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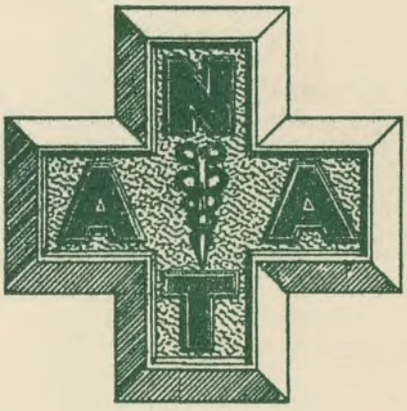

9th ANNUAL MEETING, MIAMI BEACH, FLORIDA

SHOULD REINJURY-POTENTIAL FOLLOWING POST MENISECTOMY BE A MAJOR CONCERN TO THE COACH AND TRAINER IN RETURNING THE ATHLETE TO COMPETITION ?

by
Karl K. Klein, FACSM, CCT
Assistant Professor Physical Education
University of Texas

An effort to develop the rationale for a problem of this nature offers many facets for possible discussion and it is with this thought in mind that an effort will be made — to point up the issues from the standpoint of the more common injury situations.

By and large the injury incident is to the medial meniscus with or without medial ligament involvement. There are two distinct conerns that have to be considered in the recovery period one dealing with the redevelopment of the muscular support of the knee and the other dealing with the involved ligament. Although the basic reconditioning procedures are similar for both types of cases the **end result will vary from the standpoint of additional education of the player involved with ligament weakness as** he goes back to the competitive aspects of the game.

For a period of over twenty years knee injury has been the major problem of concern for the player, trainer and coach. During this time surgical procedures developed to the point that it is an exeception to the rule that future competition is contraindicated for the player, so once the successful surgery has been completed the major problem of reconditioning is the issue of importance and it is in this phase of the recovery period that determines the degree and amount of successful competition the player will participate in. It is interesting to note that during this same period of time of improved surgical methods so have the methods of physical restoration and muscular rebuilding. The advancement has been from swinging the leg with a sand bag or two, running up and down stadium steps, just quadriceps exercises, deep knee bends and other non-specific exercise programming to the application of various forms of Progressive Resistive Exercises that are progressively incremented gradually and steadily to increase the strength of the muscular groups that support the entire knee structure with basic consideration being given not only to the quadriceps but the hamstrings as well as the gastroc. Even though these latter systems of exercise are scientifically proven and accepted it is also to be noted that some involved in this concern are apparently unaware of such modern concepts and are still using methods that are undoubtedly responsible for the reinjury incidence.

Postmenisectomy with no complications

Unless a person has never been exposed to an operation of this nature it is almost impossible to realize the rapid deterioration of the muscular groups that support the knee. The degree will vary from individual to individual but the drop off in actual measured strength loss for the **quadriceps and hamstrings** in the average individual is well over 30-50 percent. During the first ten days to two weeks some strength loss will be recovered through exercises and early ambulation will gradually restore some of the loss **but far from the maximum protection needed for competition.** It is at this point that the use of acceptable exercise systems are needed to restore pre-injury function and beyond for added protection. Restoration to fair functional use is a relatively easy matter and many times the individual feels "ready to go" before he has gained the necessary protection according to the progress in the exercise program. Of course the pre-exercise motivation for exercise regularity is important to the player and is his insurance against potential of reinjury. If adequate exercise planning is made for the post-operative period it is necessary that systematic progressive scheduling be established for a **period of six to eight weeks,** following the first seven to ten day period. According to therapeutic application studies of post knee injury cases the rebuilding to a high level of muscular balance and protection can be gained in tthis period of time. According to available information the individual differences in capacity to redevelop muscular strength is the reason it is impossible to set the same time limits for all but the above stated period will cover adequately the majority of cases dealt with. **This time limit is also based on systematic progressive resistive exercise application and not** on just any type of weight exercising that hasn't been thoroughly and systematatically applied. It is this type of inconsistent application that increases the recurrent injury incidence when the player is returned to the competitive areas with less muscular protection than he had before injury. With systematic programming, the average player will have time to rebuild to a strength level beyond that at the time of injury in an eight to ten week period post-operatively.

During the reconditioning period the player should be encouraged to do some running on smooth surfaces and in the latter period running with cutting and on some rough surfaces. Caution should be stressed here because relatively good muscular development is necessary adequately to support the knee under such conditions.

In the total reconditioning of an athlete as discussed in the foregoing situation there is no reason why he should not be able to return to competitive sports with the same security as the individual that has not been injured and his chances of recurrent injury will probably be lessened because of the additional muscular strength and protection that has been developed from the planned progressive resistive exercise.

In the case where specific exercise planning has not been taken into consideration the athlete is prone to reinjury because of the structural insecurity of the knee due to lack of adequate muscular support. There is an added factor of anxiety springing from a protective attitude which lessens playing ability because of an inner fear of the potential of reinjury. These things keep him from his total functional ability and capacity. Case study after case study indicate that inadequate reconditioning following post-menisectomy can be classified as the predominent factor in re-injury. Time alone is not enough to restore muscular function, it just does not rebuild adequately without guidance and direction and specific programming. The doctor alone can not solve the problem in this case but needs the cooperative efforts of the coach and trainer.

(Continued on Page 2)

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SHOULD REINJURY —

(Continued from Page 1)

Post-menisectomy with weak medial and/or lateral ligaments:

Even though the ligaments are not considered as primary supporting structures of the knee they do offer some protection against the components of force than can be applied against the joint and as a result offer some protection against lateral hinging (abduction) and rotational action of the joint. The strong ligament will give the knee enough momentary support when "hinging action" takes place and propioceptive stimulus is given and the musculature action of support is to late to prevent the I. e. further ligament damage and additional internal derangement. Other ligament weaknesses are also related to the potential of further knee injury problems in a similar manner according to the forces applied. In other words, although the knee can not be entirely dependent on the ligaments for total structural support they do have enough stabilizing influence to add security to the joint before the musculature takes over for maximum stabilization of the joint.

The athlete with known weak ligaments is by far more susceptible to knee injury either by forceful contact or rapid changes of direction, without contact, because the continuity of action between the tibia-femur will have an abnormal range of motion that is more difficult to control by muscular action. This person's only security after the operative procedures to remove the cartilage rests in the adequate carrying out of the progressive resistive exercise program and the development of "specific habit patterns" of action in the practice or game situation. This development of specific habit patterns has to deal with the educational factor mentioned previously as the one additional item of importance when this type of problem is present. There are two such patterns, that will add to the total protection against possible injury:

1 — Never to relax as long as there is play in progre.ss. Often a player will relax aftercompleting his assignment and becomes unsuspected prey to the defensive man who is still in motion. During this moment of relaxation the musculature is in a "non-protective state" and forces applied against the knee or thigh revert to the supporting ligaments which are not capable of supporting against sudden traumatic force. The result is injury or re-injury.

2 — Anatomically and structural studies of the knee show that the joint is more stable the closer it approaches full extension. Especially if extension action of the joint is the movement in application when the foot is in contact with the ground in the last twenty degress of extension. During this action the quadriceps and hamstrings are acting together to exert a combination of approximately ninteynine (99) percent of muscular action to stabilize the joint. At the same time the ligaments also are in a more active state of functional protection to the joint and the rotational phase of he tibia on the femur is reaching a more stable position for knee security. In the situation of weakened ligaments the knee is more dependent on the strength of muscular action to support he joint against th applied forces

(Continued on Page 12)

DRY HEAT TECHNIQUES

By Bob Grant, RPT, Purdue University

May I point out that I do not wish to enter into a discussion of the issue of dry heat vs. moist heat as I feel they both have their place in injury therapy. Dry heat has long been used in physical injury therapy and justly so as heat is a good analgesic agent and a strong vasodilator. When heat is applied locally, first a local dilation of superficial vessels takes place, then a general vasodilation of all superficial vessels takes place plus sweat gland activity; then and only then does vasodilation take place in the depths locally and that is our aim — when this is understood local hyperemia and general perspiration should not be alarming.

After our team physician has indicated his desire the technique of application is in our hands. This is a serious responsibility and one not to be taken lightly. Short Wave and Microwave diathermy in the hands of a skilled operator can be of great benefit to the injured boy. Now the simple question arises when dry heat has been ordered how is the best and simplest way to induce it.

I. RULES

A. Follow the team physician's prescription to the letter.

B. Patient comfort is my first consideration i.e. I make my patient as comfortable as possible.

C. Instruct my patient to remain as still as possible.

D. My patient is to call me at the first sign of intolerable heat (and in the case of s.w. dia. to pull the safety cord which has been placed within patient's reach).

E. On cool and cold days instruct my patient to remain inside at least ten minutes after treatment.

F. I keep a record of the diagnosis, treatment (time and type) and patient progress.

G. Never operate electrical equipment with wet hands and of course **every unit should be carefully grounded.**

H. The heat sensation of the patient is the supreme guide of dosage in all diathermy treatments.

NOTE: Strong currents cause a reflex vasoditation of the heat regulating blood-vessels and this excess heat can be led away. Weaker currents, on the other hand, applied over long periods cause considerable deep heat effects without stimulating the reflexes to excess.

I. Attend the patient closely for first few minutes because it will probably be necessary to reduce the power after heat begins to build up.

J. Never apply excessive heat over a bony prominence (condyle of femur) or excessive adipose tissue because these two types of tissue are the most resistant to high frequency current. Skin and muscle tissue offer the least resistance.

K. Do not give a diathermy through an adhesive strapping or through metal (such as clips on clothing) or through clothing, also beware of the patient who may have shrapnel or other metals in his body.

L. Don't "cross your wires" — always check the lead in wires — do not cross them or allow them to touch the patient.

II. TECHNIQUES OF APPLICATION

A. Short Wave Diathermy —

a) Hinged Treatment Drum —

When using the drum applicator, I always apply a towel of rather light texture which measures about 14 x 20, this is used for sanitary reasons and to absorb perspiration and is applied between the applicator and the patient. The drum fits the contours of the back and extremities very nicely and is applied sung but not too tight. To reduce power to patient use proper controls, do not space drum away from the part to reduce heat.

b) Air Spaced Plates —

These are used for and are particularly effective in the "long path" treatments; namely hip to foot, and shoulder to hand. Usually two inches of total spacing between the space plate and the plate guard is the rule for most efficient operation. This spacing can be divided unequally for the purpose of localizing heat — for example ½" spacing under one plate and 1½" under the other, this technique is of value in applying heat to the lower leg and fore-arm musculature. I have used the space plates for the so-called "box-ankle" and "box-elbow" techniques whereby one plate is placed on the distal side and one on the proximal side of the joint. The space plate method is also useful to localize heat in the hard to treat regions of the body by placing one plate in contact with the patient and the other plate actually away from body contact; simply by moving the plates until the patient feels heat in the area of trauma.

c) Pad Method —

The pads operate on the same principle as the air spaced plates. Again the spacing is important by means of felt spacers and turkish toweling placed between the pad and the patient then the felt spacer then the pad. Pads are always applied as symetrically as possible. Here again localization of heat is possible by different spacing such as in the wrist and groin regions. I have used the pads about the wrist when s.w. dia. has been ordered for tendinitis and tenosynovitis.

d) Utility Applicator or Cuff Electrode —

This accessory applicator is used for torticollis and myositis of the cervical musculature very nicely. Again a turkish towel is placed between applicator and patient. The dispersing electrode can be either a pad or air spaced plate. The particular advantage of this applicator is that it can be shaped to fit any area of the body topography.

e) Inductance Cable Method —

Since advent of the hinged treatment drum the cable method is rarely used and is practically obsolete. I will not discuss it except to state that those of our members using it certainly are familiar with it and to the new men bear in mind that adequate toweling and wood space slips are essential for patient protection so as to keep the cable free from itself and the patient.

B. Microwave Diathermy —

This is a post-war high frequency apparatus of great value in administering localized heat to a small area. I am of the opinion that it is a valuable companion to s.w. dia. and not a replacement for it. This machine is well suited for efficient heating of a circumscribed area and because its more uniform absorption rate is compared to Short Wave,

it may avoid over-heating of superficially localized tissues. Special care is advised when treating about the head, never point the directors at any area above the inferior border of the mandible (microwave has experimentally contributed towards cataracts in the eyes of animals).

This machine offers four directors — namely ABC and D which are attached to the coaxial cable lead from the machine, and suspended from a retractable arm resembling a dentist's drill. The A and B directors are circular in construction. The C is ovate and the D is a long narrow ovate type. I find the A of value in treating the apex of the shoulder and the posterior cervical muscles, the B over the trapezious region where the bony prominence of the scapula may not permit good s.w. dia. application adn for sacro-iliac localization. The C director is used in an area such as the thenareminence and the area just superior to the gluteal fold (sacro-coccygeal articulation); the D can be used in a long path such as over the vertebral column.

The RULES I follow are the same as A,B,C,D,E,F,G,H, and J, for s.w. dia. also allow the instructions clearly stamped on the control panel of the machine to be **your guide.** Always exercise sensible caution after following the above suggestions whenever using the microwave machine, also never touch the patient with any of the directors. The ruled guide which is screwed on to the directors will aid in preventing this from happening.

C. **Infrared Radiation** —

There are many, many types of non-luminous infrared lamps available. Also many types of "baker" units equipped with incandescent bulbs are in use. Infrared radiation, on account of its comparative simplicity and safety of application is preferable to diathermy in many conditions when efficient heating of structures not too deeply situated is desirable. No hard and fast rule exists which would make the selection of a particular for mof heating imperative in a given condition.

I never place an infrared lamp closer than twenty inches from my patient. Do not be alarmed at the hyperemia that results and the perspiring that takes place locally as this occurs during the applications of all heat especially infrared. I usually apply this type of thermal application whenever a large area of the body is in need of heat and when the prescription is to give a thermal application.

In summary may I state that if any burns occur from the application of thermal modalities, it is in all probability due to the patient's desire to take a lot of heat "because it is good for me" so warn against this. If a patient states that he did not feel a lot of surface heat I feel an explanation as to the deeper penetrating properties of high frequency medical equipment is in order. The time limit on all of the thermal treatments I administer is twenty minutes unless otherwise ordered by the team physician. If the condition does not respond to treatment after four treatments, I feel it is wise to have the patient seen by the team physician as he may wish to evaluate the injury again and request a different type of therapy.

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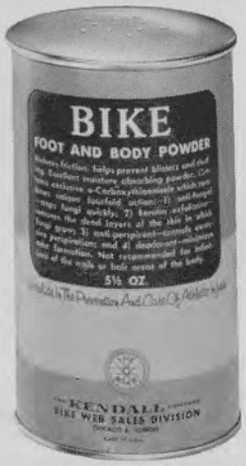

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THE IMPORTANCE OF "WARM-UP"

A. D. Dickinson, Iowa State Teachers College

When a coach or trainer tells a boy to "warm-up," the latter accepts the assignment with a vague notion that a certain number of twists, bends and a few steps or two will get him ready for hell or high water. The athlete probably has never given a thought to the reason why he should warm up or what takes place when he does. It is bad enough to get college and university boys to warm up properly, but the high school boy, — the beginner!!! These athletes are firmly convinced that anything beyond two minutes of pre-exercise activity is not only a great sufficiency, but a means of tiring him out more quickly and they want no part of it. So he accepts the order of the coach as stoically as if high jumping with a short run had been prescribed.

The warm-up not only assures the athlete that he will do the bulk of his work during his optional performance plateau before he tires, but that it also increases his margin of safety for the emergency demands of athletics. Certainly track falls in this category.

There are two approaches to the problem of warming up — a physiological and a psychological one and both must be included. In order to take advantage of the protective mechanisms with which the human individual is endowed, certain procedures should be followed so that the systematic adjustments which are necessary for the safety of the athlete follow in logical sequence.

These physiological adjustments involve most of the systems of the body. The athlete starts his warm-up slowly. Activated muscles throw a small increase of lactic acid and carbon dioxide into the blood stream. There is a resulting stimulation of the heart centers, increasing both rate of beat and stroke output. Muscles demand from four to eight times more blood during severe exercise. Thus the cardio-vascular system starts assuming this terrific responsibility. This same hormonic action of lactic acid and carbon dioxide also activates the respiratory centers and the rate of respiration is quickened and ventilation is deepened. The vaso motors centers are stimulated. Selective vaso-dilation and vaso-constriction re-directs blood from inactivated areas to the skeletals. As the vessels are dilated, a washing out of the blood from stagnated areas further increase the number of red corpuscles adding to the oxygen carrying capacity of the blood. Return circulation is further speeded up by changes of position and by the massaging action of exercised muscles. This return increase serves to stretch further the heart walls, resulting in a still greater stroke output. If the warm-up is equal to the energy used in running a mile in five minutes or so, the spleen constricts, dumping out great quantities of red corpuscles. But even with this added oxygen carrying increase, it is still an impossibility for the cardio-vascular system to take care of oxygen needs.

Naturally, there is a temperature increase. This continues until the sweat glands are thrown into action in an attempt to keep rapidly rising temperature to within the range of toleration. Heart regulating centers are sensitive to temperature increases, further stimulating this organ to greater activity. It attempts to keep pace. Certainly, unless temperature regulation took place, good performance could not last long under this stress.

Through the warm-up, irritibility of muscle is increased and responses gradually reach the optional point. Batteries of impulses impinging upon the motor nerves with increasing intensity, reaching more and more of the muscle fibers. Co-ordinations are sharpened. The muscles become ready for the emergency demands put upon them by the athlete. Thus, through the cooperation of the various systems of the body, the cardio-vascular system begins the impossible task of attempting to satisfy the oxygen demands of muscles in action. Possible strain is cut to a minimum by giving the systems involved in the preparation of utmost effort, time to adjust themselves.

Even the far-away liver, worried by the depletion of blood sugar, helps out by converting stored glucose to glycogen for immediate use. Chemical changes within the muscle cells seem to stabilize themselves in an attempt to operate in a steady state. Buffering, re-synthesis and reconversion, is at its best for a time. And during this time the athlete performs his best. But even so, it is impossible to supply oxygen fast enough and gradually even the lactic acid which in its minimum amount serves as an aid to the athlete, piles up. Metabolic imbalance becomes more and more evident and the sprinter, hurdler, miler, weightman, vaulter and jumper begin to tire. But he would have tired much more quickly had he not warmed up properly. It is a matter of physiology, and training and the warm-up, are the only factors which can delay the outset of fatigue.

There are psychic changes also. If the boy becomes emotionalized, the output of adrenalin increases, the sympathetic nervous system is stimulated with the resultant augmentation of the work of the circulatory, respiratory, vasomotor and muscular systems. He may be able to dip further into his reserves for greater feats of strength and endurance. This adrenalization may or may not be a good thing. In fact it may prove to be the undoing of the athlete. Emotional stability and prevention of tension should be a part of his training.

It is noted that the hyper-nervous boy will warm up faster than the opposite type. The high strung boy needs definite schooling on the amount which he does before his event.

It is interesting also, that the partially trained individual will come up to his performance peak much more quickly, and that his plateau will not be as long as that of the trained. His preliminary work then, must not be over done, or his fatigue level will be reached before his event is completed. The problem, then, is to give the proper dosage of warm-up, and then the correct prescription or work to follow. This is partially an individual proposition. It cannot be the same for all. We want the coordination of fibers within the muscle to be exact, and the nicety of the timing of the action of the antagonists to cut to a minimum the hazards of muscle rupture. The athlete must depend upon the warm-up to insure the integrity of antagonistic action.

To summarize, the warm-up is an attempt to get all the systems of the body to the point of adjustments necessary for strenuous exercise; to minimize the chance of injury, muscle or organic strain; to relieve the body of tension; to alert the nervous system for its job and to give the boy the feeling of confidence that he is ready to do his best in the performance of his event.

HEYPERVENTILATION

by
Fitz Lutz, Deceased
Former National Director N.A.T.A.

Definition:
Excessive breathing, over breathing or forced breathing.

Cause

1. **Voluntary.**
   This kind of hyperventilation can be produced by the individual forcing all the carbon dioxide from the body until alkalosis with tetany is attained.
2. **Involuntary.**
   This is the type of hyperventilation we as trainers are most interested in, and on which the case history below is based.
   There are several causes of involuntary hyperventilation.

1. Diminished oxygen concentration. (High acidity.)
2. Increased need of oxygen. (Due to exercise.)
3. Acidosis from muscular activity, congestion of inorganic acids or highly acid food. (Protein.)
4. Most particularly, change in the reaction of the blood.

When change of reaction is due to the acid side, you have a marked hyperventilation. This is usually regulated in a short period of time by oxygenation of lactic acid.

Sometimes under emotional stimulus the breathing continues beyond the plane of neutralization of the acids. Here is where we find an alkaline reaction takes place in the blood, because of CO2 being expended. This reaction in the blood produces the unusual symptoms listed below.

Symptoms.

Breathing rapidly, (can't get enough air) which, in reality, he has too much of, and by rapid breathing, is expending what carbon dioxide reserve he has.

Blood pressure at first will be high as in muscular activity, pulse will be strong. As time goes on you will find the blood pressure will drop, sometimes to the shock level. The pulse may become thready but not in all cases.

The skin will be cold and clammy, numbness will be noticeable around the lips. There will be marked tetany of the extremities, i.e., fingers, wrists, and arms will be drawn rigidly towards the sagatal line. This is due to a chemical reaction and because of the flexors being stronger than the extensors.

In this condition the patient could possibly go into collapse, and/or unconsciousness. If this condition were present, nature would regulate the patient's breathing back to normalcy.

Treatment.

Break the cycle by asking the patient to resume normal breathing, 18 to 20 times per minute, or to hold his breath as long as possible. If neither of the above methods seem to be beneficial place a paper bag over his face. This method insures him of breathing pure carbon dioxide and will restore the correct balance of oxygen and carbon dioxide needed for normal breathing and establishing normal relationship of acid and alkaline.

The greatest aid to be given is an injection of 10 cc. of 10% calcium glutinate.

Complications.

The only complication noticeable will be soreness of the muscles due to tetany.

To our knowledge there has never been a fatality due directly to hyperventilation.

Time Incident.

Usually sets in after strenuous exercise. The reason being that during exercise the muscles give off enough lactic acid to counter balance the alkaline content. Calcium content in the blood is the major factor in combatting hyperventilation.

Case History of Hyperventilation of a Track Athlete.

During our experience we have come in contact with this malaise only once. This was last spring. A track man, during practice, ran two fast 220 yard dashes with only five minutes rest. After a slow jog around the track in sweat clothes, he went in.

While showering and dressing he continued to breathe fast, the time elapsed between the end of the work out and dressing should have bee nenough to restore normal respiration.

However, after twenty minutes had passed the boy's breathing had become faster and deeper. Our attention was called and upon examination we found the face and body cold and clammy, tetany had started, and pulse was thready. We took the patient to the University Infirmary where his condition was diagnosed as "Overventilation."

Treatment consisted of getting the boy to relax, concentrating on trying to establish a normal rate of breathing. This was accomplished in about twenty minutes and he remained in the Infirmary over night for observation. There were no complications other than muscle soreness from tetany. Blood pressure, pulse, and respiration were back to normal when he was released. This boy returned to practice three days later and had no recurrence for the remainder of the season.

We have never observed this type of respiratory affliction in any other sport, however, it is prevalent at high altitudes and in hysteria.

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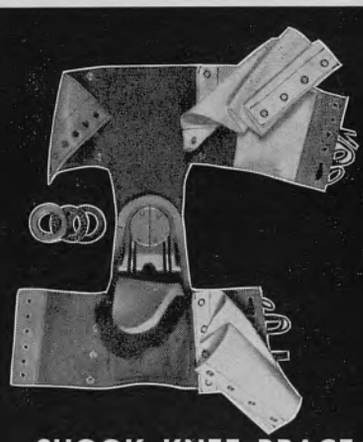

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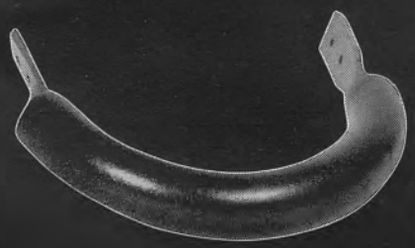

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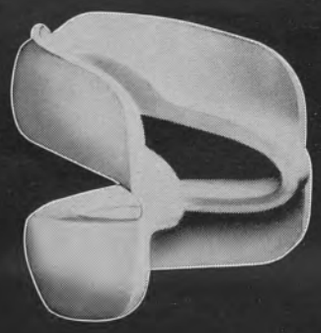

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or

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In reckless zest of faroff youth
I faced the North wind's bitter bite
And blasted Boreas' wintry gale
With nitrogen metabolite.
Then came the fateful fifties
With what they call retention
'Twas hard to start and hard to stop
Plus ptosis from distention.
I thought that I should never see
A stream of urine quite so wee
As that impelled by prostate gland's
Senescental hypertrophy.

Then doc, you placed me on my back
You reamed my sphincters, stretched them well
You pushed things in and pulled them out
And gave my old urethra hell.
And now the sun shines in the sky
The birds sing in the trees
My life is mine to live again
I urinate whene'er I please.
All hail to you, urologist
Purveyor of ecstatic bliss
The fount of youth for me you've found
As joyously, triumphantly, I ————

— LAVIK

SHIN SPLINTS

by

Weaver Jordan, Baylor University

Shin splints usually occur in track with the runner on a hard track using long spikes or in basbetball or football during the early season before the athlete is in condition. Shin splints is an inflammation of the interosseus tissue in the lower leg and is quite painful. It is also thought to be a lowering of the medical longitudinal arch. Shin splints is undoubtedly caused by unaccustomed or unusual exercise, such as running, pounding, jumping, over stretching, or over working. There are four tendons which are a large factor in this matter, the Tibialis Anterior and Posterior, Extensor Digitorium Longus and the Exterior Hallucis Longus. The tendons of these muscles are enclosed in separate synovial sheaths. The theory that shin splints is due to an actual avulsion (tearing away) of some of the tendon fibres from their origin is not tenable. This condition develops too easily and is quick to respond to rest and treatment to warrant such a theory.

The deep Peroneal Nerve arises just a little below the outside edge of the knee cap and descends the length of the calf just under the Tibialis Anterior muscle. Movement of this muscle is often thought to irritate the Peroneal nerve and consequently trainers quite often tape up the calf to restrict the movement and thus alleviate as much irritation as possible.

"Running out" shin splints is definitely not the cure. In fact, there may develop scar tissue which cannot be absorbed.

There seems to be a general agreement that the Interosseus Membrane, which is the tissue lying between the Tibia and Tibula, is the cause of shin splints. Upon irritation of this tissue, it seemingly spreads to the surrounding muscles and tissues. Since the anterior muscles lie beneath a shallow skin surface, they are thus pressed closely between the skin and bone making it harder to warm up these muscles and easier for them to cool off.

The Interosseus Membrane has two functions. It stabilizes the bone structure of the lower leg by providing a "buffer" between the Tibia and Tibula. In addition, it serves as an added attachment for the muscles of the area. Due to poor circulation the blood supply is very limited. Not only do at least six of the anterior skin muscles have the Interosseus Membrane as a source of their attachments, but also do the Gastroceius and Soleus of the calf. With this much "pull" and "jerk" being applied to a tissue that has relatively little blood supply for the removal of waste materials and supply of nourishment, is plain to see why such an area can develop irritations.

Taping of the area definitely does relieve some of the pain and stress in most cases. Whirlpool baths should be taken several times a day and hot packs (analgesic) should be used overnight. As much heat should be given to the area as possible due to the poor circulation as previously stated. The calf should be strapped high but done with elastic type bandage (Elasticon or Elastoplast). Some trainers haev found that a long piece of sponge placed over the lateral or medial border of the tibia and then bound in place by the elastic bandage helps to hold the calf muscles in place while working out. Movement of the calf muscles will jar the interosseus membrane and thus the reason for the strapping of the calf. Make the track boys stay on the grass for ten days and avoid the hard surface of the track. Being overweight can also cause a great stress and the arches and induce shin splints. Get your heavy one sport boys to diet and lose weight before attempting early season training. A piece of sponge under the heel will also relieve some of the shock of the calf muscles. This raises the heel and if the cause of shin splints is in the calf muscles, the stretch of these muscles is limited. There may be a chance also that one leg is shorter than the other and here again the heel life is employed with the sponge. Heat to the lower back will also stimulate blood circulation to the legs.

SHOULD REINJURY —

(Continued from Page 2)

so the following suggestion is made in an effort to reduce re-injury potential. This action necessitates the development of a "habit pattern" of reaction at the time of applied lateral force to the knee. During the state of motion and at the point of contact when the foot is in contact with the ground an active effort should be made to extend or straighten the knee while giving with the force. **If this action effort is made the knee will gradually be placed in a more actively protected position** during the final twenty (20) degrees of extension and therefore will have increasing muscular and ligament protection. Also, after the ball carrier is tackled and is rolling with the force, straightening effort should be made to reduce the twisting force of the tibia on the femur, thus protecting the ligaments and other internal structures. This is an abnormal action and one that normally would have to be developed as a result of practice. Of course if the player is a back or end this action might be thought to slow forward progress but the forceful knee straightening action only is used when the contact is such to stop the forward action. If the player is in the line the technique would be applied when the contact is enough to stop forward acoitn and is an angle of force against the knee or thigh.

Ligament structure is non-elastic substance and the problem of reducing a stretched ligament of the joint has to be recognized early enough so that steps may be taken to allow it to heal and possibly return to its normal length. This can only be handled by consideration reduction of functional use for a set period of time that is to be determined by the team physician. Following this period progressive exercise should then be applied. Such injuries are often not recognized early enough so that treatment will be of value. The end result is weakened ligament support. It is possible to strengthen ligaments during the process of progressive resistive exercise, **thatis normal ligament structures,** but difficult if not next to impossible to strengthen a ligament through exercise that has been previously stretched as a result of injury. Under test situations the ligaments may appear to be strengthened after exercise programming but when the musculature is put into a relaxed state the true status of the ligaments can be measured and once stretched it is very likely to continue to give signs of such condition. The use of Manual tests for such purposes are the acceptable procedures.

In cases of this nature it is very likely that more time should be spent in the muscular re-development problem in an effort to strive for maximum muscular protection and knee stability.

Conclusions

It is reasonable to assume that the processes of operative procedure, resulting in the removal of a part of the structure that serves a purpose of stabilizing, that the end result will tend to weaken the integrity of that body part. Along with this process as in the cases in question, there will be accompanying muscular deterioriation **that needs first consideration** in the restoration processes. If these factors are recognized then the pattern is determined that is necessary to follow in the process of preparing the athlete for return to successful competition.

Through the processes of adequate progressive resistive exercise and education through "habit pattern," development, for the cases with weakened ligaments, there is every possibility that the player will return to relatively injury free competition. Without such consideration there is a high potential that the player will again be injured with added complications. It must be remembered though that the player who has related ilgament weakness can not be insured a knee as stable but can be given added function if he puts forth an earnest effort in the rehabilitation processes.

Re-injury potential following post menisectomy is certainly a major concern to the coach and trainer in returning the athlete to competitive athletics. It is up to them to see that adequae follow up treatment and rehabilitation procedures are administered to guarantee maximum protection as well as participation.

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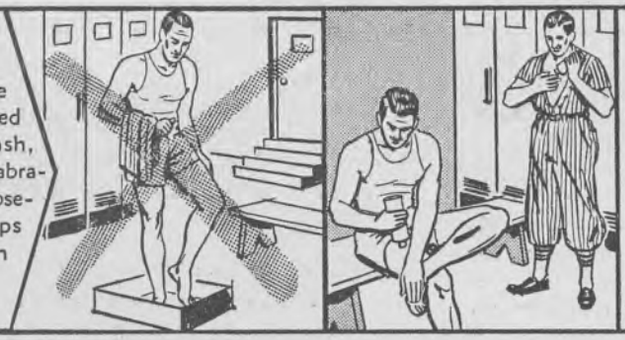

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