Continuing Medical Education

Anterior Ankle Impingement Syndrome

Here's an update on the diagnosis and treatment of this disorder.

BY KYLE SCHOLNICK, DPM

Goals and Objectives

After completing this CME, the reader will:

1) Understand how to identify anterior ankle impingement

2) Learn how to diagnose specific pathologies causing impingement

3) Understand which imaging studies are best to diagnose each pathology

4) Learn how to properly treat each pathology causing impingement

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*Following this article, an answer sheet and full set of instructions are provided (pg. 144).—**Editor***

Anterior ankle impingement syndromes are pathological conditions involving painful restriction of motion at the tibiotalar joint due to entrapment of hypertrophic soft tissue, torn ligaments, or osteophytes in the anteromedial, anterior, or anterolateral ankle.

Anterior Ankle Impingement

Anterior impingement of the ankle most commonly is caused by osteophyte formation at the anterior rim of the tibia and talar neck (Figure 1). Anterior tibiotalar osteophytes are caused by recurrent microtrauma to the joint capsule and anterior chondral margin of the tibiotalar joint, such as from kicking a soccer ball or forcible dorsiflexion.[1] Repeated trauma causes microfrac-

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tures of trabecular bone, subperiosteal hemorrhages, and subsequent calcification and bone growth from the anterior talus, fibula, or tibia.[2] Osteophytes can increase in size or break off into the joint and form a loose body. With repetitive dorsiflexion, the anterior joint capsule and calcification becomes impinged between osteophytes causing soft tissue inflammation and pain.[3]

Anteromedial Ankle Impingement

Anteromedial ankle impingement typically occurs from injury to the deltoid ligament complex from blunt trauma or an eversion sprain leading to scar formation, synovitis, or hypertrophic bone changes along the anteromedial joint line (Figure 2).[4] The anterior tibiotalar ligament is most commonly involved, but tearing and entrapment of the anteromedial joint capsule is also possible.[5] Following recurrent eversion ankle injuries, the anterior fibers of the deltoid thicken, which may become caught between the medial malleolus and talus during dorsiflexion.[6] It is also common that an avulsive injury at the insertion of the anterior tibiotalar ligament or dystrophic ossification following prior ligamentous injury may cause anteromedial joint pain. Patients will present with limited ankle dorsiflexion and supination, with focal anteromedial tenderness and swelling, exacerbated by ankle dorsiflexion.

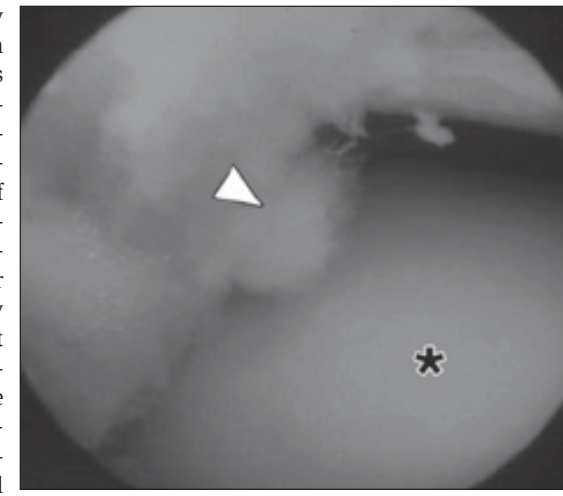

Figure 3: Arthroscopic view showing scar tissue and synovitis (white arrowhead) between talus (asterisk) and fibula

Ankle inversion sprains are another common cause of anteromedial ankle impingement.

Ankle inversion sprains are another common cause of anteromedial ankle impingement.[5] Repetitive impaction between the medial malleolus and the medial facet of the talus may result in an osteochondral lesion, spur formation, inflammation, proliferation of the synovium, and scar tissue.[7] In addition to arthroscopic debridement, lateral ankle ligament reconstruction may be indicated. Finally, a cavus foot may induce pressure on the anteromedial facet of the ankle joint, resulting in osteophyte formation.[8]

Anterolateral Ankle Impingement

Anterolateral soft tissue impingement occurs in 3% of all ankle sprains.[10] There are numerous types of soft tissue pathologies that may cause anterolateral ankle impingement. Most commonly, these lesions occur as a surgical complication or from poor management of an inversion ankle sprain, which damaged the anterior talofibular ligament (ATFL) or calcaneofibular ligament (CFL). These lesions include arthrofibrosis, localized synovial hypertrophy, meniscoid lesions, and impingement of the distal fascicle of the anterior inferior tibiofibular ligament (AITFL).

Arthrofibrosis is capsular scar tissue caused by an influx of inflammatory cells and the initiation of the clotting cascade within the damaged tissue. Subsequent fibroblastic proliferation ensues with excessive collagen synthesis leading to fibrosis.

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Figure 1: Lateral radiograph of ankle showing osteophytes at the dorsal aspect of the talar neck and anterior lip of the distal tibia

Figure 2: MRI coronal fat-suppressed proton density-weighted image showing thickening and ossification of deep (white arrows) and superficial (black arrowhead) deltoid ligament fibers

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Synovitis following an ankle sprain is caused by an influx of inflammation to the damaged lateral ankle ligaments, leading to progressive synovium enlargement (Figure 3). Hematoma may also occur from a capsular tear, leading to hemorrhagic synovitis. Synovitis becomes exacerbated once the hematoma is resorbed by the synovium. Synovial shelf lesions may also form, which are fibrous bands attached at two ends and extend over the anterior joint line. Early resection of impinging synovium will inhibit the cascade to chronic synovitis and scar tissue formation.[9]

Meniscoid lesions get their name from the resemblance to a torn meniscus in the knee. These lesions are hyalinized connective tissue arising from remnant fibrotic scar tissue of the ATFL and CFL. The forced plantarflexion and supination of an ankle sprain results in hemorrhage, fibrinous debris in the lateral gutter, soft tissue scarring at the anterolateral aspect of the talus, and post-traumatic synovitis.[10] In the weeks to months following the initial injury, the synovitis may impinge on the anterolateral talar dome, causing pain and restriction of dorsiflexion. Over time, the synovitis will coalesce to undergo hyalinized fibrosis. The hyalinized fibrotic tissue may become meniscoid in shape and result in impingement during ankle dorsiflexion along the anterolateral talar dome (Figure 4). Repetitive abrasion may result in a chondral lesion of the anterolateral talar dome.

The final cause of anterolateral soft tissue impingement is entrapment of Bassett's ligament, a thickened distal fascicle of the AITFL. The distal fascicle is found inferior and parallel to the AITFL and runs in intimate contact with the anterolateral corner of the talus (Figure 5). Pain occurs when this distal fascicle contacts the lateral talar dome during ankle dorsiflexion. Contact may occur from an abnormal distal insertion of the fascicle, increased length or width, or from a lax and damaged ATFL causing abnormal anterior extrusion of the talus.[11]

The final cause of anterolateral soft tissue impingement is entrapment of Bassett's ligament, a thickened distal fascicle of the AITFL.

Abnormal talar extrusion will cause repetitive friction between the talus and the fascicle, particularly during ankle dorsiflexion.[12] Abrasion of the anterolateral talar dome articular surface may develop as a result of this friction. Syndesmotic ligament injuries may also lead to hypertrophic scar tissue and synovitis at the inferior margin of the AITFL, possibly forming a meniscoid lesion and lead to impingement.

Bassett's ligament is significantly thicker in abnormal cases, but sensitivity and specificity of magnetic resonance imaging (MRI) using the thickness of the ligament as a sign of abnormality, has been inconsistent and unreliable (Figure 6).[13] Therefore, arthroscopy remains the best tool for this diagnosis. Indications for resection of Bassett's ligament are contact between the AITFL and the talus in the beginning of plantarflexion of the ankle, increased contact between Bassett's ligament and the talus throughout ankle range of motion, or if Bassett's ligament inserts into the distal fibula.[11]

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Studies have shown good to excellent results after arthroscopic resection of the impinging Bassett's ligament. These cases have resulted in unobstructed ankle plantarflex-

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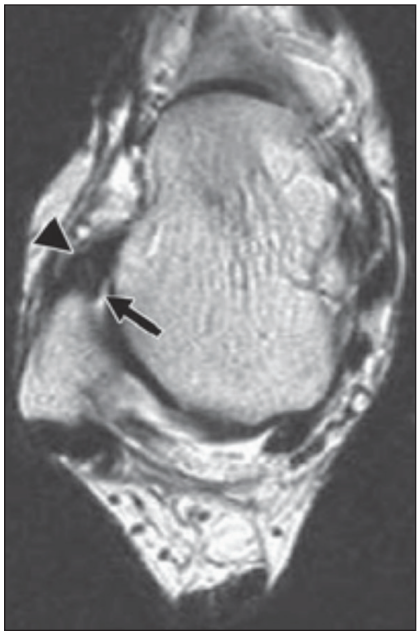

Figure 4: Axial T1-weighted MRI image showing low-signal intensity meniscoid lesion extending from thickened anterior talofibular ligament (ATFL) into the lateral gutter

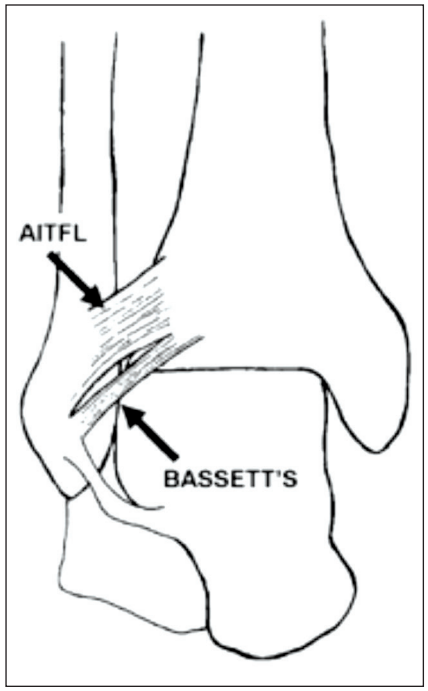

Figure 5: Bassett's ligament in relation to the anterior-inferior tibiofibular ligament (AITFL)

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ion and dorsiflexion in 89-100% of cases at an average follow-up of three years.[14] A useful pearl during arthroscopic resection of Bassett's ligament is not to use distraction of the ankle. Distraction relieves contact and impingement of the fascicle on the talus and may cause the surgeon to miss a pathological distal fascicle.[14]

Diagnosis

Patients will describe persistent pain and swelling in the anterior ankle, with limited dorsiflexion, which persists for many months. Pain is exacerbated by dorsiflexion, and clinical exam may reveal soft tissue swelling over the anterior ankle joint. Movement limitation may sometimes be overcome by excessive ankle pronation. A history of a recent traumatic event, such as an ankle sprain, is common. During maximum plantarflexion, osteophytes may be palpable just medial to the tibialis anterior tendon or along the anterior rim of the tibia. Liu, et al. described six clinical guidelines for diagnosing anterolateral ankle impingement, which demonstrated 94% sensitivity and 75% specificity.[15]

These guidelines included ankle joint tenderness, ankle joint effusion, pain with forced dorsiflexion and eversion, pain with a single-leg squat, pain with activity and absence of mechanical instability. One of the most accurate clinical tests to diagnose anterolateral ankle impingement is the impingement or Solan sign. This test is performed by applying thumb pressure over the lateral gutter of the ankle as the foot is moved from plantarflexion to dorsiflexion. If hypertrophic synovium is present, it will be forced into the joint by the examiner's thumb and elicit pain by impinging the synovium between the talar neck and distal tibia.[16] This test is reported to be 94.8% sensitive and 88% specific for synovial hypertrophy. Patients with impingement secondary to Bassett's ligament may describe a popping or catching sensation during ankle dorsiflexion and eversion.

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Radiographs should be performed to rule out tibial or talar osteophytes, fractures, widening of the ankle mortise, and arthritic changes. Stress radiographs can be used to rule out ligament laxity. MRI will be most useful for evaluating soft tissue impingement, synovitis, fibrosis, and capsular thickening, while ruling out osteochondral defects, marrow contusions, intra-articular loose bodies, peroneal tendinitis, syndesmosis abnormality, and sinus tarsi syndrome. T1-weighted imaging is optimal for detecting the low-signal synovial hypertrophy and scarring in the anterolateral or anteromedial ankle gutters.[15]

Since the synovial membrane is highly vascular, the increased vascularity from synovitis will be better appreciated if contrast is used. However, a mature meniscoid lesion will be avascular and will not be enhanced. A meniscoid lesion will appear as hypo-intense on both T1 and T2-weighted images.[17] Thickening and nodularity of the ATFL and lateral gutter fullness is suggestive of anterolateral impingement and is most reliably seen on T1-weighted axial imaging. Liu, et al. found that MRI had only 39% sensitivity and 50% specificity for an anterolateral impingement lesion.[15] Therefore, arthroscopy continues to be the gold standard of diagnosis.

Magnetic resonance arthrography (MRA) has been found to be accurate in 97% of anterolateral impingement cases and is used to identify ligament tears in the ankle.[18] A lack of normal joint distention in the anterolateral gutter is typically caused by scar tissue and synovitis, preventing fluid from entering the joint recess.[19]

Computed tomography (CT) scans can also be used to evaluate for osteophytes, osteochondral lesions, or arthritic changes. Ultrasound has been shown to correlate well with arthroscopic findings in its ability to detect soft tissue abnormalities, such as a synovial mass or capsular nodularity.[20] Single photon emission computed tomography with lose-dose CT (SPECT/CT) is helpful for better localization of lesions and can be used when MRI and ultrasound are equiv-

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Radiographs should be performed to rule out tibial or talar osteophytes, fractures, widening of the ankle mortise, and arthritic changes.

Figure 6: Coronal plane MRI image showing relationship of Bassett's ligament (black arrow) to the anterior-inferior tibiofibular ligament (AITFL) (white arrow)

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ocal, in patients with metal implants, and for claustrophobic patients.

Anterior ankle impingement must be differentiated from other sequelae of an ankle sprain, such as osteochondral lesions of the talus, degenerative joint changes, peroneal or extensor tendinitis, sinus tarsi syndrome, hematoma formation, stress fractures, and chronic ankle instability. Keep in mind that these abnormalities may co-exist with anterolateral impingement and may lead to persistent pain despite surgical resection of the tissues causing impingement.

Other differentials may include an impingement at a joint other than the ankle. Scar tissue may protrude into the syndesmotic recess, causing impingement symptoms that may mimic a soft tissue impingement lesion in the anterolateral gutter.[21] Talocalcaneal or calcaneofibular impingement is caused by decreased space between the lateral calcaneal wall and the talus or tip of the fibula, respectively. These impingements are a common consequence of a hindfoot valgus deformity resulting from posterior tibial tendon dysfunction, congenital flatfoot, or a malunion from a previous calcaneal fracture.[22]

Pain results from the abnormal bony contact of the lateral calcaneus and the talus or fibula and soft tissue impingement from fibrosis in the lateral gutter, entrapment of the sural nerve, and compression of the peroneal tendons. In these cases, a calcaneal osteotomy, subtalar joint arthrodesis or a subtalar joint bone-block distraction arthrodesis is often needed to correct the hindfoot valgus and relieve the lateral hindfoot impingement.

After a diagnosis is confirmed, conservative treatment is traditionally implemented for at least three to six months.

Treatment

After a diagnosis is confirmed, conservative treatment is traditionally implemented for at least three to six months.[23] Conservative treatment involves rest, ultrasound, electrical stimulation, range of motion exercises, strengthening and proprioceptive training, anti-inflammatory medication, orthotics, taping, ankle bracing, and intra-articular corticosteroid injections for diagnostic and therapeutic purposes. If symptoms continue after six months of conservative care, surgical arthroscopy may be undertaken to debride osseous spurs, scar tissue, entrapped ligaments, or hypertrophic synovitis.

The medial and lateral gutters should be excised of soft tissue until clear visualization of the sides of the talus and each malleolus are seen.

Arthroscopic debridement has been shown to have a shorter recovery period and faster return to function compared to arthrotomy.[24] However, open arthrotomy for removing anterior osteophytes of the ankle has been reported to produce good outcomes.[25] Arthroscopic debridement is performed by placing the patient in a supine position and injecting the ankle joint with 15-20 mL of local anesthetic or normal saline to distend the joint and ease entry. The anteromedial portal is created by placing a small stab incision just medial to the tibialis anterior tendon at the level of the ankle joint.

The stab incision is made through the dermis only and dissection to the joint capsule using a hemostat is performed. A cannula and blunt trocar are inserted through the capsule and into the ankle joint. The trocar is removed from the cannula, and the arthroscope is inserted to visualize the joint. The anterolateral portal is created just lateral to peroneus tertius at the level of the ankle.

The surgeon may use the light from the camera in the anteromedial portal to visualize the neurovascular structures over the anterolateral ankle in order to avoid damaging them. The same procedure is performed to get to the ankle joint as was done for the anteromedial portal. Once in the ankle joint, shavers, biters, curettes, burrs, and any other instruments needed for debridement of scar tissue can be inserted. Radiofrequency is also an option to coblate tissue and facilitate the removal of soft tissue. The arthroscope can then be switched to the anterolateral portal, and instruments used for debridement can be placed in the anteromedial portal. The ingress and egress of fluid aid in distending the joint space to maximize visibility.

The medial and lateral gutters should be excised of soft tissue until clear visualization of the sides of the talus and each malleolus are seen. At this point, intra-articular tibial and talar osteophytes can be resected back until normal cortical bone is seen. If an ankle implant is present, avoid excessive bone resection, which may destabilize the implant. Inspection for osteochondral lesions should be performed. Testing range of motion is required after resection to ensure osteophytes have been resected.

Once the portals are sutured closed and a dressing applied, patients may ambulate as tolerated in a CAM walker and begin ankle range of motion exercises as soon as possible; however, too much activity may lead to drainage from portal sites and increase risk of infection or a synovial cutaneous fistula. Physical therapy is typically begun around two weeks postoperatively and is recommended to continue for three months.[23] Other complications following arthroscopy are neurological damage to the superficial peroneal nerve, followed by the saphenous nerve and cartilage damage.[26]

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Contraindications to arthroscopy include infection, severe degenerative joint disease with reduced joint space that won't allow proper maneuvering of instruments, severe edema, and peripheral vascular disease which may cause wound healing complications.

The success of arthroscopic debridement for anterior ankle impingement is directly related to the staging of osteoarthritis in the ankle.

The success of arthroscopic debridement for anterior ankle impingement is directly related to the staging of osteoarthritis in the ankle. The absence of pre-operative degenerative changes within the ankle joint is a more consistent indicator of treatment success. Patients with associated ankle joint degenerative changes are significantly more likely to have poor long-term results following surgical treatment. Excellent results are obtained with arthroscopic debridement if patients have no osteoarthritis, but success rates fall to 77% and 53% for grade I and grade II osteoarthritis, respectively.[27]

Other studies showed 78-85% excellent to good results following arthroscopic treatment of anterior ankle impingement, but 96% of patients stated to have had some benefit from the surgery.[28] Ferkel, et al. showed good results after arthroscopic treatment of ankle impingement in 26 out of 31 patients.[29] Finally, a study by Murawski and Kennedy showed a 93% satisfaction rate following arthroscopic debridement of anteromedial ankle impingement in 43 patients.[30] **PM**

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SEE ANSWER SHEET ON PAGE 145.

1) What pre-operative condition will most likely lead to poor success following arthroscopic treatment of anterior ankle impingement?
- A) DISH syndrome
- B) Osteoarthritis
- C) Extensor tendinitis
- D) Rheumatoid arthritis

2) If performing arthroscopy with an ankle implant, what precaution should one follow?
- A) Excessive bone resection
- B) Excessive synovial tissue debridement
- C) Don't use a shaver
- D) Don't remove osteophytes

3) What has shown to have the best success rates for removing anterior osteophytes of the ankle?
- A) Arthroscopy
- B) Steroid injections
- C) Open arthrotomy
- D) Shockwave

4) Which condition will most likely lead to talocalcaneal impingement?
- A) Cavus foot
- B) Equinus
- C) Peroneal tendinitis
- D) Malunion from calcaneal fracture

5) What is the best study to detect synovial hypertrophy in the anteromedial ankle gutter?
- A) CT Scan
- B) T2 weighted MRI
- C) T1 weighted MRI
- D) PET Scan

6) How will a mature meniscoid lesion appear on MRI?
- A) Hyperintense on T1 and T2
- B) Hypointense on T1 and T2
- C) Hyperintense on T1 and Hypointense on T2
- D) Hypointense on T1 and Hyperintense on T2

7) Which of the following is NOT part of Liu's guidelines of diagnosing anterolateral ankle impingement?
- A) Single leg squat
- B) Double leg squat
- C) Absence of mechanical instability
- D) Solan Sign

8) How is the foot manipulated during Solan's Sign?
- A) Eversion to inversion
- B) Inversion to dorsiflexion
- C) Plantarflexion to dorsiflexion
- D) Dorsiflexion to eversion

9) What is the most common cause of anterior ankle impingement?
- A) Synovitis
- B) Meniscoid lesion
- C) Loose body
- D) Osteophyte

10) What is the most common ligament to be impinged in anteromedial ankle impingement?
- A) Anterior tibiotalar ligament
- B) Anterior talofibular ligament
- C) Anterior tibiofibular ligament
- D) Bassett's ligament

11) Bassett's ligament is part of what ligament?
- A) Deltoid
- B) Anterior inferior tibiofibular ligament
- C) Anterior talofibular ligament
- D) Calcaneofibular ligament

12) What % of ankles sprains lead to anterolateral soft tissue impingement?
- A) 3%
- B) 9%
- C) 15%
- D) 32%

13) What is the best way to inhibit the cascade to chronic synovitis and scar tissue?
- A) Injections
- B) Early resection of impinging synovium
- C) PT
- D) Immobilization

14) What will exacerbate impingement of Bassett's ligament?
- A) Cavus foot
- B) Flatfoot
- C) Compression of syndesmosis
- D) Talar extrusion

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Continuing Medical Education

CME EXAMINATION

15) What is the best way to diagnosis Bassett's ligament impingement?
- A) SPECT/CT
- B) MRI
- C) Clinical exam
- D) Arthroscopy

16) What should NOT be done during arthroscopic resection of Bassett's ligament?
- A) Distraction of the ankle
- B) Radioablation
- C) Tourniquet
- D) Knee flexion

17) Which of the following is NOT a contraindication to arthroscopy?
- A) Diabetes
- B) Osteoarthritis
- C) Severe edema
- D) PVD

18) What is the most common cause of osteophytes?
- A) Rheumatoid arthritis
- B) Trauma
- C) Flatfoot
- D) Cavus foot

19) How will movement limitation be overcome by patients with anterior ankle impingement?
- A) Supination
- B) Pronation
- C) Equinus
- D) Prolonged swing phase of gait

20) How is synovial tissue best imaged?
- A) MRI with contrast
- B) MRI without contrast
- C) CT scan
- D) SPECT/CT

SEE ANSWER SHEET ON PAGE 145.

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The* Podiatry Management Magazine *CME program is approved by the Council on Podiatric Education in all states where credits in instructional media are accepted. This article is approved for 1.5 Continuing Education Contact Hours (or 0.15 CEU's) for each examination successfully completed.

Home Study CME credits now accepted in Pennsylvania

Enrollment/Testing Information and Answer Sheet

Note: If you are mailing your answer sheet, you must complete all info. on the front and back of this page and mail with your credit card information to: ***Podiatry Management*, P.O. Box 490, East Islip, NY 11730.**

TESTING, GRADING AND PAYMENT INSTRUCTIONS

(1) Each participant achieving a passing grade of 70% or higher on any examination will receive an official computer form stating the number of CE credits earned. This form should be safeguarded and may be used as documentation of credits earned.

(2) Participants receiving a failing grade on any exam will be notified and permitted to take one re-examination at no extra cost.

(3) All answers should be recorded on the answer form below. For each question, decide which choice is the best answer, and circle the letter representing your choice.

(4) Complete all other information on the front and back of this page.

(5) Choose one out of the 3 options for testgrading: mail-in, fax, or phone. To select the type of service that best suits your needs, please read the following section, "Test Grading Options".

TEST GRADING OPTIONS

Mail-In Grading

To receive your CME certificate, complete all information and mail with your credit card information to:

Podiatry Management
P.O. Box 490, East Islip, NY 11730

PLEASE DO NOT SEND WITH SIGNATURE REQUIRED, AS THESE WILL NOT BE ACCEPTED.

There is **no charge** for the mail-in service if you have already enrolled in the annual exam CME program, and we receive this exam during your current enrollment period. If you are not enrolled, please send $26.00 per exam, or $210 to cover all 10 exams (thus saving $50 over the cost of 10 individual exam fees).

Facsimile Grading

To receive your CME certificate, complete all information and fax 24 hours a day to 1-631-563-1907. Your CME certificate will be dated and mailed within 48 hours. This service is available for $2.50 per exam if you are currently enrolled in the annual 10-exam CME program (and this exam falls within your enrollment period), and can be charged to your Visa, MasterCard, or American Express.

If you are *not* enrolled in the annual 10-exam CME program, the fee is $26 per exam.

Phone-In Grading

You may also complete your exam by using the toll-free service. Call 1-800-232-4422 from 10 a.m. to 5 p.m. EST, Monday through Friday. Your CME certificate will be dated the same day you call and mailed within 48 hours. There is a $2.50 charge for this service if you are currently enrolled in the annual 10-exam CME program (and this exam falls within your enrollment period), and this fee can be charged to your Visa, Mastercard, American Express, or Discover. If you are not currently enrolled, the fee is $26 per exam. When you call, please have ready:

1. Program number (Month and Year)
2. The answers to the test
3. Your social security number
4. Credit card information

In the event you require additional CME information, please contact PMS, Inc., at **1-631-563-1604**.

ENROLLMENT FORM & ANSWER SHEET

Please print clearly...Certificate will be issued from information below.

Name _____ Soc. Sec. #_____
Please Print: FIRST MI LAST

Address_____

City_____ State_____ Zip_____

Charge to: _____Visa _____ MasterCard _____ American Express

Card #_____Exp. Date_____

Note: Credit card is the only method of payment. Checks are no longer accepted.

Signature_____ Soc. Sec.#_____ Daytime Phone_____

State License(s)_____ Is this a new address? Yes_____ No_____

Check one:

_____ I am currently enrolled. (If faxing or phoning in your answer form please note that $2.50 will be charged to your credit card.)

_____ I am not enrolled. Enclosed is my credit card information. Please charge my credit card $26.00 for each exam submitted. (plus $2.50 for each exam if submitting by fax or phone).

_____ I am not enrolled and I wish to enroll for 10 courses at $210.00 (thus saving me $50 over the cost of 10 individual exam fees). I understand there will be an additional fee of $2.50 for any exam I wish to submit via fax or phone.

Over, please

ENROLLMENT FORM & ANSWER SHEET *(continued)*

EXAM #1/16
Anterior Ankle Impingement Syndrome (Scholnick)

Circle:

1.	A	B	C	D	11.	A	B	C	D
2.	A	B	C	D	12.	A	B	C	D
3.	A	B	C	D	13.	A	B	C	D
4.	A	B	C	D	14.	A	B	C	D
5.	A	B	C	D	15.	A	B	C	D
6.	A	B	C	D	16.	A	B	C	D
7.	A	B	C	D	17.	A	B	C	D
8.	A	B	C	D	18.	A	B	C	D
9.	A	B	C	D	19.	A	B	C	D
10.	A	B	C	D	20.	A	B	C	D

Medical Education Lesson Evaluation

Strongly agree [5]	Agree [4]	Neutral [3]	Disagree [2]	Strongly disagree [1]

1) This CME lesson was helpful to my practice ____

2) The educational objectives were accomplished ____

3) I will apply the knowledge I learned from this lesson ____

4) I will makes changes in my practice behavior based on this lesson ____

5) This lesson presented quality information with adequate current references ____

6) What overall grade would you assign this lesson?

A B C D

How long did it take you to complete this lesson?

_____hour _____minutes

What topics would you like to see in future CME lessons ?

Please list :

_____

_____

_____

_____

_____