REPORT FROM THE MEDICAL PRACTICE

Treatment of Achilles Tendinopathy in the Athlete

by Steven I. Subotnick, D.P.M., M.S.

Over the past 17 years 422 cases of athletes with Achilles problems have been documented in the author's practice. The majority were treated conservatively, usually with physical therapy, strengthening and flexibility exercises, orthoses, or oral anti-inflammatory medications. A small percentage (21%) were treated surgically.

Prior to 1986, sixteen percent of the patients who were initially treated conservatively had been injected with steroid in the paratenon, given ultrasound, and had their activity reduced. Two of these patients sustained complete ruptures when they returned to full activity, despite a rest period. One of the ruptures occurred following 3 weeks of cast immobilization subsequent to the injection. Because of these incidents, injections around or into the tendo Achilles are no longer considered appropriate treatment in the author's clinic. On the other hand, 6-day decreasing doses of oral steroids, with or without the combined use of nonsteroidal anti-inflammatory agents, have been helpful and have not been associated with partial or complete ruptures of the tendo Achilles, but have been associated with other side affects such as flushing, euphoria followed by depression, fluid retention, and feelings of uneasiness. Furthermore, there is a growing public, as well as professional, concern about the utilization of corticosteroids unless absolutely necessary.

Pagliano and Jackson, in a 6-year study of injuries in over 3,000 long-distance runners and joggers, reported that 147 of these athletes presented with Achilles tendinitis (personal communication, JW Pagliano and DW Jackson, 1984). Krissoff also studied runners' injuries and reported that 18% presented with Achilles tendinopathy (personal communication, WD Krissoff, 1984).

Volk (1) described 42 cases of tenosynovitis of the Achilles tendon in military recruits unaccustomed to hiking or jogging. He noted that there was crepitation at the myotendinous junction in these patients, and he called this condition peritendinitis crepitans. I also noted that the myotendinous junction alone was involved, and most of the recruits returned to normal activity within 7 days folowing rest. The author has found that the utilization of viscoelastic heel inserts considerably helps this problem in as much as they reduce vibratory shock which occurs during heel impact. This shock has been found to be absorbed in the tendo Achilles and calf muscle itself.

Lapidus and Seidenstein (2) described three types of tendo Achilles problems. The first was the peritendinitis crepitans described by Volk, the second was a stenosing tenosynovitis of the synovial sheath, and the third was chronic tenosynovitis with effusion. Lapidus and Seidenstein noted that the third condition can follow rheumatoid arthritis, tuberculosis, and nonspecific effusion secondary to trauma. They described the nonspecific problem as one that responded to surgical decompression.

Peacock and Van Winkle (3) noted that the tendo Achilles is surrounded by loose areolar tissue that is similar to a tendon sheath, but moves with the movement of the tendon. The formation of the paratenon is directly related to the adjacent fatty tissue layer. The fibroblasts of the adult tendon are inactive; therefore, healing the tendon or the paratenon is dependent upon metaplasia of surrounding fat cells. This is an important consideration in the surgical repair of the paratenon or tendon.

Denstad and Roaas, (4) Subotnick (5, 6, 7, 8) and Perugia and Puddu (unpublished data, 1973) have all commented on surgical paratenon stripping and repair of the tendo Achilles in athletes. These authors advise excision of hypertrophic paratenon following trauma. Tight paratenon is released with a paratenon stripping. Intratendinous damage, such as partial rupture of central necrosis, is treated by appropriate excision of necrotic tissue and repair of torn tissue. Subotnick has described surgical decompression of the paratenon and loose sheath of the tendo Achilles for chronic recurrent Achilles tenosynovitis. (14), (15)

ACHILLES TENDINOPATHY

Achilles tendinopathy is one of the more common and most devastating injuries an athlete can have. Achilles tendinitis may be secondary to chronic repetitive stress or to a single incident. Chronic rubbing of the tendo Achillis by a tight, ill-fitting sports boot or shoe can cause chronic, irreversible hypertrophic changes to the paratenon, with subsequent pain and stiffness prior to, during, and following athletic activity. Acute strains can cause tearing of the paratenon and tendon, with subsequent adhesions between the paratenon and tendon resulting in chronic crepitation and pain.

Overuse, with chronic repetitive stress, can cause eventual inflammation and thickening of the previously loose paratenon. The paratenon has an abundant blood supply,

while the tendo Achillis has a poor blood supply. This abundant blood supply brings inflammation with chronic abuse. Eventually, fibrosis of tissue takes place, and adhesions occur between the paratenon and the tendon itself. The calf muscles make up four fifths of the bulk of the leg and absorb a considerable amount of stress during sports. Remember that muscles both produce and absorb energy. Much of this energy is absorbed by the tendo Achilles; thus, overuse and excessive loads can lead to chronic fibrosis and irreversible damage.

The two major forms of Achilles tendinitis are peritendinitis and tendinosis. Peritendinitis refers to inflammation or pathology of the paratenon or sheath of the Achilles tendon. Tendinosis refers to pathology within the tendon itself. (9) Tendinosis is usually asymptomatic, whereas peritendinitis is symptomatic. Because it is asymptomatic, tendinosis may eventually lead to a complete or partial rupture. It is likewise possible to have symptomatic peritendinitis with coexistent asymptomatic tendinosis. Pure symptomatic peritendinitis or paratenon inflammation and tightness may exist. Sometimes it is difficult to clinically distinguish between the conditions.

Peritendinitis or paratenon inflammation is usually associated with a boggy swelling of the sheath. Crepitation may be present. Tendinosis is usually associated with a more effusive form of swelling of the tendon and less superficial swelling. A patient with discomfort and swelling associated with peritendinitis or paratenon inflammation will initially respond dramatically to various forms of physical therapy, rest, and oral anti-inflammatory medications. Tendinosis, when symptomatic, is less responsive, usually having persistent pain and symptoms following physical therapy and biochemical treatment.

Peritendinitis or paratenon inflammation and adhesions, if treated early, may respond to physical therapy and a conservative approach. The longer one waits for treatment, especially when accompanied by chronic abuse despite pain, the greater the probability of irreversible symptomatology that will need surgical intervention. As a general rule, surgical correction is needed for chronic paratenon pathology that has not responded to a year of physical therapy or rest. The author has, however, seen cases of chronic peritendinitis, present for up to 2 years, that have responded to physical therapy, a change in biomechanics, and redistribution of weight load with the use of orthoses. The final solution for tendinosis is surgical intervention. The necessity for surgery depends upon the severity of the tendinosis and the accompanying symptomatology.

Achilles tendinopathy may be associated with (with insertional calcification) retrocalcaneal exostosis, increased posterior angulation of the calcaneus, retrocalcaneal bursitis, or systemic disease, such as rheumatoid arthritis, gonorrhea, gout, ankylosing spondylitis, or Reiter's syndrome.

BIOMECHANICS

Achilles tendinopathy may also be associated with post traumatic anterior impingement exostosis of the ankle joint, which limits dorsiflexion. Such conditions as hallux limitus or hallux rigidus may place additional stress on the posterior musculature of the leg. Excessive calcaneal valgus places asymmetric force on the medial side of the tendo Achilles. The cavus foot absorbs shock poorly and tends to place more stress on the lateral side of the tendo Achilles. Rearfoot varus and forefoot varus tend to cause rapid contact and midstance pronation with secondary torque and strain to the medial aspect of the tendo Achilles. (10, 11, 12, 14).

Dynamic imbalance with weak anterior muscles and relatively strong, overdeveloped posterior muscles may lead to Achilles tendinopathy. It is important, therefore, to strengthen the anterior musculature and stretch the posterior musculature.

USE OF ORTHOSES WITH ACHILLES TENDINOPATHY

Orthoses may be helpful in treating patients with Achilles tendinopathy. The functional varus of running, tibial varum, or rearfoot varus is controlled by an orthosis with a medial post. This decreases the speed of pronation, which helps protect the Achilles tendon and paratenon. Full-length orthoses with overcorrection of the forefoot limit propulsive pronation and secondary torque and countertorque of the rearfoot and the Achilles tendon. Orthoses with lateral posting encourage motion in the cavus foot. One quarter inch heel lifts decrease the strain on the posterior musculature. Viscolas or PPT heel pads decrease impact shock. It is the author's preference to use soft temporary supports for a trial period before prescribing full-length semi-rigid orthosis. The stable lever system afforded by orthotic control appears to aid in balanced muscle function and development in the runner, and aid those with tendo Achilles pathology. (12, 14)

CONSERVATIVE TREATMENT

Conservative treatment consists of reduced activity for 3 to 6 weeks. Physical therapy consists of various modalities including ice massage and transverse friction, Dynawave, Acuscope, or electrogalvanic stimulation combined with ultrasound. (14) Topical homeopathic preparations including Arnica, Traumeel, and Rhus tox may be used for phonophoresis to enhance the effects of ultrasound. These topical homeopathic preparations have also been found useful in electrophoresis with direct current. Dynamic balancing exercises are prescribed. The patient is given a Flex Wedge or rubber tubing to work on strengthening and stretching the various muscles of the lower extremity. Substitute aerobic exercises, including biking and swimming, are encouraged. Oral nonsteroid anti-inflammatory medications may be used if there is considerable inflammation. The author, however, over the past four years has found it valuable to utilize oral homeopathic preparations which are specifically matched to the uniqueness of the presenting complaint of the patient with Achilles tendinopathy. This preference follows 15 years of clinically successful administration of oral steroidal medications in the author's practice.

If a partial rupture is suspected, then a posterior fiberglass cast is used for 4 to 6 weeks. An MRI is a useful diagnostic test

to differentiate between fibrous adhesions, adhesive tendinopathy, and partial ruptures or internal derangement of the tendon itself (tenindosis). Ultrasound imaging is also helpful to make this diagnosis. Additional diagnostic tests include a Xerogram or CAT scan, if one suspects *bone pathology* (insertional calcification with tendinitis) at the attachment of the tendo Achilles to the calcaneus. (15) When crepitation is present, or there is considerable pain non-responsive to the above conservative treatment plan, injection therapy is carried out utilizing homeopathic biological preparations.

Once the pain and inflammation are stabilized with conservative treatment, gait analysis and treadmill analysis of walking and running are performed. In difficult cases, the Electrodynogram is used to evaluate the gait pattern. Temporary orthoses are prescribed with appropriate rearfoot, midfoot, and forefoot control. If temporary devices are helpful, permanent devices are prescribed. The patient is then put on a gradually increasing activity program to accomplish strength balance flexibility and endurance. The majority of patients have responded favorably to this conservative approach.

THE UTILIZATION OF HOMEOPATHIC PREPARATIONS IN TREATING ACHILLES TENDINOPATHY

TOPICAL PREPARATIONS

Topical homeopathic preparations are useful for simple direct application, direct application with occlusive dressings, or in combination with physical therapy including massage, ultrasound, or direct current. Traumeel (R) is a homeopathic combination preparation in a hydrophilic ointment base. It includes Arnica, Calendula, Symphytum, Bellis, as well as other ingredients known to be effective for the temporary relief of pain, discomfort, and inflammation from strains, sprains, and bruises. The author has found success utilizing Arnica montana topically for overuse, myositis, tendinitis, and post traumatic inflammation. Topical Rhus tox is useful for those conditions which are very stiff after periods of rest, worse with initial motion, and considerably improved with continual motion.

ORAL HOMEOPATHIC MEDICINE

Various oral homeopathic preparations can be used depending upon the objective and subjective findings present with Achilles injury or tendinopathy. Acute injuries usually require Arnica, which is useful until the acute inflammatory phase has passed. For acute trauma, Arnica 200c or 1M potencies are utilized every one to two hours until symptomatology decreases. If there is pain out of proportion to the injury, or if an an injured part is very sensitive to cold or touch, Bellis is used instead of Arnica. If neither Arnica nor Bellis offers relief, and there is still considerable pain swelling and inflammation, homeopathic Sulphuric acid in a 200c or 1M potency may be helpful. If the area is extremely stiff yet better with cold application, Radium bromide may be useful. If the area is very sore and worse with motion yet better with cold, Bryonia may be helpful. If there is considerable pain at the attachment of the Achilles tendon to the bone which is better with elevation above the heart, and Rhus tox, as well as Bryonia, has failed, then Phytolacca may offer relief. If considerable periostitis is present and there is pain about the attachment of the Achilles tendon to the calcaneus, associated with bursitis, Ruta grav is most helpful. With Ruta grav there is usually stiffness and discomfort with rest, improvement with continued motion, yet pain and discomfort with sustained activity. Patients in need of Ruta are usually very irritable or depressed over their injuries. If large spurs exist at the back of the calcaneus and are involved in the pathological process at the attachment of the tendo Achilles, Hekla lava may be helpful. If one cannot decide whether the patient is better or worse with motion, in other words if it's not exactly Rhus tox or Bryonia, results may be obtained utilizing Stellaria. If the part is very cold, yet better with cold applications, Ledum is the medication of choice. If the Achilles tendinitis is associated with a migratory form of soft tissue or arthritis, or if the pain is wandering from part to part of the Achilles tendon, Pulsatilla may be the treatment of choice. When Pulsatilla is indicated there is usually migratory type pain and the part is better with cool. The patient is generally improved with a cool breeze and wishes to have the windows open at all times. Pulsatilla is most often indicated in women of a mild temperament. Pulsatilla patients characteristically are not very thirsty. In comparison, a Rhus tox patient may be thirsty for cold milk, and is almost always much better with heat.

Depending upon the acuity of the case, the physician adjusts the potency and dosage of the homeopathic medicines. For an acutely traumatic area a high potency such as 1M or 200C is used for two to three doses. Following resolution of the acute phase, usually in 48 hours, a low potency such as 30C may be used 2-3 times a day for five or six days, or until the subacute process has resolved. Once a chronic phase is reached, the usual problem is that of stiffness in the Achilles tendon and pain upon continued or excessive use. For those problems I find Rhus tox, or Ruta are most commonly used. Following resolution of the Achilles problem, and prior to return to activity, a homeopathic Calcium preparation is usually necessary. Calc phos 1M, single dose, is helpful for a taller, light skinned patient who is thirsty and recovering from an Achilles strain. This is especially helpful for adolescents going through a growth spurt. Calc carb is useful for the stockier, typically blue-eyed patient, who tends to sweat on the face and upper extremity with activity. These patients also may sweat on the feet and have smelly sweat. They typically like dairy products and, especially, eggs. Calc fluor is useful for retrocalcaneal bursitis and exostosis associated with Achilles insertional tendinopathy. Calc sil is useful for a refined quiet person who tends to be chilly. Calc ars is used for a somewhat anxious patient, who is fastidious, well dressed, and on the chilly side.

Following a single dose of one of the calcaneal preparations, if low grade stiffness or soreness still persists, then low potency homeopathic medication may be used twice a day for one or two weeks. The author has found 12C Rhus, Ruta, or any of the calcarea preparations to be helpful. This is especially so if the patients being treated are also on allopathic medications

which may weaken or antidote the homeopathic medicines.

INJECTABLE HOMEOPATHIC MEDICINES

Injectable homeopathic biological preparations are available from BHI in sterile ampules. Traumeel is useful for the initial post traumatic treatment of the the tendinitis; 1 cc of Traumeel is mixed with 2 cc's of 2% Xylocaine plain and one half cc of Wydase. This mixture is percussed 20 times and then with the use of a 30 gauge needle, injected between the sheath and the tendon to accomplish a fluid Adhesiotomy in the area of Adhesive tendinopathy. When stiffness is present, following the acute phase, Rhus tox is injected, in the same proportion as that of Traumeel. If there's considerable swelling or lymphatic congestion, Lymphomyosot is used. When Retrocalcaneal bursitis is present, Ruta grav is injected. If there are large adhesions or areas of Fibrosis, Graphites or Silicea is injected. The author has found that Graphites and Silicea also are helpful in disolving fibromas in the plantar fascia.

Injections are carried out once a week for 3 to 4 injections or until resolution of symptomatology. The author has found that usually 3 injections are necessary to completely resolve the problem. Following injections, activity is reduced since the patient will generally feel improved, yet healing has not completely taken place. Excessive activity during this phase could result in increased injury.

ACHILLES PATHOLOGY WITH CHRONIC DISEASE

When chronic disease is present a constitutional homeopathic workup is necessary. This is carried out by a skilled homeopath with considerable training in classical homeopathy. The author has also found success using BHI combination oral products for those patients, too difficult to treat with classical homeopathy due to suppression with allopathic drugs, or a very complicted past medical history with a low vital force (poor immune system). Thus, BHI Arthritis is good as a general arthritic medicine which can be used as one would otherwise use non-steroidal anti-inflammatory medication such as Motrin, Naprosyn, or Feldene. One tablet 3 times a day is the normal dose and has helped several patients reduce their arthritic symptoms. This is especially true of older patients who are taking many various medications which otherwise may antidote classical homeopathic treatment. Along these lines, BHI Bone has been helpful when spurs or bony pathology are present. For edema, BHI Lymphatic in tablet form is most useful. As previously mentioned, Traumeel is helpful for acute trauma of any type and may be taken orally as a tablet or a sublingual liquid.

SURGICAL APPROACH

For those patients non-responsive to conservative treatment, surgery is the treatment of choice. Surgical procedures involve releasing tight achilles paratenons and removing pathological tendon sheaths. Abnormal tendon defects or partial ruptures are repaired surgically. Associated retrocalcaneal bursitis or exostosis are treated surgically. (15)

SUMMARY

A report of 422 cases of Achilles tendinopathy has been presented, of which 338 were previously presented by the author in 1986 in a paper, published in the journal of the American Podiatric Association. (13) This article is an update on the original article and includes utilization of homeopathic medicines topically, orally, and in injectable form. The author's experience using homeopathic medicines enhances the conservative treatment of Achilles tendinopathy and may reduce the necessity of surgery. If surgery is carried out, homeopathic medicine improves the results when used immediately pre-op, post-op, and in the chronic postoptic course.

For more information, contact the author, Steven I. Subotnick, D.P.M., M.S., at his clinical practice: 19682 Hesperian Boulevard; Hayward, California 94541.

The academic affiliations of Dr. Subotnick include: Past Clinical Professor of Biomechanics in Surgery, California College of Podriatic Medicine; Professor of Kinesiology, California State College at Hayward; Past - President of American Academy of Podiatric Sports Medicine; Fellow, American College of Sports Medicine; Trained in Classical Homeopathy at the Hahnemann College of Homeopathy in Berkeley, California.

REFERENCES

1. Volk FM: Traumatic tenosynovitis in training camps. Milit Surg 94: 293, 1944.
2. Lapidus, P.W. and Seiderstein, H.: Chronic non-specific tenosynovitis with fusion about the ankle. J Bone Joint Surg 32A: 157, 1950.
3. Peacock, E.E. and Van Winkle, W.: Surgery and biology of wound repair. WB Saunders Co., Philadelphia, 1970.
4. Denstand, T.F. and Roaas, A.: Surgical treatment of partial Achilles tendon rupture. Am J Sports Med 7:15, 1979.
5. Subotnick, S.I.: Surgical treatment of Achilles tendon tenosynovitis (paratenonitis) in runners. JAPA 67: 280, 1977.
6. Subotnick, S.I.: Achilles tendon injury in sports: A comprehensive report, Futura Publishing Co, Mt. Kisco, NY, 1980.
7. Subotnick, S.I.: Achilles tendinitis: Medical notes for runners. California Track and Running News, 92: 14, 1984.
8. Subotnick, S.I.: Podiatric sports medicine, Futura Publishing Co. Mount Kisco, NY, 1975
9. Williams P. and Warwick R., eds: Gray's Anatomy, 36th Ed., WB Saunders Co., Philadelphia, 1980.
10. Subotnick, S.I.: Variations in the angle of gait in running. Phys Sports Med 7: 110, 1979.
11. Subotnick, S.I.: Biomechanics of running. Med Sport 12: 169, 1978
12. Subotnick, S.I.: Orthotic foot control and the overuse syndrome. Phys Sports Med 3: 75, 1975.
13. Subotnick, S.I. and Sisney, P.: Treatment of Achilles tendenopathy in the athlete. J.A.P.A. 67: 552-557, 1986.
14. Subotnick, S.I.: *Sports Medicine of the Lower Extremity*, Churchill Livingston, New York, NY, 1989.
15. Subotnick, S.I. and Block A.P.J.: Retrocalcaneal problems. Clinics of Podiatric Medicine and Surgery. Vol 7, No. 2: 323-332. April 1990.