HEALTH ZONE *Joint Health*

Updates from the AAEP Convention

Preparing Joint Injection Sites

BY DR. NANCY S. LOVING

CHRISTY WEST

Care should be taken when preparing a site for a joint injection

When administering equine joint injections, veterinarians must take steps to minimize the risk of septic arthritis developing in the treated joint. Particularly in equine athletes, septic arthritis can be a devastating and debilitating complication, though aggressive treatment returns a large range (27-92%) of affected horses back to work.

At the 2012 American Association of Equine Practitioners' (AAEP) convention, held Dec. 1-5 in Anaheim, Calif., Dr. Stephen Adams, of Purdue University's School of Veterinary Medicine, described appropriate site preparation and needle selection for septic arthritis prevention.

"Up to 80% of septic arthritis cases subsequent to joint injections are due to Staph species that, in fact, live on the horse's skin, as well as the veterinarian's skin," Adams said. "One can never completely disinfect all layers of all portions of the skin."

Still, preparing the injection site helps minimize the risk of joint contamination. In previous studies veterinarians have demonstrated that the presence of hair at the injection site does not inhibit antiseptics' ability to effectively reduce the skin surface bacterial flora to an acceptable level. In other recent studies, investigators proved that scrubbing with chlorhexidine was superior to using tamed iodine (Betadine solution).

Adams recommended veterinarians perform a two-stage prep using sterile gauze sponges, chlorhexidine/saline, and isopropyl alcohol applied with gloves. He discouraged using prefabricated solutions, such as jars of gauze presoaked in Betadine or chlorhexidine solution, as they are susceptible to airborne contamination.

Needle size and direction of insertion can also impact the veterinarian's chances of introducing tissue fragments and hair into a joint. Adams reported that using 18-gauge spinal needles in humans during arthroscopy produced identifiable tissue fragments in the joint 100% of the time. In two studies in which he sought to find methods to minimize the joint contamination risk, Adams came to the following conclusions:

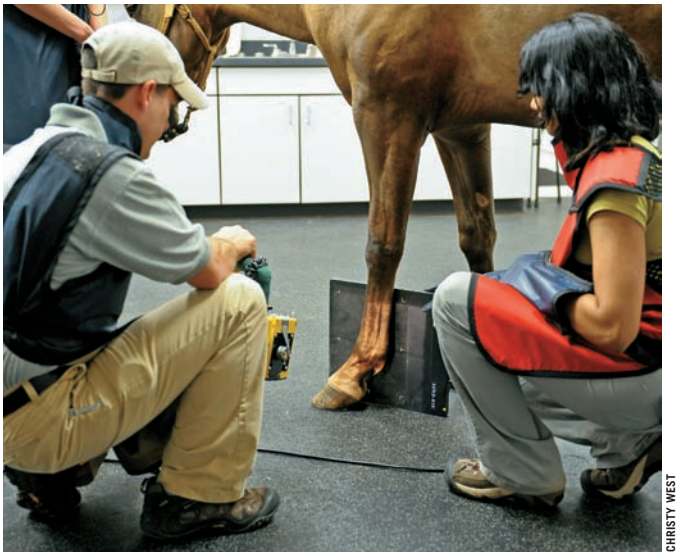
- Clipped or razored hair increases the risk of hair contamination into the joint by 2.4 times and 1.69 times, respectively;
- Reusing a needle increases contamination risk by 1.7 times;
- It is best to use the smallest needle possible; 22 gauge is better than 20- or 18-gauge;
- After placing a needle in the joint, allow the needle to clear with dripping joint fluid when possible;
- It is preferable to insert a needle at an angle to the joint surface rather than straight in;
- It is preferable to use 22-gauge spinal needles (rather than larger needles) to decrease the risk of introducing hair fragments;
- Removing the stylet (the fine wire that runs through the needle) from a spinal needle increases contamination risk fivefold;
- Deep layers of the skin cannot be disinfected; and
- There is no need to remove hair prior to joint injection unless using 20-gauge or larger spinal needles.

In conclusion, Adams stressed that veterinarians should take considerable care when preparing a site for joint injection, along with selecting optimal needle size and placement to minimize joint contamination and risk of developing infection.

Limb Positioning for Assessing Joints Via X-Ray

BY DR. STACEY OKE

Lower limb radiographs can help practitioners uncover valuable information about bones, joints, and joint balance in equine athletes, but Colorado State University researchers have determined the usefulness and accuracy of this information depends largely on how the horse stands during X-ray capture.



CHRISTY WEST

How a horse stands is vital to getting reliable radiographs

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"Imbalances in certain joints such as the interphalangeal joints, also called the pastern and coffin joints, can influence gait, biomechanics, and soundness in horses," said Dr. Erin Contino of CSU's College of Veterinary Medicine, in her presentation at the AAEP convention.

Imbalances can occur for several reasons, such as the horse's natural conformation, the type of shoe it is wearing, or the way it is shod. Imbalances in the foot where one heel bulb is "higher" than the other, for example, can impact the balance of the joints higher up in the limb, change how the horse bears weight, and even affect how he moves. In fact, notes Contino, foot imbalances can influence gaits, biomechanics, and soundness.

Further, Contino and colleagues suspected that how the horse's foot is positioned while taking radiographs can influence joint balance, making accurate X-ray interpretation difficult if the foot is not positioned appropriately.

To test this theory, the researchers took radiographs (dorsopalmar, taken directly from the front to back of the limb) of 14 limbs in nine horses. During the study the team placed horses in three different positions: square, and in 5° and 10° abduction (by moving the foot out sideways). They measured two "sides" of the pastern and coffin joints (the later and medial joint spaces) in all three positions. Key findings were:

- Limb abduction resulted in narrowing of the joint space on the medial (inner) aspect of the joint; and
- Joint balance differences between the different limb positions were statistically significant.

"As we hypothesized, how a horse is positioned while taking the X-rays significantly affects joint balance," said Contino. "Practitioners are therefore encouraged to position the horse as squarely as possible as correct positioning is essential for evaluating the pastern and coffin joint spaces."

Supplement to Support Post-Surgical Joint Health

BY ERICA LARSON

A research team from the Nutraceutical Alliance shared some good news for owners of horses with osteoarthritis at the AAEP convention: A nutritional supplement fed immediately after osteochondral fragment removal surgery could help reduce the amount of post-surgical inflammation in the joint.

Dr. Wendy Pearson, president of the Nutraceutical Alliance, presented study results at the convention.

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Joint Health

Pearson explained that researchers had previously shown that a joint supplement—"4CYTE," produced by the Australian company Interpath Pty—that contains a patented plant extract inhibited prostaglandin E2 (PGE2, a chemical produced by the body that is involved in inflammation and in pain perception) production in horses with experimentally

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induced joint inflammation. In the current study researchers evaluated the effect of the supplement in horses with articular inflammation and/or joint damage due to osteoarthritis fragments in the knee or fetlock.

The team hypothesized that including the supplement in affected horses' diets would "reduce synovial fluid PGE2, nitric oxide (both indicators of pain and inflammation), and glycosaminoglycan (an indicator of cartilage breakdown), while improving clinical signs of articular inflammation in these horses," Pearson said.

They studied 15 horses undergoing surgery to remove abnormal pieces of cartilage, called osteochondral fragments, from the surface of either the knee or fetlock joint. Horses received either 21 grams of the supplement per day, starting immediately after surgery, or they acted as controls and received an equal amount of a placebo supplement.

Pearson said the team analyzed horses' synovial fluid before and after supplementation, specifically assessing PGE2, nitric oxide, and glycosaminoglycan levels; they also took radiographs of the affected joints and performed lameness examinations.

The researchers found:

• 45 days after surgery, synovial fluid PGE2 levels were significantly lower in horses consuming the supplement;

• No significant decline in synovial fluid PGE2 in horses treated with surgery alone;

• 60% of control horses had radiographic evidence of periosteal reactions and/or

DEGENERATIVE JOINT DISEASE

What is degenerative joint disease? Also referred to as osteoarthritis (OA) by definition, this process is ongoing and a normal occurrence or an expected change with age. It is characterized by inflammation of the affected joint due to deterioration of the cartilage of the end caps of the bones that are in contact. The amount of destruction of this cartilage determines the degree of arthritis and arthritic changes to the joint in question and has tremendous bearing on the amount of athletic use the equine performer can withstand.

The clinical signs associated with osteoarthritis have a wide range of symptoms, ranging from mild effusion to lameness and extreme swelling, heat, and loss of range of motion of the affected joint, and decreased weight bearing. OA is caused by different things. It can be brought on by trauma to an affected joint as well as by normal "wear and tear" over time; by conformation defects that create uneven wear of joint cartilage; by infections introduced into the joint (via injection of septicemia or "blood infection"); by the immune system whereby the animal's own defenses start destroying the surrounding structures and eventually the cartilage as well; and by injecting cartilage-destroying compounds into joints. A typical rule of thumb for OA is that the symptoms are directly proportional to the amount of cartilage loss or damage. OA has many causes and numerous presentations in the horse. The difficulty is proper diagnosis of the joints being affected.

The best way to make sure that your horse can continue to perform at its discipline without setbacks in training due to the effects of OA are to develop a routine that evaluates your horse regularly. You should have a routine that allows you to palpate all four of your horse's limbs and see if they are symmetrical in size and range of motion upon flexion. In addition you need to evaluate your horse's normal gait at the walk and trot prior to saddling, or tacking your horse up for its regular exercise or work routine. Finally, you should notice your horse's posture in its stall, whether it lies down more than normal or tends to pile bedding under its front feet. Anything that is a break from your horse's regular behavior or routine could be an early sign of change or joint discomfort.

The earlier you recognize these breaks from their normal routine, the faster you can start to make proper steps to fix the problem or at least take measures to aid in the repair process. All of these measures would fall into preventative medicine.

My favorite saying has always been: "Preventative medicine is much better and smarter than restorative medicine."

Dr. Steve Allday specializes in equine sports medicine with a focus on Thoroughbred racehorses. Dr. Allday's veterinary credentials include five Thoroughbred Horses of the Year, 13 Triple Crown race winners, and 29 Breeders' Cup race winners. He is the developer of the LubriSyn family of products—an all natural, oral joint supplement and Re-Borne whole bovine colostrum that is a safe, non-test boost for your horse's performance.

CHRISTY WEST

Nutritional supplements may help reduce the amount of post-surgical inflammation

osteophytes (indicators of arthritic changes), whereas only 35% of horses on the supplement exhibited these changes; and

• No difference between treatment and control groups in synovial fluid nitric oxide or glycosaminoglycan levels, radiographic findings, or lameness grade.

"These data support previously published experimental evidence of an inhibitory effect of 4CYTE on synovial fluid PGE2," she concluded. "4CYTE is an excellent proactive supplement for supporting postoperative joint health in horses. The data from the

current study add to an already impressive portfolio of research demonstrating efficacy and safety of 4CYTE in horses."

Pearson said that 4CYTE is available through veterinarians in the United States and Canada.

Evaluating Joint Infections Using SAA Levels

BY DR. STACEY OKE


RICK SAMUELS

Only 48-66% of horses return to their previous athletic ability after a joint infection

Joint infections are a serious occurrence in horses with the potential to end an athletic career or even a life. Although survival rates are as high as 62% in foals and 85% in adults, only 48-66% of horses return to previous athletic activity after a joint infection.

"A successful outcome requires early and aggressive treatment, including the intra-articular injection of a suitable antibiotic such as amikacin," said Andres Sanchez Teran of the University of Pretoria's Department of Companion Animal Clinical Studies in South Africa (though he's currently at the Western College of Veterinary Medicine, University of Saskatchewan, Canada). Since there's no reliable way to determine whether treatment is working, Sanchez Teran and his colleagues in Pretoria set out to find one, and he presented the results during the AAEP convention.

This inability to monitor joint infections negatively impacts a horse's chance for survival or function. Scientists know that cells lining the inside of the joint produce a protein called serum amyloid A (SAA), and SAA levels increase in cases of infection. More importantly, SAA levels in synovial (joint) fluid do not increase following routine joint injections the way total protein and total nucleated cell counts (NCCs) do.

"This means SAA could be a better marker of joint infection (than total protein and other cell counts that are currently used)," explained Sanchez Teran.

To test this hypothesis, Sanchez Teran and colleagues collected synovial fluid by inserting a needle into the middle knee joints of five horses every two days for a total of five times. In the control group the team simply collected a fluid sample, and in the treatment group they injected the antibiotic amikacin after collecting the fluid. They measured SAA, total protein, and NCC in all samples.

The team's key findings were:

- As expected, total protein and NCC increased significantly after the first joint injection;
- In some cases, the protein and NCC levels were so elevated they reached the point that would be expected in infected joints; and
- Synovial fluid SAA levels did not increase in either group of horses.

"Because SAA levels in synovial fluid are not affected by the process of inserting a needle or administering amikacin into a joint, SAA could potentially be used to monitor response to treatment following administration of amikacin into the joint," concluded Sanchez Teran.

He added, "For example, this means that if SAA levels are elevated in infected joints, the SAA levels would be expected to drop as the infection resolves." BH

Excerpted from The Horse: Your Guide to Equine Health Care. Free weekly newsletters at *www.TheHorse.com*