How to Perform Navicular Bursa Injection and Indications for its Use

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Navicular bursa injection can be easily performed using measured length of needle insertion and/or radiographic guidance. Horses with lameness referable to the navicular area and specific radiographic abnormalities respond to treatment of the navicular bursa. Authors' address: College of Veterinary Medicine, Texas A&M University, College Station, TX 77843. © 2001 AAEP.

1. Introduction
It is estimated that 30–50% of forelimb lamenesses in the horse involve pain arising from the caudal aspect of the foot. Navicular syndrome is a degenerative disease process involving at least one of many structures in the caudal aspect of the foot such as the distal sesamoid (navicular) bone, palmar aspect of distal interphalangeal joint (DIP), the navicular bursa, distal aspect of deep digital flexor tendon, and the collateral and impar sesamoidean ligaments. Diagnosis of navicular area pain is usually 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 or navicular bursa anesthesia have become controversial, especially with the recent evidence of lack of specificity of analgesia of the DIP joint. In addition, horses in which lameness improves with DIP joint analgesia may or may not respond to intra-articular medication of the joint. Besides therapeutic shoeing and systemic anti-inflammatory agents, the clinician may decide to treat either the DIP joint or navicular bursa with anti-inflammatory medications. Often DIP joint therapy is chosen simply because of lack of experience in navicular bursa injection. The purpose of this article is to describe a simple technique for navicular bursa injection and indications for its use in the treatment of horses with navicular area pain.

2. Methods
Navicular Bursa Injection Technique
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 coronary band to 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 detomidine depending on the horse's attitude. The horse is allowed to stand on a clean, dust-free level surface. Placing the horse's foot on a 2” × 6” board prior to 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 stylet is utilized for the injection. Landmarks for needle insertion is on midline at the distal extent of the depression created by the junction of the collateral cartilages and deep digital flexor tendon which is at the proximal extent of the digital cushion (Fig. 1). The 3-inch needle is inserted at a 10° downward angle proximal to the ground surface (Fig. 2). At a depth of 1.5 to 2.0 inches a hard resistance is felt, which is the flexor surface of the navicular bone. Bursal fluid is usually not spontaneously obtained. If a hard resistance is felt at a needle depth of < 1.5 inches then the needle is located in the palmar aspect of the DIP joint and spontaneous joint fluid is usually obtained or the needle is located at the palmar aspect of the second phalangeal bone. In this case, the angle of insertion is not angled properly and is too parallel to the ground surface. The needle is withdrawn 1 inch and redirected downward with more vertical angle until the navicular bursa is reached. If the needle can be inserted to a depth >2 inches, the needle has too much angle and is traveling 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 to determine accurate positioning of the needle within the navicular bursa (Fig. 3). The normal navicular bursa contains approximately 3 ml of fluid but we have found that when pathology exists along the flexor surface of the navicular bone or when flexor tendon adhesions are suspected, that the bursa contains less fluid (1–2 ml). Injection of medication into the bursa can be met with resistance especially when deep digital flexor adhesions are present. Retraction on the needle 1–2 mm assists injection by reducing the resistance as does flexion of the limb at the carpus so that the horse is bearing weight only at the toe of the hoof. Confirmation that the navicular bursa is being injected is made by observing back pressure within the 3-ml syringe after deposition of 1–2 ml of medication. Alternately, one can add radiopaque dye as described by Turner and take a post injection radiograph.

Post-Injection Care
Sterile gauze sponges are applied to the injection site and taped in place over the hoof. The horse is administered 2.2 mg/kg phenylbutazone q 24 h for 5 days. The horse is confined to a stall or small run for 1 week followed by 1 week of light riding before returning to normal activity. Therapeutic shoeing is performed as dictated by the horse’s conformation, hoof shape, activity, and so on, if it has not already been addressed. Any hoof imbalances are corrected and we recommend application of a 2° wedge to the shoeing regime depending on hoof conformation to decrease pressure between the deep digital flexor tendon and the flexor surface of the navicular bone.

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 is dependent on many variables including the severity of disease, horse
use, conformation, owner compliance, and so on. We 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 hyaluronic acid plus 40 mg of Depo Medrol or 6 mg of triamcinolone.

1. Horses with 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. (Fig. 4).
2. Horses with radiographic erosions along the flexor surface of the navicular bone, which is suggestive of deep digital flexor tendon pathology at this location.
3. Horses with navicular pain with or without radiographic abnormalities that do not respond to DIP joint treatment.
4. Horses with 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. (Fig. 5)

3. Results
We have treated numerous horses with the above described criteria with navicular bursa therapy. The majority of these horses have moderate to severe degenerative navicular disease that are not responsive to DIP joint therapy, therapeutic shoeing, and systemic anti-inflammatory medications. The navicular bursa injection usually results in improvement in lameness or relative soundness for 3 to 6 months depending on severity of disease and level of the horse’s activity. We have observed 3 horses that had prolonged duration of lameness return to soundness after the bursa injection but became severely lame 6 to 8 weeks after the injection. All 3 horses had a moderate to severe deep digital flexor tendonitis at the level of the pastern.

4. Discussion
Horses with chronic navicular area pain that fail to respond to therapeutic shoeing, rest, systemic anti-inflammatory medications and DIP joint therapy can be frustrating for both owner and clinician. Many owners are reluctant to have a palmar digital neurectomy performed due to fear of complications of the procedure (painful neuroma formation, nerve regrowth, DDF rupture, etc.) or for financial reasons. Medication of the navicular bursa is an easy procedure 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 cases have developed DDF tendonitis weeks after the injection. We attribute this to the improvement of the lameness after injection and an increase in the horse’s activity. The horses may feel “too good” and overexert themselves; thereby tearing adhesions between the navicular bone and DDF or increasing damage to the DDF from erosions on the flexor surface of the navicular bone. For this reason, we feel that repeatedly injecting the navicular bursa increases the likelihood of complications and we use this injection judiciously. It is also for this reason that we recommend a wedge pad or shoe to decrease the pressure between the flexor surface of the navicular bone and DDF tendon. Alternately, the needle penetration through the DDF could contribute to the tendon damage that is exacerbated with exercise.
The use of navicular bursography has been described as a diagnostic regime for evaluation of navicular bone flexor fibrocartilage and is a useful procedure for those purposes, but requires a second injection into the navicular bursa to treat the problem once diagnosed, which could cause further DDF tendon damage. We have seen improvement in lameness in horses that have chronic navicular pain with the described radiographic lesions by treating the navicular bursa. Although this usually does not result in permanent improvement, it allows the horse to continue in work when other treatment modalities have failed.

References