

The Dilemma of Bucked Shins in the Racehorse

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Introduction

One of the most common problems that young race horses develop is bucked shins. It has been reported that 70% of young Thoroughbred racehorses in training develop the problem. Bucked shins are commonly accepted by veterinarians, trainers and owners as a normal training event in young Thoroughbreds. Bucked shins usually occur in 2 year-old racehorses during the first six months of their training. The estimated losses to the industry as a result of the problem exceed \$10 million/yr. Approximately 12% of horses that develop buck shins go on to have stress or saucer fractures later. Technology has recently allowed a better understanding of the disorder. Training appears to play a major role in its development.

What are Bucked Shins?

Bucked shins is an inflammatory condition of the front (dorsal) cortex of cannon bones. It is part of a complex called dorsal metacarpal disease. Both front legs can be affected. If both legs become involved it is of the left that develops problems first because of the counterclockwise direction of racing in the U.S. and the higher loading of the left in the turns. Bucked shins is a result of high-strain repetitive motion injury within the cannon bone. The repetitive motion injury comes from the rigorous training regimen that 2 year-olds often face and inability of the bone to adapt fast enough. As the horse becomes older the cannon bone becomes stiffer and thus rarely will bucked shins occur again.

Clinically, the condition is diagnosed by physical examination using palpation of the cannon region in which heat, pain upon pressure over the area, and swelling is detected over the dorsal or dorsomedial surface. The horse may be short-strided or lame. Radiographs may also show changes but may lag the clinical signs. Radiographic changes include new bone formation on the [periosteal] surface and thickening of the front of the cannon bone (Figure 1).



Figure 1. Radiographic appearance of bucked shins. Notice the thickening of the front of the bone.

Treatment of Bucked Shins

There are many different treatments for bucked shins. Pin firing and blistering are the most commonly used forms of treatment. These forms of treatment cause heating of the tissue, and the theory is that heat helps damaged tissue to heal by increasing the circulation to the area. The secret to the use of these irritants, however, is the rest that goes along with the paint. Also too much irritation causes tissue damage and is counterproductive especially if applied over the fetlock joint as well. Other treatments that are used include periosteal scraping to encourage more micro circulation to improve healing. Cold water hosing, icing, along with phenylbutazone (an anti-inflammatory) administration and stall rest is most often recommended until the pain and swelling has gone. If this course of action is not taken immediately and the horse continues to train, it may take be four to six weeks before the pain and swelling subsides. Unfortunately some horses go on to develop stress or saucer fractures in the cannon bone even up to a year after bucking their shins (Figure 2).



Figure 2. Radiographic appearance of a stress fracture of the cannon bone.

This is another part of the complex of dorsal metacarpal disease. Dorsal cortical stress fractures in young horses may resolve with conservative treatment as discussed above. Convalescent period may be 4 to 6 months, because fracture healing is slow in the cannon bone. Older horses that get these, which is the case most of the time, surgery is recommended. Two surgical treatments are used. Either or both may be used in a case. One technique is to place a screw across the stress fracture line to try to stabilize the fracture (Figure 3).



Figure 3. Insertion of a lag screw in a stress fracture of the cannon bone.

The other technique called osteostixis is to drill several small holes across the fracture line into the marrow cavity (Figure 4). This allows bone marrow cells to flow into the fracture line to enhance healing.



Figure 4. Drill holes placed across a stress fracture in the cannon bones.

Recently extracorporeal shockwave therapy has been used with success. The goal of these treatments is to achieve complete healing in a shorter period of time. However, convalescent time is still 6 to 8 months in most cases. It is also important that serial follow-up radiographs be taken every 30 to 45 days to assess healing.

Prevention of Bucked Shins

The type and intensity (speed) of training and racing determines what type of stresses will be placed on the cannon bone. For instance, a Thoroughbred's cannon bones remodel their structure into a different shape than a Standardbred racehorse. Over time, increased bone thickness and strength develop in the areas of most stress to the bone. This means the type of training is very important to development of strength in the cannon bones in the appropriate areas. So, can altering conventional training methods of racing Thoroughbreds reduce or eliminate the incidence of bucked shins? It can according to research conducted by Dr. David Nunamaker and associates from New Bolton Center in Pennsylvania. He has found that young horses have higher strains on their cannon bones when running fast than do older horses. He reports that the direction of the principal strains, in Thoroughbreds, seems to change significantly with increasing speed. Training young race horses without developing bucked shins is the art of regulating the frequency and intensity of the workouts so that enough strength is built into the bones while avoiding the weakening that occurs during bone remodeling. Conventional training programs will gradually increase the exercise distance and intensity of a horse to gallops of two miles per day, with breezes at 7, 10, or 14 days, with these high speed workouts gradually increased so that the animals are breezing the distance of their race, with workouts of a half mile or more being common. Nunamaker's revised training program is aimed at decreasing the distance galloped, usually to one mile. Slow-speed jogging for conditioning is detrimental to the bone because the principal strain directions in the bone are quite different from those in the fast-working gait. Short, higher-speed workouts (breezes) are included two times a week at the end of the gallops, with the distances slowly increasing from a furlong to a half mile. A modified training program recommended by Dr. Nunamaker is provided below.

	Protocol	Intensity	Duration of STAGE:
Horse worked 6 days/week	Walked to track Walked ½ mile on track Jogged ½ mile on track Galloped 1 mile	Daily	
STAGE 1	Last 1/8 mile of gallop completed in 15 seconds	Performed 2 days a week	5 weeks
STAGE 2	Last ¼ mile of gallop completed in 30 seconds	Performed 2 days a week	5 weeks
STAGE 3	Gallop lengthened to 1 ¼ mile.	Daily	
	Breezed ¼ mile in ̑26 seconds.	Once a week	4 weeks
	Strong gallop added to the ¼ mile breeze for a total time of ̑40 seconds.	Once a week	3 weeks

In the event that a horse has to take time off because of illness, at 10 -14 days off, a one-month backup in the training schedule is suggested, as this time off might be enough to activate bone remodeling.

The Bottom Line

High-speed exercise in small doses seems highly protective against bucked shins whereas long galloping exercise increases the risk for buck shins. So, as the old adage goes: “An ounce of prevention is worth a pound of cure.”