Diagnosis of navicular syndrome is based on history, clinical signs, response to perineural anesthesia of the palmar digital nerves or DIP intra-articular anesthesia, and detection of radiographic abnormalities. Interpretations of the effects of perineural anesthesia versus DIP anesthesia have become controversial, especially with the recent evidence for lack of analgesic specificity in the DIP joint.\textsuperscript{1,2} In addition, horses in which lameness improves with DIP joint analgesia may not respond to intra-articular medication of the joint. Besides using therapeutic shoeing and systemic antiinflammatory agents, the clinician may decide to treat navicular syndrome with either DIP joint or navicular bursa antiinflammatory medications. DIP joint therapy is often chosen simply because of lack of experience in navicular bursa injection. This column describes a simple technique for navicular bursa injection and suggests indications for its use in treating horses with navicular pain.

Navicular Bursa Injection Technique

Optimally, perineural anesthesia of the palmar digital nerves at the level of the abaxial sesamoid bones is performed. Hair from the palmar aspect of the pastern from the coronary band to the abaxial sesamoid area is clipped using a #40 blade, and the area is prepared for aseptic injection using standard techniques. The horse is usually sedated with 3 mg of detomidine if necessary. The horse is allowed to stand on a clean, dust-free, level surface. Placing the horse’s foot on a 2 × 6–inch board before injection positions the foot for radiographs and facilitates cleaning the injection area. Stocks are useful but not necessary for the procedure. The hoof is cleaned and wrapped with elastic tape to minimize contamination of the injection site. An 18-gauge, 3-inch spinal needle with a stylet is used for the injection. The landmark for needle insertion is on the midline at the distal extent of the depression created by the junction of the collateral cartilages and the deep digital flexor tendon, which is at the proximal extent of the digital cushion (Figure 1). The 3-inch needle is inserted while the limb is weight-bearing.

**KEY POINTS**

- Navicular bursa injections can be easily performed using the measured length of needle insertion and/or radiographic guidance.
- Horses with lameness referable to the navicular area may respond to medication of the navicular bursa when other modalities have failed.
bearing, at a 10° downward angle proximal to the ground surface (Figure 2). At a depth of 1.5 to 2.0 inches, there is resistance from the hard, flexor surface of the navicular bone. Bursal fluid is usually not spontaneously obtained. If hard resistance is felt at a needle depth of less than 1.5 inches, the needle is located either in the palmar aspect of the DIP joint (spontaneous joint fluid is usually obtained) or at the palmar aspect of the second phalangeal bone. In either case, the angle of insertion is not proper and is too parallel to the ground surface. The needle should be withdrawn 1 inch and redirected downward with a more vertical angle (raising the hub of the needle proximal 10°) until the navicular bursa is reached.

If the needle can be inserted to a depth greater than 2 inches, its angle of insertion is too great and the needle is traveling along the flexor surface of the navicular bone (distal to the navicular bursa) and is located within the digital cushion. The needle must be withdrawn and redirected in a direction more parallel to the ground surface. Radiographic assessment using a lateromedial projection with the needle in place is beneficial for determining accurate positioning of the needle within the navicular bursa.

The normal navicular bursa contains approximately 3 ml of fluid. When pathology exists along the flexor surface of the navicular bone or there are flexor tendon adhesions, the bursa contains less fluid (1 to 2 ml). Injection of medication into the bursa can be met with resistance, especially when deep digital flexor adhesions are present. retracting the needle 1 to 2 mm assists injection by reducing the resistance; it also helps to flex the limb at the carpus so that the horse is bearing weight only at the toe of the hoof. I have an assistant stand in front of the horse’s limb and gently pull on the forelimb while bracing the front of the horse’s hoof to the ground with his or her foot. This flexes the horse’s carpus slightly, lifting the heel of the hoof off the ground but keeping the weight on the toe. I believe this provides laxity between the deep flexor tendon and the navicular bursa, thereby facilitating injection.

Confirmation that the navicular bursa is being injected is made by observing back pressure within the 3-ml syringe after deposition of 1 to 2 ml of medication. Alternately, radiopaque dye can be added as described by Turner for taking a postinjection radiograph.

Postinjection Care
Sterile gauze sponges are applied to the injection site and taped in place over the hoof. The horse is given 2.2 mg/kg of phenylbutazone once daily for 5 days and confined to a stall or small run for 1 week. The horse should then have a week of light riding before returning to normal activity. Therapeutic shoeing is performed as dictated by such factors as the horse’s conformation, hoof shape, and activity if they have not already been addressed. Any hoof imbalances are corrected, and we recommend application of a 2° wedge to the shoeing regimen (depending on hoof conformation) to decrease pressure between the deep digital flexor tendon and the flexor surface of the navicular bone. I believe that adding the 2° heel wedge is extremely important before injecting the navicular bursa. It has been shown that raising the heels of the hoof 2° causes a 24% decrease in the tension between the navicular bursa and deep flexor tendon. If deep digital flexor (DDF) adhesions are present on the flexor aspect of the navicular bone, raising the heels may decrease DDF tension and reduce the risk of tendon injury at this site.

Indications for Navicular Bursa Injection
As with most intra-articular modalities, there are no clear-cut
indications for injection that benefit all horses. Response to therapy depends on many variables, including severity of disease, horse use, conformation, and owner compliance. I feel that horses with pain localized to the navicular area by perineural anesthesia of the palmar digital nerves and with one of the following criteria are more likely to respond to treatment of the navicular bursa with 10 mg of hyaluronic acid plus 40 mg of methylprednisolone or 6 mg of triamcinolone and 25 mg of amikacin:

- Radiographic evidence of exostosis or spurring on the flexor surface of the navicular bone at the attachment of the collateral sesamoidean ligament near the proximal recess of the navicular bursa; these lesions are most commonly seen on the lateromedial radiographic view
- Mild radiographic erosions along the flexor surface of the navicular bone suggestive of deep digital flexor tendon pathology at this location
- Navicular pain (with or without radiographic abnormalities) that does not respond to DIP joint treatment
- Advanced radiographic abnormalities of the navicular bone that are not responsive to DIP joint therapy but improve after perineural anesthesia of the palmar digital nerves

I have treated numerous horses that satisfy the above criteria with navicular bursa therapy. The majority of these horses have moderate to severe degenerative navicular syndrome that is not responsive to DIP joint therapy, therapeutic shoeing, and systemic antiinflammatory medications. The navicular bursa injection usually results in improved lameness or relative soundness for 3 to 6 months, depending on the severity of the disease and level of the horse’s activity.

Complications

I have observed four horses with prolonged duration of lameness (grades 2 to 3 of 5) that returned to soundness after bursa injection but became severely lame (grade 4 or 5) 6 to 8 weeks after the injection. All four horses had moderate to severe deep digital flexor tendonitis at the level of the pastern that required euthanasia in two of the horses. All four of these horses had navicular bursa injections at least three times, usually at 3-month intervals. The two that were euthanized did not have a 2° wedge added to the shoeing regimen. I suspect that deep flexor tendon adhesions and/or pathology existed; and as the horses’ level of pain decreased following injection, excessive activity may have led to adhesion tearing and deep flexor tendonitis. Currently, I try not to repeat the navicular bursa injection more than once every 6 months and insist on elevating the horse’s heels.

Chronic navicular pain (navicular syndrome) that fails to respond to therapeutic shoeing, rest, systemic antiinflammatory medications, and DIP joint therapy can be frustrating for both the owner and veterinarian. Many owners are reluctant to have a palmar digital necrectomy performed because they fear complications from the procedure (e.g., painful neuroma formation, nerve regrowth, DDF rupture) or have financial reasons.

Medicating the navicular bursa is easy to perform in the field and provides temporary relief of clinical lameness in some horses that have become nonresponsive to other therapeutic modalities. A few horses have developed DDF tendonitis weeks after the injection. I attribute this to improvement of the lameness after injection and an increase in the horses’ activity. The horses may feel “too good” and overexert themselves, thereby tearing adhesions between the navicular bone and DDF or causing increased damage to the DDF from erosions on the flexor surface of the navicular bone. Therefore, I use navicular bursa injections judiciously because repeatedly injecting the navicular bursa increases the likelihood of complications. Using a wedge pad or shoe to decrease the pressure between the flexor surface of the navicular bone and DDF tendon is highly recommended. Needle penetration through the DDF could contribute to tendon damage that is exacerbated with exercise.

Conclusion

Lameness in horses with lesions involving only navicular bone fibrocartilage (confirmed by navicular bursography) has been improved by treating the navicular bursa. Although this usually does not result in permanent improvement, it allows a horse to continue working when other treatment modalities have failed.

Navicular bursa injections can be easily performed using a measured length of needle insertion and/or radiographic guidance. Horses with lameness referable to the navicular area (navicular syndrome) and specific radiographic abnormalities respond to treatment of the navicular bursa.

References