Keratoma: A Similar Cause of Lameness

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Based on the clinical findings as well as location and radiographic appearance of the lesion in the accompanying case report, keratoma must be included in the differential diagnosis. Keratomas are benign, keratin-containing, soft tissue masses that develop between the hoof wall and underlying distal phalanx. Keratomas develop from proliferation of cornified tissue on the inside of the hoof wall and commonly originate near the coronary band but can extend to the solar surface of the foot and usually appear near the white line region of the foot.1 They grossly appear as concentric circles of tissue, much like a cross section of an onion (Figure 1). The hoof wall often bulges over the offending mass, or a deviation may be seen at the coronary band. Abnormal hoof growth may be apparent, extending from the coronary band distally, and progress as the keratoma enlarges; however, the hoof wall can also appear normal. The cause is unknown but can be associated with chronic irritation or trauma.2

Clinical signs usually consist of slowly progressive lameness caused by the underlying tissue mass impinging on the sensitive laminae. Lameness may also be caused by disruption of normal hoof growth, allowing secondary bacterial invasion in the area and subsequent recurrent hoof abscession. A painful response to hoof testing can usually be elicited from the hoof wall overlying the keratoma.

Diagnostic peripheral anesthesia should be used to confirm that the foot is the source of lameness. A palmar digital nerve block may improve the lameness, but total desensitization of the foot is needed to resolve the lameness. A 60° dorsopalmar and lateral radiographic view of the distal phalanx may reveal a semicircular bony defect in the margin of the bone, usually located at the toe or quarter region of the foot. This bony defect usually has a smooth contour and minimal sclerosis, which help differentiate it from osteomyelitis of the distal phalanx. The bony defect occurs secondary to pressure-induced bone resorption from the overlying keratoma. This radiographic finding is suggestive of a keratoma; however, other neoplasms of the hoof, such as melanomas or canker, may cause similar radiographic lesions.3,4 A keratoma can still be present in the absence of radiographic abnormalities. In a previous report,5 three of seven horses with keratomas had no radiographic abnormalities. If the keratoma is located near the coronary band or if a coronary band defect is visible, ultrasonography may reveal a focal, hypoechoic, soft tissue mass.6

Figure 1. Concentric circles of keratin in the white line region at the toe of the hoof (arrow).

Figure 2. Surgical method of complete hoof-wall resection over a keratoma (arrow).
Treatment requires surgical removal of the mass from the hoof wall and corium. This can be easily performed while the horse is sedated. Two surgical techniques have been described. The original surgical technique involves complete resection of the hoof wall overlying the keratoma. This is accomplished using a motorized burr or cast-cutting saw to make two parallel cuts through the hoof wall on each side of the keratoma from the coronary band to the distal aspect of the toe. A third cut is made parallel to the coronary band, and a fourth is made distally at the level of the sole. The hoof wall overlying the keratoma is grasped with pincers and elevated to expose the keratoma (Figure 2). It is important to avoid disruption of the coronary band. All abnormal soft tissue and underlying disrupted bone is removed by curettage, the defect is packed with saline-soaked sponges, and the foot is wrapped. The foot must be stabilized with a bar shoe and clips on either side of the defect until the hoof wall has grown out. A small, steel plate is often necessary to stabilize the hoof wall near the coronary band. Although this technique allows the greatest amount of exposure, the subsequent amount of hoof destabilization and long-term convalescence are undesirable.

The other surgical technique uses a Galt trephine hole or small burr to remove a focal area of hoof wall. This technique is preferred because it dramatically shortens the recovery period and is minimally disruptive to the stability of the hoof capsule. Three small steel pellets can be taped to the hoof in a triangular pattern before radiography to determine optimal placement of the trephine hole to access the lesion (Figure 3). A Galt trephine with a retractable pilot bit can be used to access the keratoma (Figure 4), and a second trephine hole can be made near the white line at the bottom of the foot to ensure all abnormal tissue has been removed and to ventrally drain the surgical site. Once the trephine hole in the hoof wall has cornified, that defect can be filled with antibiotic-impregnated polymethyl methacrylate, which should allow the horse to return to performance sooner than would waiting for the hoof defect to grow out.

Once regrowth of the hoof wall is complete, the prognosis for resolution of lameness and return to previous performance is excellent. Recurrence is uncommon unless there was incomplete removal of all abnormal tissue. I have not seen recurrence as a complication of keratoma removal. In one study, six of seven horses with keratomas returned to their intended use.

REFERENCES