Metastasis of Squamous Cell Carcinoma in the Pelvis of a Dog

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ABSTRACT

Background: Squamous cell carcinoma (SCC) is regarded as one of the most common diagnoses in lesions of the digit, should be included in the differential diagnosis of lesions of the digit, and seems to exhibit a distinct behavior. Metastases in bone tissue are rare. Bones such as tibia, ulna and vertebrae have been reported as carcinoma metastasis sites. However, no reports of carcinoma metastasis in pelvic bones of dogs are available. This report aims at describing a case of distant and unusual metastasis of squamous cell carcinoma in the pelvis of a dog after an attempt of surgical resection of the primary lesion in the digit.

Case: A six-year-old male Rottweiler dog was referred to the Veterinary Hospital of the Faculdade de Ciências Agrárias e Veterinárias, Universidade Estadual Paulista, Jaboticabal, Brazil, with a history of a non-healing lesion on the distal medial aspect of the left thoracic limb after amputation of the first digit, which had been performed four months earlier owing to the same problem. Surgical excision of the lesion was performed followed by wound treatment aimed at healing by second intention as an attempt to preserve the limb. Histological analysis revealed a diagnosis of squamous cell carcinoma. There was recurrence of the lesion presented as circular areas with differentiated hemorrhagic tissue amidst the granulation tissue. Another excisional biopsy confirmed squamous cell carcinoma recurrence. After that, the affected limb was amputated with a good recovery. Three months later, the patient was presented with lameness in the left pelvic limb and severe pain in the hip region. Radiographic examination revealed intense periosteal reaction in the body of the left ilium extending to the left sacroiliac joint. Incisional biopsy revealed squamous cell carcinoma metastasis. Due to the clinical presentation, the patient was euthanized and subjected to necropsy. The spleen and lung also exhibited metastatic nodules not detected on previous radiographic examination.

Discussion: Squamous cell carcinoma (SCC) is the most common diagnosis in lesions of the digit and this occurrence in Rottweilers is common. Surgical intervention is still the treatment of choice for tumors of the digit. The occurrence of metastases in this patient might be related to the delay in opting for amputation. It has been suggested that the occurrence of metastasis in SCC of the digit is more likely to happen as compared to other parts of the body, but it is not clear why these lesions exhibit a distinct behavior. There are reports of carcinoma metastasis in pelvic bones; however, the primary site was not the digit. The occurrence of this type of bone metastasis is rare and, the few reports found in the literature describe it mostly in the axial skeleton in humans, which is different from what was observed in the case reported here. The most affected sites for metastasis of tumors of epithelial origin are the humerus, femur and spine. SCC should always be considered in the differential diagnosis of lesions of the digit due to its capacity to form metastasis in distant sites. Metastasis can occur in uncommon and less likely sites, such as pelvic bones. After definitive diagnosis, an aggressive treatment is recommended as an attempt to avoid additional complications. Further studies should be conducted with the aim of establishing alternative treatments and management procedures for these patients.

Keywords: squamous cell carcinoma, dog, metastasis, pelvis.
INTRODUCTION

Squamous cell carcinoma (SCC) is regarded as one of the most common diagnosis in lesions of the digit [6]. Rottweiler is reported as one of the most affected breeds [16]; large-breed, and dark-skinned dogs are also predisposed to develop SCC [6].

In the veterinary literature, metastatic rates of SCC of the digits vary from 4.7% [5] to 24.1% [15] and are more likely to happen as compared to other parts of the body. Several bones such as tibia, ulna, and vertebrae have been reported as carcinoma metastasis sites [3], however, no reports of carcinoma metastasis in pelvic bones of dogs are available. This report aims at describing a case of distant and unusual metastasis of squamous cell carcinoma in the pelvis of a dog after attempt surgical resection the primary lesion in digit.

CASE

A six-year-old male Rottweiler dog was presented to the Veterinary Hospital of the Faculdade de Ciências Agrárias e Veterinárias, Universidade Estadual Paulista, Jaboticabal, Brazil, with a history of a non-healing lesion (Figure 1) on the distal medial aspect of the left thoracic limb after amputation of the first digit, which had been performed four months earlier owing to the same problem. The lesion exhibited a raised exuberant tissue with irregular surface measuring approximately 5 cm in length by 3 cm in width with secondary bacterial infection. Various topical or local treatments had been used to no avail.

The patient was referred for biopsy, culture and sensitivity test of the affected site. Results revealed keratinized squamous cell carcinoma with bacterial contamination. Survey radiographs revealed absence of first digit (Figure 2) and soft tissue swelling. The lesion was surgically removed as an attempt to preserve the limb. For this purpose, a large incision was performed, followed by wound treatment aimed at healing by second intention.

Granulation tissue at the wound site was evident and exhibited rapid growth; however, circular areas with differentiated hemorrhagic tissue (Figure 3) were also present amidst the granulation tissue. Another excisional biopsy was performed, which confirmed squamous cell carcinoma recurrence. Consequently, amputation of the left thoracic limb was indicated and successfully performed. The patient made a good recovery and adapted well after the procedure.

Three months after the procedure, the patient was presented to the Hospital with lameness in the left pelvic limb and severe pain in the hip region. Radiographic examination revealed intense periosteal reaction (Figure 4) in the body of the left ilium extending to the left sacroiliac joint. No evidence of pulmonary metastasis was seen on chest radiographs. The patient was referred for incisional biopsy of the affected pelvic bone, which revealed squamous cell carcinoma metastasis. Due to the patient’s intense pain, euthanasia and necropsy were performed. Pulmonary and spleen metastases were found, even though they were not detected on previous radiographic examination.
Squamous cell carcinoma (SCC) is the most common diagnosis in lesions of the digit [6,11,13,15]. It should be included in the differential diagnosis, especially in cases in which response to treatment is not satisfactory. Independent of the cause, lesions of the digit exhibit similar clinical manifestation in dogs, therefore, histopathological examination should be performed to determine the diagnosis [16]. Melanoma should also be considered in the differential diagnosis. Most tumors of the digit are malignant, and different lesions in the same patient can have different diagnosis [6].

The occurrence of lesions of the digit in Rottweilers is common. Large-breed and dark-skinned dogs have a predisposition to SCC [6,10,14]. Rottweiler is reported as one of the most affected breeds, amongst other breeds as Labrador retriever, Dachshund, Flat-Coated retriever, Standard Poodle [6,10,13,16] and Giant Schnauzers [14]. The reason behind the association between dark skin and higher incidence of SCC of the digit is still not clear, however, lesions in digits of dark-skinned breeds should always be regarded as possibly tumoral [16], similarly to the case described here.

The most evident signs in the case reported here were lameness and ulceration that lasted for several months. These signs and the presence of a mass that may have been evolving for up to some years are the most common signs of SCC [6]. Furthermore, there is a predisposition to the emergence of these lesions on the thoracic limbs in these cases [11]. It has been suggested that the involvement of preferential sites for digital tumors can be associated to weight overload and greater exposure due to the habit of digging [6]. Multiple digits can be involved at the same time in one or more limbs [6,10,11,14]. In the case reported here, digging was not reported by the owner; the patient lived in a cemented area. Additionally, multiple lesions were not seen.

At the follow up appointment, the metastatic disease was already advanced and evident on the pelvic radiograph. Many bone tumors have a trabecular pattern and only exhibit osteolysis, and endosteal and periosteal new bone formation at advanced stages. In these cases, the absence of these bone characteristics can hamper the diagnosis [4].

The choice for local resection was made in agreement with the owner, who did not consent to a more radical procedure, as an attempt to preserve the limb. Dogs with initial stage tumors that are treated with amputation of the digits or limbs have a more favorable prognosis, independent of the occurrence of metastasis, although recurrence in the same area may happen [6]. According to the literature, the survival rate in SCC is one year in 57% of the cases, while only 36% of all the affected animals reach two years [1,11]. Surgical intervention is still the treatment of choice for tumors of the digit; the use of chemotherapy is not frequent and is not clearly defined in the veterinary literature [7]. In the case described here, there was no evidence of metastases in the initial presentation; con-
sequently, an open wound treatment with no associated chemotherapy was chosen. However, the occurrence of metastases in this patient might be related to the delay in opting for amputation.

Metastasis rates in SCC of the digit are variable in the veterinary literature and range from 4.7% [5] to 24.1% [15]. Wobeser et al. (2007) reported a 23.8% rate for metastasis and recurrence in 42 dogs evaluated; of these, 26% either died owing to the illness or were euthanized.

It has been suggested that the occurrence of metastasis in SCC of the digit is more likely to happen as compared to other parts of the body [5], but it is not clear why these lesions exhibit a distinct behavior. There are reports of carcinoma metastasis in pelvic bones; however, the primary site was not the digit [3]. The occurrence of this type of bone metastasis is rare; the few reports found in the literature describe it mostly in the axial skeleton in humans [9,12], which is different from what was observed in the case reported here. The most affected sites for metastasis of tumors of epithelial origin are the humerus, femur and spine [4].

In one study, 21% of tumors of epithelial origin developed bone metastasis [4]. In the same study, only tumors with visceral metastases also exhibited bone involvement. In the case reported here, metastatic foci were present in the viscera (spleen and lung); however, they were only detected at necropsy.

In humans, pelvic bones are the most probable target for secondary bone tumors [8]. The differences are attributed to the biological behavior of tumors, variation in vascular supply, and a hemodynamic network which favors entrapment or extravasation of tumor cells in the red bone marrow [2]. Although the exact mechanism that governs this event is not known, additional reports of the occurrence of pelvic metastasis and further studies can help the understanding of this behavior.

SCC should always be considered in the differential diagnosis of lesions of the digit due to its capacity to form metastasis in distant sites. Metastasis can occur in uncommon and less likely sites, such as pelvic bones. After definitive diagnosis, an aggressive treatment is recommended as an attempt to avoid additional complications. Further studies should be conducted with the aim of establishing alternative treatments and management procedures for these patients.

Declaration of interest. The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

REFERENCES


