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9. ABSTRACT

A brief paper which discusses the slides illustrating symptoms and methods of treatment for each problem. The common forelimb lamenesses in equines covered are: puncture wounds of the sole and subsolar abscess, laminitis, navicular disease, fracture of the third phalanx, fracture of the first and second phalnges, ringbone, traumatic arthritis of the fetlock joint, fractures of the fetlock joint, fractures of the margin of the first phalanx, sesamoid fractures, tendosynovitis, periostitis of the third metacarpal, splints, fracture of the splint bone, carpitis, and fractures of the carpal bones.

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APPENDIX VI

SOME COMMON FORELIMB DISEASES IN THE EQUINE

Paper Presented by

Dr. C. L. Padmore

August 11-17, 1975

at the

Carribean Veterinary Conference

Port of Spain, Trinidad

APPENDIX VI

Some Common Forelimb Lamenesses in the Equine

For the full time equine practitioner, as well as for the veterinarian who sees only an occasional pleasure horse, lameness presents one of the most frequent problem condition.

Forelimb lameness are much more common than hindlimb lameness. This is due to the fact that the forelimbs of the horse bears 60-65% of the body weight. Some work on telemetry on the equine foot disclosed that a 1000 lbs. horse running 3/8 of a mile in 34 secs., with a 110 lbs. jockey on his back expends about 1,850,000 foot pounds of energy most of which is transmitted to the forelimbs. Because of their weight bearing factor the forelimb of the equine is subjected to more injuries from trauma and concussion. Another important factor regarding forelimb lameness which is often overlooked is that the forelimb also aid in the propulsion of the animal's body and many injuries are known to occur at that particular phase of the stride.

What I propose to do this afternoon is to discuss with you some of the more common forelimb lameness that we see in the equine. I will not spend too much time on the symptoms, but will discuss them very briefly, as we go along I will try to point out some of the more salient features.

In our clinic we try to impress on our students the development of a sequence in the examination and diagnosing of lameness. First we try to determine which leg is affected; second we try to locate the area involved; third we always try to determine what the lesion is. Because 80% of all equine lamenesses can be traced directly or indirectly to the feet this area is often times the first area examined and as such this is an excellent area to begin.

Slide 1 - Puncture Wounds of the Sole and Subsolar Abscess is the result of the horse stepping on a sharp object, such as this nail, or on a three cornered rock which could break a dry sole.

Lameness is the most consistent finding with a puncture wound of the sole. The lameness may not develop immediately after the puncture has occurred, but when the accumulation of exudate is sufficient to cause pressure the horse will exhibit an obvious lameness. As the exudate accumulates the horny sole is undermined from the corium and the exudate will drain at the heel.

Treatment - The original puncture site in the sole should be pared out in a conical fashion at least 2 cm in diameter. The entire undermined area should be removed. If

the subsolar abscess is small or the related structures of the foot are not involved the horse will go sound as soon as the abscess is opened.

Medical treatment of puncture wounds and subsolar abscess varies widely. Soaking the foot in a super-saturated solution of magnesium sulfate, or applying a poultice are beneficial procedures until the acute inflammation has subsided. In our clinic simple puncture wounds have been successfully treated by packing the pared out area of the sole with iodine crystals and placing a few drops of turpentine on the crystals - this produces a cauterizing effect. As soon as the wound is dry and there is no evidence of exudation around the edges of the pared sole, a shoe with a full leather pad (Slide 2) may be applied. Before the pad and shoe are applied, the sole should be packed with pine tar and oakum. Warm pine tar should be poured under the pad twice weekly until the shoe is reset in 4 to 6 weeks. In all cases of puncture wound or subsolar abscess the administration of tetanus antitoxin or a tetanus toxoid booster (if the horse is permanently immunized) and antibiotics are indicated. In cases where the leg is swollen a support bandage and phenylbutazone are beneficial.

Laminitis

Laminitis is a very common cause of lameness in our area. All four feet may be affected but the front feet are primarily involved.

Laminitis is thought to be caused by multiple conditions, but the most common form encountered is due to an enterotoxemia. This can be due to overeating of grain or a post-parturient infection. Two forms of laminitis are observed. These are the acute and chronic forms. Acute laminitis is characterized by rapid development. If all four feet are involved the horse will refuse to stand, and if forced to walk the gait will be a shuffle with an occasional stumble. There is increased heat in the feet and a bounding digital pulse. Other signs of toxemia such as an elevated temperature, infected mucous membranes, diarrhea or constipation, and muscular tremors may be evident. In chronic laminitis, the acute phase has passed and the horse has recovered from the initial laminitis. This form is manifested by:

1. Increased hoof production (Slide)
2. Rotation of the third phalanx (Slide)
3. Convexity of the sole (Slide)
4. Disruption of the white line (Slide)

Treatment - Laminitis, no doubt, has been treated with as many different preparations as any condition and the results have been quite variable.

In view of recent findings, however, the method of treatment now being used by practitioners is that proposed by Dr. James Coffman at the University of Missouri who has done extensive work in this area.

Cases of acute laminitis should be treated as emergencies to prevent severe damage to the laminae of the feet. Therapy is centered around:

1. Evacuation of the gastrointestinal tract - Mineral oil
2. Anesthesia of the palmar nerves - this decreases peripheral resistance and allows exercise on a soft surface. This in turn provides compression of the digital cushion, which enhances venous return. Anesthesia of the digit is best accomplished by depositing 3 to 5 ml.of 2% xylocaine over the palmar nerves as they cross the abaxial surface of the proximal sesamoid bones.
3. Administration of glucocorticoid steroid - (Dexamethasone 200mg/100 lbs B.W. I.V and 200 mg/200 lbs B.W. I.M.) this decreases platelet aggregation, maintain RBC elasticity, enhances capillary perfusion, and protect capillary integrity. However, glucocorticoid steroids predispose to secondary infection and inhibit protein synthesis. Therefore the use of steroids beyond the second day is contraindicated.
4. Administration of Phenylbutazone - this drug has properties similar to the glucocorticoid steroids but have the added advantage of producing analgesia and even more important is the fact that it does not predispose to secondary infection and does not seriously inhibit protein synthesis (dosage 200 mg/100 lbs I.V., or 1 gm/ 250 lbs orally up to 5 days)
5. Provision of a methionine substrate - this is an important part of the therapy since cell maturation in keratin synthesis has been described as a methionine-dependent system. (Dose 10 gm daily for 4 days followed by 5 gm daily for 10 days is satisfactory for a 1000 lb horse).
6. Administration of parental antibiotic - to prevent secondary infection.

In chronic laminitis therapeutic shoeing is very helpful in prolonging the usefulness of these animals.

The basic concepts for therapeutic laminitis shoeing:

1. Remove the excess hoof
2. Relieve the wall to ground pressure in the toe region
3. Lower the heel
4. Provide constant and diffuse sole pressure

Slide - this shows the excess hoof to be removed

Slide - this compares trimmed and untrimmed hoofs

Slide - relief of wall to ground pressure in the toe region by removing a section of toe. Another method of doing this is to remove the section from the toe of the shoe - so-called "floating toe shoe".

Slide - the heel should also be lowered in an effort to correct the rotation of the third phalanx.

Slide - Acrylic powder and fluid (distbd. by H.D. Justi and Sons, 32 and Spring Garden Streets, Phila. Penn.), mixing cups and wooden stirrers, along with aluminum foil which is used to keep the acrylic on the foot until it hardens.

The acrylic powder which is supplied as a polymer, is mixed with the fluid which is a monomer in a 2:1, or 3:1 mixture which hardens in 6 to 10 minutes.

Slide - the foot is prepared for shoeing and the shoe is nailed in place. Although regular shoes can be used satisfactorily, I find that a shoe with a two inch bar will hold the acrylic in place better. A piece of adhesive tape around the wall and onto the shoe will prohibit escape of liquid acrylic out the toe space and will facilitate its filling with acrylic.

Slide - the sole is being moistened with the fluid, this increases the adhesion of the acrylic to the sole.

Slide - the acrylic mixture is prepared before the sole is moistened and is poured onto the sole immediately after it is moistened.

Slide - the sole is filled to overflowing so that an excess of acrylic will be present to be forced under the shoe.

Slide - Aluminum foil is placed over the acrylic filled sole and around the hoof to confine the semifluid.

Slide - This is the finished product

Navicular Disease

This condition may be related to heredity, concussion, conformation or trauma.

Navicular disease invariably involves only the forefeet - this is probably due to the fact that the forefeet is subjected to more weight and receive more concussion during work

The animal often has a history of intermittent lameness that improves upon rest and warms out. Unilateral involvement results in pointing of the affected foot while bilateral involvement may produce alternate pointing or an extended stance of the forelegs. If the animal is observed in motion it will be noted that there is a tendency to land on the toe of the foot to avoid concussion. Because of this the anterior phase of the stride is shortened, the toe worn, and the heels are contracted in long standing cases. Because of the choppy, shuffling gait, a common complaint by the owner is that the horse is lame in the shoulders.

Slide - The hoof testers are very effective in diagnosing cases of navicular disease as the animal will exhibit signs of pain over the central third of the frog and over the ends of the navicular bone.

Slide - Posterior digital nerve block is also commonly used to differentiate this condition from other involvements of the foot. The horse with navicular disease will show as much as a 90% improvement in the gait following this procedure.

Slide - This shows the radiograph of a normal navicular bone.

Slide - In cases of navicular disease there may be osteoporosis enlarged vascular channels, exostosis, narrowing of the articular space, osteolysis and sclerosis.

Treatment - There is no really effective treatment for navicular disease. Injection of steroids into the navicular bursa has been advocated but the relief it produces is only temporary.

The only treatment that will give any lasting result for active use of the horse is posterior digital neurectomy.

However, in the U.S. there are numerous racetracks that do not permit denerved horses to race. Another common sequela to this condition is neuroma formation.

Corrective shoeing has been shown to be very effective in prolonging the usefulness of horses with navicular disease. In preparation for the shoe the foot should be properly trimmed and balanced. The heels should be raised by the use of heel calks or by thickening the heels of the shoe. A bar or leather pad should be used to protect the frog from pressure, and the toe of the shoe should be rolled to provide easier breakover. The branches should be slightly beveled to the outside and the nails placed more forward, these two factors allow the heels to spread thus preventing contracted heels.

In animals manifesting signs of severe pain the administration of Butazolidin is indicated.

Fracture of the Third Phalanx

This condition is usually accompanied by acute onset of lameness (the animal may pull up lame, however, in the majority of cases the lameness is observed after the animal cools out). The foot is hot, there is pounding of the digital pulse, and there is pain on application of the hoof testers. This pain may occur all over the foot, but there is usually one areawhich is more sensitive.

In cases of fracture of the third phalanx the lameness will improve with tubing, steroids, Butazolidin and rest, but will usually reoccur when the animal is put back in training.

In many cases the fracture may not be observed radiographically for the first 3 days or so following it occurrence and as such re-examination is indicated in about 10 to 12 days later.

Slide - Most fractures of the third phalanx also involve the pedal joint and as such there is usually some degree of degenerative joint disease.

Treatment - Most fractures of the third phalanx will heal with time (6-12 months) if properly handled. In these cases the foot may be used as a cast by applying a standard bar shoe with side clips near the heel - this prevents the heel from spreading and contracting. The nails should also be placed well back and the animal confined to a box stall or small paddock for about 30 to 60 days. At the end of three months the side clips may be removed, but the bar shoe should be continued. At this time the animal may be placed in a larger paddock. At the end of six months continue to

use the bar shoe, but place the nails farther forward. Progressive radiographs should be taken every 3 to 4 months to evaluate healing.

Fracture of the First and Second Phalanges

This is a common finding in the racing Thoroughbred. This type of fracture is due to twisting and compression of the phalanges at the time the foot lands.

Treatment consists of placing a plaster paris cast on the affected area with the limb in normal flexion. The cast should be left on for a minimum of 5 weeks during which time it may require two or more changes to keep it snug enough to limit movements of the bones. In recent years the use of compression screws utilizing the lag principle has been shown to be very effective in treating spiral fractures of the phalanges. The horse should not be worked for at least six months. Once healing has occurred, the foot should be kept properly trimmed and shod with a full roller motion shoe. The horse should not be worked heavily in this type of shoe, which aids in the breakover of the foot and eliminates the need for as much movement in the pastern region.

Ringbone

This is an exostosis of the first, second or third phalanges. Ringbone is a form of degenerative joint disease (a disease process of a joint where there is both osteoclastic and osteoblastic activity occurring at the same time).

Depending upon its location ringbone is classified as high or low. High ringbone involves the distal end of the first phalanx and the proximal end of the second phalanx. Low ringbone involves the distal end of the second phalanx and the proximal end of the third phalanx. Conformation also predispose to ringbone.

Ringbone is also classified as articular or periarticular, depending on whether or not the joint is involved.

Ringbone may be due to trauma, wire cuts, tearing of the collateral ligaments of the pastern joint, tearing of the attachment of the common extensor tendon from the first, second and third phalanx and displacement of the attachment of the joint capsule of the pastern joint.

In cases of ringbone radiographic examination should be obtained to determine the extent and location of the lesion which in turn will determine the type of management. Though not a common finding the extensor process of the third phalanx may actually be fractured and in the early stages this may be misdiagnosed for ringbone. However, as more and more bone

is laid down there is swelling of the anterior portion of the coronary band and a bulging of the hoof wall below the coronary band resulting in the so-called "Buttress Foot."

As far as management is concerned periarticular ring-bond respond extremely well to the use of counterirritants and rest for four to six months. Cases of articular ring-bone do not respond to counterirritants, and as such management should be different. Here the axis of the foot should be observed and corrected if necessary. The aim in these cases is to promote ankylosis. This may be done surgically by destroying the articular cartilage of the joint. Working the horse will help to promote ankylosis and this is the approach used by the majority of equine practitioners. If the animal shows signs of pain on exercise this can be controlled by the administration of Butazolidin. Once ankylosis is complete these animals will usually go sound.

Traumatic Arthritis of the Fetlock Joint

This is a common cause of lameness particularly in young horses that are in training.

With bony proliferation the condition is referred to as "Osselets" and without bony proliferation it is termed "Green Osselets."

Traumatic arthritis is usually bilateral in young horses that are in early training, or have been trained too hard, or raced too frequently.

Osselets are due to a straining or partial tearing of the collateral ligaments of the fetlock joint or dislodging of the joint capsule.

The horse should be removed from training for at least 3 weeks and the joints cooled off. After one week injections of steroids may be started. One to three injections may be required to control the synovitis. I would like to impress upon you the fact that these are anti-inflammatory only and do not substitute for proper rest - if these horses are put back to work too early the condition may recur. Results are judged by how well the swelling remains reduced following aspiration of the excess joint fluid and injection of the steroid. All injections must be made under strict asceptic technique, and counterpressure by the use of elastic bandages should be used following the injection.

Fractures of the Fetlock Joint

These fractures are fairly common in horses, and occur towards the end of a race where as a result of fatigue there is overextension of the fetlock joint which may result in tendo-synovitis, tearing of the suspensory ligament, chip fractures from the articular margin of the first phalanx and fracture of the proximal sesamoid.

There is usually swelling in the area of the fetlock, reluctance to bear weight on the affected limb. heat, pain on palpation, and reluctance to the fetlock flexion. X-rays are essential in making a diagnosis and oblique views should be taken to determine the exact site of the fracture.

Fractures of the Margin of the First Phalanx

These fractures are best handled surgically.

Slide - Most fractures of the articular margin of the phalanx occur on the medial aspect which allows better exposure of the joint than the lateral aspect.

Slides - The incision should be made as close to the fracture as possible, care being taken not to cut the tendon sheath. The incision should include the skin, subcutaneous tissue, dorsal annular ligament, the fibrous layer of the joint capusle, and the synovial layer. Following opening of the joint self-retaining rake retractors are useful in exposure and location of the fragment. The chip is then removed following which the area from which it broke is curretted smooth, and any ragged edges of cartilage removed. Following currettage, the joint is then flushed with sterile physiological saline to remove pieces of bone and cartilage which were broken off during the process of curretting the bone. This I feel is an important step which should be judiciously performed. The fibrous capsule and the annular ligament is sutured together as one layer with 00 medium chronic catgut on a swaged or needle which should not penetrate the synovial layer of the joint capsule. After the joint is closed 1 million units of cyrstalline penicillin dissolved in sterile physiological saline is infused into the joint. To infuse the penicillin a 20 gauge one inch needle is inserted on one side of the suture line. The subcutaneous tissue is then closed with 00 medium chronic catgut, and the skin with a non-absorbable type suture. The leg is supported by use of a cotton gauze combine and elastic bandage. Sutures are removed 8 to 10 days following surgery.

Sesamoid Fractures

There are 3 types of Sesamoid fractures, these are (1) Apical which are the most common, (2) Basal which are next in frequency and (3) Abaxial.

Apical fractures, especially those with separation should be removed since proper healing is extremely rare. Best results are obtained in those cases where the fracture is recent and there is no secondary exostosis.

The operative site for the removal of apical fractures is the dorsal volar pouch of the fetlock. The skin and subcutaneous tissue are incised immediately in front of and parallel to the suspensory ligament, and extend into the volar pouch. The fragment is located and excised from its ligamentous attachment, the bone curretted, and the joint flushed and closed in routine manner.

Basal Fractures - If these are left alone exostosis and degenerative changes usually occur in the area. The prognosis in these cases is very poor and only 25 to 30% of these cases return to the track.

To remove a basal fragment, the skin incision is made about 3 cm distal to the location described for removal of an apical fracture. The structures attaching the distal end of the third metatarsal or metacarpal bone to the abaxial border of the sesamoid are severed at the joint space. The branch of the suspensory ligament which passes downward and forward to join the extensor tendon should not be transected. The joint is then flexed, and the bone fragment excised. To close the incision 0 chromic catgut is used in the deepest layers for added tensile strength.

A method of internal fixation of basal fractures involving the proximal sesamoid bone was described a few years ago. This procedure does show some merit.

Tendosynovitis - Tendosynovitis or so-called "Bowed Tendons" usually result from an injury to the deep, and or superficial flexor tendon and their associated tendon sheath. This condition is very common in the forelimbs and in general the superficial flexor tendon is more commonly involved.

There are a number of predisposing factors including long weak pasterns, fatigue, toes which are too long, low heels and muddy racetracks.

The time at which injury to the tendon is most likely to occur is when the lead limb has all the weight on it when it is landing and again just as it pushes off.

According to location tendosynovitis are classified as:

(a) High - just below the carpus - these do not respond well to treatment and involve the tendon sheath.

(b) Middle - these occur in the middle third of the cannon bone. In this area the tendon lacks a definite tendon sheath, and as such the condition is primarily a tendinitis. With this type there are usually adhesions between the tendon and subcutaneous tissues.

(c) Low - these occur in the lower one third of the cannon bone and include the volar annular ligament.

Tendosynovitis may occur in the high or low areas alone, but it usually does not occur in the middle alone, and in severe cases all areas may be involved.

Symptoms observed in bowed tendons may either be acute or chronic. The acute form is manifested by severe lameness which will cause the horse to stand with the heel raised and the carpus flexed. The affected area is usually swollen and heat and pain are evident. In the chronic form there is usually some fibrosis in the area of the original injury. Heat, pain and lameness vary according to the degree of healing. Palpation of the affected tendon will usually reveal a firm, prominent swelling. With chronic tendosynovitis some animals will be sound at the walk and at the trot, but they will go lame with hard work.

As far as treatment is concerned the application of cold water to the affected area is always indicated in acute tendosynovitis. A more recent procedure used in treating these acute cases is to inject a steroid subcutaneously, and into the tendon and tendon sheath. Multiple injections of 1/4 to 1/2 ml of the steroid are made with a 23 gauge, half inch needle throughout the length of the injured tendon in a symmetrical pattern with injections about half inch apart. Following injection of the tendon the leg should be placed in a light plaster-of-paris cast extending from just below the carpus to the coronary band. Parental steroids may be used in conjunction with the initial local injections for up to 10 days. The cast should be removed in two weeks and in most cases the leg will appear normal. If necessary, however, another cast may be applied for an additional 10 to 14 days. Following removal of the cast the limb should be placed in supporting bandages for another 30 days. These horses should not be put in training for at least 6 months.

Dr. R.C. Robinson in Victoria, Australia has reported excellent results with the injection of the sclerosing agent ethamoline (5% monoethanolamine maleate-Glaxo-Allenbury) into the tendon after the inflammation has subsided, together with raising the heel.

In those cases where the tendon is swollen and the fetlock sore and distended with fluid, cutting the volar annular ligament give good results.

The treatment of chronic tendosynovitis is still very discouraging. The latest figures disclose that even with new methods of treatment only 35 to 40% of the horses treated returned to their former racing form.

Surgical treatment of chronic tendon injuries by radical longitudinal incision has been used by many practitioners and so far appears to give the best results. The procedure most commonly used is Ascheim's tendon splitting technique. With the horse under general anesthesia the tendon is exposed by a longitudinal incision; the affected portion of the tendon is then split longitudinally with a single incision extending 2 cm into normal tissue following which the peritendineum is sutured and the incision closed. Another method is the percutaneous splitting of the tendon. This operation may be performed on the standing animal following local nerve blocks (Ulnar, musculocutaneous, medial and lateral volar). In this procedure the skin is punctured with a double edged knife and a fan shaped incision is made alternately on the medial and lateral aspects of the tendon along its entire length. The surgical area is then dressed with an antibiotic powder and the leg may either be wrapped with cotton gauze combine and an elastic bandage, or it may be placed in a plaster-of-paris cast.

Periostitis of the Third Metacarpal

This condition is also referred to as "bucked shins", or"sore shins". It is commonly seen in young animals and is usually bilateral.

Concussion in an immature animal is the factor that is primarily responsible for this condition which is rare in horses over three years of age unless it occurs as a result of direct trauma.

In buck shins the periosteum is usually torn away from the anterior distal two thirds of the metacarpus with hematoma formation between the periosteum and the cortex of the bone.

In these cases there is heat, swelling and pain on the anterior surface of the cannon bone. Since both legs are involved the horse travels with a short choppy gait, with the lameness increasing with exercise. We have begun to take radiographs to rule out the possibility of compression micro-fractures (March) which may produce similar symptoms. In long standing cases radiographs will reveal marked thickening of the cortex of the bone.

Rest is the most important consideration for a complete recovery. The use of poultices and cold packs during the first 24 to 48 hours after the onset of symptoms is indicated to decrease the acute inflammation. This is followed in 10 to 12 days by the application of a medium or strong paint or blister and the results are very good. In long standing cases thermal cautery in the form of pin-firing give good results. The animal should be rested for at least 3 weeks before being put back into training.

A more modern method of therapy is the subcutaneous administration of a corticosteroid along the injured metacarpi, following which the leg is wrapped with cotton gauze combine and an elastic bandage. Animals treated in this manner respond dramatically but they should not be put back into training until 30 days following the injections.

We feel that those cases that reoccur during training are due to insufficient rest and as such we try to stress the importance of this to the trainer.

Splints

Splints or periostitis of the second or fourth metacarpal bones with inflammation of the interosseous ligament is a disease of young horses up to 5 years of age.

In the forelimb, the medial splint bone is more frequently affected, while in the hindleg the lateral is more commonly involved.

There are a number of factors which predispose to splints, one of the most common being conformation. Horses that toe out, as well as, horses with bench knees place more stress on the medial splint thereby predisposing to injury. Other factors include age and nutrition (def. of Vit. A,D or Ca:P imbalances).

Most splints appear near the middle third of the bone. Knee splints occur in the proximal portion of the bone near the carpus. Usually when the distal third is involved one should suspect a fracture.

Typical splints are located on the lateral aspect of the bone. Blind splints, however, are located on the inside of the splint bone. As such in order to palpate a blind splint you must palpate behind the suspensory ligament.

In general, splints are easy to diagnose. In our clinic however, we take radiographs to rule out possible fracture, as well as, to determine whether or not the lesion is active. In cases where we suspect blind splints we inject a local anesthetic over the area to determine whether or not the gait will improve.

The injection of a steroid in the splint area along with bandaging will result in temporary improvement, but the condition will recur if the animal is not given adequate rest. A very common treatment which is still used today consists of cooling the leg off for 10 to 14 days and either blistering or firing the area.

We recommend a minimum of 4 to 8 weeks rest following blistering or firing and at least 8 weeks following the administration of steroids.

Fracture of the Splint Bone

Fracture of the splint bone usually involve the second metacarpal bone and is due to the opposite foot striking the bone.

Some sequelae to fracture of the splint bones include

a. Sequestration - due to necrosis of a piece of bone that has separated from the main shaft.
b. Non-union
c. Excessive callus formation
d. Desmitis of the suspensory ligament

If the splint bone is healing as shown by radiographic examination, usually we do not disturb the condition, providing no lameness, swelling,or pain are present. If the fracture has been present for some time and shows no signs of healing it should be removed since healing often occurs more rapidly following surgical removal. Most trainers and owners usually request removal of a fractured splint as soon as possible after the fracture has occurred rather than waiting for healing to occur.

(Slides on surgical procedure)

Carpitis

Carpitis refers to an acute or chronic inflammation of the carpal joint which often involve the joint capsule, the associated ligaments of the carpus and the carpal bones. Initially the condition is a serous arthritis which later progresses to an osteoarthritis involving the margin of the carpal bones or the joint space.

Acute carpitis is characterized by heat, swelling, pain and distension of the joint capsule which may involve the radial carpal and or intercarpal joints.

In subacute or chronic cases there is only swelling or filling of the joint. In these cases, however, pain can be accentuated by carpal flexion.

Diagnosis is based on carpal flexion, palpation of the carpal bones, intra-articular injections and radiographs. Proliferative changes are not observed radiographically until about 3 weeks after the injury has occurred.

Treatment: the acute serous form of arthritis responds extremely well to the injection of corticosteroids into the joint. Three injections of steroids, approximately one week apart give excellent results. Following steroid injection the carpus should either be bandaged with a many tailed bandage or immobilized with a plaster-of-paris cast or fiber glass cast which should be left in place for two weeks and the horse rested for a period of at least 4 months.

The greatest difficulty in treating carpitis with steroid injection is that the relief produced by the drug allows the owner to use the horse too soon resulting in re-injury.

In those cases where there is new bone growth that is not encroaching on the articular surface of the bone point firing along with application of a good leg pain and rest for about 6 months usually give favorable results. In severe cases where new bone growth is encroaching on the articular surfaces of the bones the prognoses is very unfavorable and the results of firing is not as good.

Fractures of the Carpal Bones

This is a very common cause of lameness in racing thoroughbreds.

These fractures are due to trauma, and from the location of the fracture overextension of the joint appears

to be the most common cause as it places great stress on the anterior face of the carpal bones and radius and as a result, portions of these bones may break off. Depending on the size these may be classified as "chip" fractures or "slab" fractures.

Conformation is also an important feature which may predispose to carpal fractures. Horses with "calf knees" are more likely to be affected.

Fractures of the distal end of the radio-carpal bone is the most common and comprises 2/3 of all fractures of the carpus, and is followed in frequency by fractures of the 3rd carpal bone. Other bones which may be involved include the distal end of the radius and the intermediate.

Radiographs are necessary to confirm a diagnosis of carpal fracture as well as to determine the exact location of the lesion.

Surgery is now the method ofhandling carpal fractures. The intra-articular injection of corticosteroids into the affected joint should be avoided. Horses which have been subjected to intra-articular injections of corticosteroids should not be operated on until 4 to 6 weeks following the last injection.

(Slides on surgical procedure)