateral malignant renal neoplasm (6,8).

In a study of 54 dogs with a renal neoplasm, 5 dogs were diagnosed with renal cell transitional carcinomas. Of these, 2 were euthanized at surgery, 1 at 3 mo postoperatively, and 1 at 5 mo postoperatively (6). Necropsy of these 4 dogs showed abdominal and pulmonary metastases in all 4 of these dogs. Regional lymph node involvement was seen in 1 dog, and bilateral involvement of the kidneys in another. One dog survived for at least 25 mo postoperatively; it was still alive when the study was completed (6).

Primary renal tumors present a poor prognosis with high level of mortality (6). They may be presented with hypertrophic osteopathy. Nephrectomy is an important therapeutic option in these cases, increasing survival and improving quality of life for the affected animals.

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Answers to Quiz Corner

Les réponses du test éclair



1. c) The history and clinical signs are most consistent with polyomaviral infection.
c) L'anamnèse et les signes cliniques sont compatibles avec une infection à polyomavirus.
2. b) Female hamsters placed together as adults frequently fight.
b) Les femelles hamsters adultes gardées ensemble se battent fréquemment.
3. d) *Corynebacterium pseudotuberculosis* is the most common of caseous lymphadenitis in goats, though there are other causes.
d) *Corynebacterium pseudotuberculosis* est la bactérie la plus commune de la lymphadénite caséuse chez la chèvre, quoiqu'il puisse y avoir d'autres causes.
4. b) Ergotism from ingestion of *Claviceps purpurea* causes gangrene of the feet in cattle.
b) L'ergotisme à la suite de l'ingestion de *claviceps purpurea* cause la gangrène des pieds, chez les bovins.
5. e) These are characteristic of swine influenza.
e) Cette description est caractéristique de l'influenza du porc.
6. a) The auriculopalpebral branch of the facial nerve supplies motor innervation to the orbicularis oculi. The other nerves are sensory.
a) La branche auriculopalpebrale du nerf facial fournit l'innervation motrice au muscle orbiculaire de l'œil. Les autres nerfs sont sensitifs.
7. c) Hypothyroidism is commonly associated with subfertility or infertility.
c) L'hypothyroïdisme est communément associé à la subfertilité ou à l'infertilité.
8. a) Pelger-Huët anomaly is an inherited disorder associated with abnormal neutrophil segmentation.
a) L'anomalie de Pelger-Huët est un trouble héréditaire associé à la segmentation anormale des neutrophiles.
9. b) Corticosteroids cause hepatomegaly and elevated serum alkaline phosphatase activity.
b) Les corticostéroïdes causent de l'hépatomégalie et une élévation de l'activité de la phosphatase alcaline sérique.
10. a) Cholecystokinin, along with secretin, is released into the blood when acid and partly digested food from the stomach enter the duodenum, stimulating secretion of pancreatic juice.
a) La cholécystokine, avec la sécrétine, est libérée dans la circulation sanguine lorsque l'acide et la nourriture partiellement digérée provenant de l'estomac entrent dans le duodénum, stimulant ainsi la sécrétion du suc pancréatique.