Surgical Correction of Intermittent Upward Fixation of the Patella in a Brahman Cow

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Upward fixation of the patella is a syndrome most commonly reported in the horse but also occurs frequently in working bullocks and male buffaloes of India, while calves and cows below two years of age were involved sporadically (1-4). The condition is less frequent in other countries, and is usually seen in dairy cattle late in gestation (5-8). The duration and severity of the lameness increases until the limb becomes rigid with an inability to flex the stifle or hock. A case of bilateral intermittent upward fixation of the patella (IUFP) has not been reported previously outside of India in nonworking cattle.

A four-year-old Brahman cow was admitted to the Veterinary Teaching Hospital of the University of Florida with a history of a left hindlimb lameness of eight months duration. Historically, the left hindlimb lameness had become progressively worse over five months, at which time the right hindlimb also became involved. The lameness in both limbs worsened until the cow calved. At that time, the right hindlimb lameness resolved, but lameness continued in the left hindlimb.

The cow was in good condition, and had normal vital signs at admission. The gait of the left rear limb was abnormal with the limb remaining in extension for a prolonged period as the dorsal aspect of the foot was dragged along the ground while walking (Figure 1A). During the cranial portion of the stride, the limb would jerk dorsally and cranially with the foot at an extremely high arc (Figure 1B). The anterior phase of the stride was shortened. The gait abnormality was present 50-70% of the time at a walk and approximately 30% of the time at a trot. The right rear limb appeared normal.

Palpation of both stifles at rest did not reveal any abnormalities. The temperament of the cow precluded any flexion tests or palpation of the stifle in motion. A diagnosis of IUFP was made based on the signs of hesitation of the stride, dragging of the toe along the ground, and subsequent hyperflexion of the stifle.

The cow was confined in a head chute. The area over the medial and middle patellar ligaments was clipped and prepared aseptically for surgery. Subcutaneous and deep infiltration with 10 mL of 2% mepivacaine-hydrochloride (Carbocaine-V, Winthrop, Sterling Drug, New York, New York 10016) was performed over the medial and middle patellar ligaments close to their insertion on the tibial crest.

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A 3 cm linear incision was made 0.5 cm lateral to the medial patellar ligament near its insertion on the tibial tuberosity. Carmalt forceps were used to bluntly dissect the fascia from underneath the medial patellar ligament. When the forceps could be palpated just under the skin medial to the ligament, they were withdrawn and a blunt-end, curved bistoury was inserted vertically. The bistoury was rotated 90 degrees and the distal aspect of the medial patellar ligament was severed with a short sawing motion. The medial patellar ligament could no longer be palpated under the skin. The skin edges were apposed with #2 monofilament nylon (Ethilon, Ethicon, Inc., Somerville, New Jersey 00876). The cow was released from the chute and walked with a normal stride (Figure 2). Three hours later, just prior to discharge from the hospital, the right rear leg exhibited the same gait abnormality as the left rear leg. The cow was discharged and the owner was instructed to return the cow in two weeks for a medial patellar desmotomy in the right rear limb. The same procedure was performed on the right stifle two weeks later, when the cow was returned for reevaluation. Postoperatively the cow had a normal stride in both rear limbs. Follow-up 25 months postoperatively revealed that the cow has successfully calved twice and has had no recurrence of the lameness.

Intermittent upward fixation of the patella is prevalent in India where it was first described in 1925 (8). It is uncommon in other countries, but the actual incidence is felt to be higher than reported (9, 13). The clinical signs and treatment of over 1500 cases have been reported in India (3, 4, 12). The rare occurrence of this condition in cattle elsewhere may be due to the fact that cattle are rarely used for work outside of India and southeast Asia. Bulls and bullocks under three years of age are most commonly affected with IUFP. Draft work or an unusual strain on the stifle predispose cattle to IUFP (9). She-buffaloes and, less commonly, cows are also affected with IUFP (4). She-buffaloes are put to draft work in India when they become dry and unproductive whereas cows are not (3). A combi-

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nation of genetic predisposition, pregnancy, and a history of travelling in deep mud in the pasture are felt to have contributed to the IUFP in our case.

Biomechanical action, nutrition, heritability, and neurological lesions have also been incriminated in this syndrome. The bovine patella does not normally ride as high on the femoral trochlea and the medial patellar ligament does not become hooked over the medial trochlear ridge when the stifle is in full extension as occurs in the horse (8). However, with certain breeds and unfavorable environmental conditions, the medial patellar ligament does become lodged over the medial trochlear ridge, since desmotomy of the ligament corrects the lameness. Debility and poor conditioning leading to the absorption of fat between the patellar ligaments has been reported to predispose to IUFP (3). Clinical signs abated when the general nutritional condition of the patient improved in these cases; however, in the West the lameness is usually seen in cattle that are currently in good condition (8). No case of IUFP was found in crossbred animals. In India these crossbred animals are stall confined and fattened for slaughter rather than used as draft animals (3). Heritability has been suggested as a cause of chronic luxation of the patella in a cow and her offspring (12). A neuropathy of the sciatic and femoral nerves has been described in a horse that was destroyed because of recurrent patellar fixations (8).

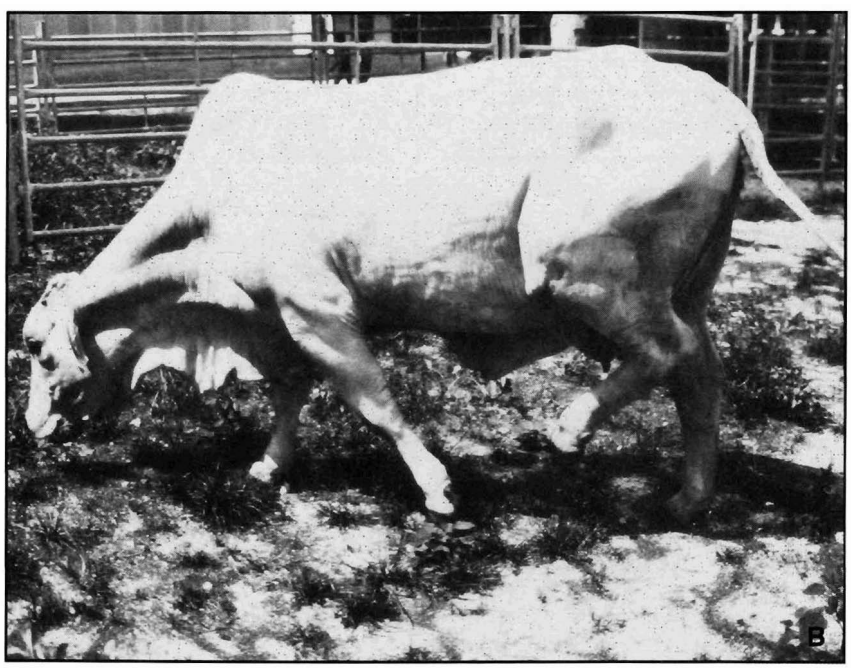

Figure 1. Prior to surgery. A. Caudal view demonstrating dragging of the dorsal aspect of the left rear foot. B. Lateral photograph demonstrating a high arc of the anterior phase of the stride of the left rear limb.

Signs of patellar fixation in nonworking cows occurred in late gestation. Rapid growth, increased weight, and metabolic demands of the fetus in late gestation may predispose these patients to IUFP (8). The nutritional status in the reported cases and in the one examined in this report were good (6, 8). Femoral bone composition was normal in cases of IUFP in which the bone was examined (11). Poor muscle tone around the stifle may allow an increased range of motion of the patella and cause IUFP in the horse (1). This disease may occur sporadically outside of working cattle, because of the requirement for unusual conditions, pregnancy plus excessive extension of the stifle following a slip, or dragging of the limbs through deep mud (9).

Exercise, injection of a weak iodine solution into the femoropatellar joint, and medial patellar desmotomy have been described for treatment of IUFP (1, 4, 10, 12). Calves with IUFP may recover spontaneously. In cases of poor muscle tone in horses return to exercise can decrease the incidences of IUFP (2). If the animal has a predilection for upward fixation, it should be allowed open pasture to help strengthen the supporting structures of the stifle. Chondromalacia of the patella, gonitis, or degenerative joint disease are complications

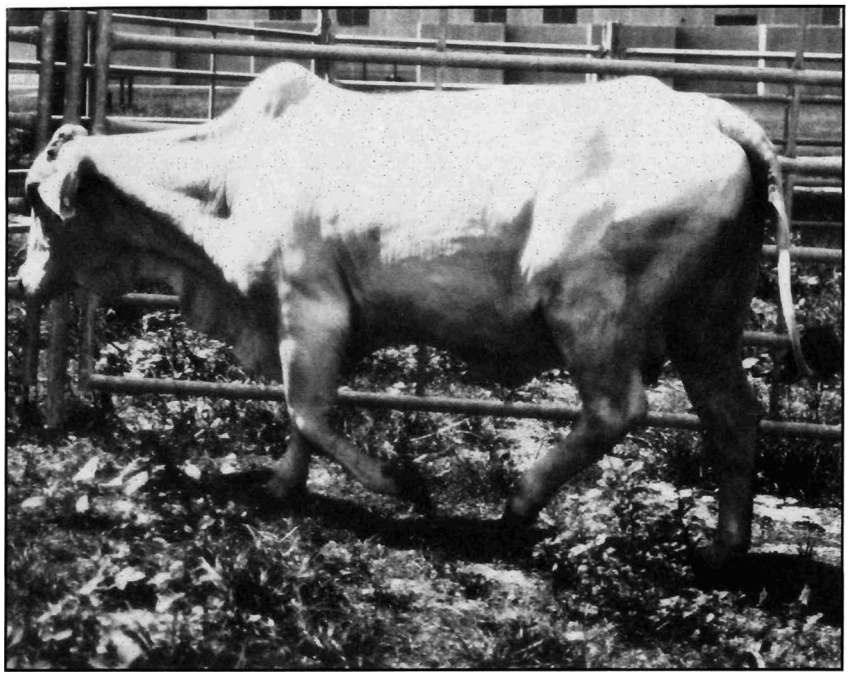

Figure 2. Postsurgery. Lateral photograph demonstrating normal stride immediately after medial patellar desmotomy.

that may arise if the condition is allowed to continue (1, 9).

Medial patellar desmotomy is currently used for the treatment of IUFP in cattle and horses (1, 2, 6, 8, 9). The technique can be performed rapidly and conveniently in the standing animal; the success of the operation is apparent immediately. Contraindications to standing medial patellar desmotomy in a cow include an intractable patient or a developed udder that would prevent proper access to the medial patellar ligament. Sedation and a lateral recumbent position allow access to the medial patellar ligament in these situations (8). Recurrence of IUFP after desmotomy has not been reported in cattle.

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