**ARTHRODESIS OF THE DIP JOINT**

The techniques for arthrodesis of the DIP joint differ by surgical approach. Choice of a technique should be based on the anatomic structure infected and the location of existing draining tracts. Intact ligaments and tendons should be preserved, when possible, to keep the affected digit stable during the ankylosis procedure.

The advantages of ankylosis of the DIP joint in comparison to digit amputation are that cattle have a longer production life, the outcome is superior for a heavy animal or when the hind lateral or front medial digit is affected, and the healing result is more cosmetic and mechanically more stable. The disadvantages are that it is more expensive and technically demanding, more postoperative care is needed, and cattle have a slower return to previous production because of the pain engendered by the procedure and the long process of ankylosis.

ARTHRODESIS OF THE DIP JOINT BY THE SOLAR APPROACH:

The surgery is performed under sedation and intravenous regional anaesthesia. Cattle are restrained in a foot-trimming chute or in lateral recumbency with the affected leg uppermost. The plantar or palmar portion of the sole and the heel should be pared away until the sole can be indented easily. In severe and extensive infection of the DIP joint that originates from a solar lesion, the distal sesamoid bone and the joint can be felt through the wound and the sole already can be indented easily. The distal limb is prepared aseptically. A horizontal incision that starts 2 cm proximal to the coronary band is made along the plantar or palmar aspect of the second phalanx. The tendinous portion of DDF muscle is cut from its insertion on the distal phalanx and resected proximally at about 2 to 3 inches from its insertion. The distal sesamoid bone is then exposed. If necrotic, it is removed easily with a rongeur. If not, the two collateral ligaments and the distal ligaments are resected with a scalpel blade. The DIP joint then is exposed. Debridement of the joint from the solar wound through the dorsal hoof wall, 1 cm distal to the coronary band, is performed with a 1.3-cm drill bit. The joint is curetted, and copious lavage is performed with isotonic solution. If the tendon sheath or the tendinous portion of the superficial digital flexor muscle is infected and necrotic, the incision is extended 2 to 3 cm proximally to the accessory digit to allow debridement and drainage. Any necrotic tissue at the heel and sole junction is removed. A wooden block is apposed with polymethylmethacrylate on the healthy digit of the affected limb and the claws are wired together with the affected digit in slight flexion. The wound is bandaged, and lavage is performed every other day, if possible. Systemic antibiotics are given for 2 to 3 weeks, and phenylbutazone is given as needed for the first 2 weeks.

This technique provides good visualization of the DIP joint, excellent drainage, and a good long-term prognosis. However, the approach to the joint is difficult. Even if not affected by the septic process, the tendinous portion of the DDF muscle and the distal sesamoid bone—as well as the tendon sheath —must be resected, which can create instability of the joints.

ARTHRODESIS OF THE DIP JOINT BY A DORSAL APPROACH:

Surgery is performed with the cattle sedated and restrained in lateral recumbency. Intravenous regional anaesthesia is administered. The surgical site is prepared aseptically. Two arthrostomies are performed either with a trephine that is 5.56 to 14 mm in diameter or by making a circular incision with a scalpel blade. The first arthrostomy is made into the DIP joint on the dorsal aspect of the digit, 0.5 cm proximal to the coronary band, abaxial or axial to the tendinous portion of the common (forelimb) or long (hindlimb) digital extensor muscles. The second arthrostomy is made 0.5 cm proximal to the coronary band caudal to the abaxial ligament of the DIP joint. When a draining tract communicates with the joint, the tract is enlarged with a trephine if needed, and a second arthrostomy is performed dorsal or palmar. Cartilage and necrotic bone are curetted through the arthrostomy sites. A wooden block with polymethylmethacrylate is placed on the healthy digit of the affected limb. Joint lavage is performed through the arthrostomies daily for 1 week or until the infection is controlled and the swelling is decreased. From the experience of the authors, cattle were slightly lame postoperatively for 4 months. This technique is indicated if the distal sesamoid bone and the tendinous portion of the DDF tendon are not affected. The approach to the joint is easy to perform and less invasive. This technique also provides more stability to the joint because the tendinous portion of the DDF muscle is not disrupted. Limited visibility of the DIP joint surfaces is attained with this surgical approach; therefore, adequate removal of cartilage and necrotic bone is difficult to assess. Drainage is less efficient than with a solar approach.

