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Editor's Message

Ronald Januchowski, DO, FACOFP, Editor, Osteopathic Family Physician


As the Editor-in-Chief of OFP I get to work with some incredible people to assemble this premier journal for our profession. From the Managing Editor to the Editorial committee members and contributing authors, all are dedicated to producing a great resource and reference for clinical practice.

I had the privilege last month to speak with a number of potential contributors to OFP at the Family Medicine Program Directors’ meeting. I presented to a group of medical educators working with what will hopefully be the next motivated set of primary care physician authors. A big thanks to Dr. Rob Danoff for allowing this to happen. I hope to see future submissions from this group and look forward to working to help this group of educators meet their scholarly activity requirements. As medical educators working with what will hopefully be the next motivated set of primary care physician authors. A big thanks to Dr. Rob Danoff for allowing this to happen. I hope to see future submissions from this group and look forward to working to help this group of educators meet their scholarly activity requirements. As OFP moves forward this year towards full Medline listing, I anticipate the quantity and quality of articles to far surpass previous years!

Besides providing primary care updates and reviews, one of the unique features of Osteopathic Family Physician is the inclusion of Osteopathic specific examination, treatment, or management options for our patients. I enjoyed reviewing Dr. Torres’ article in this issue on greater trochanteric pain syndrome. Imaging is nice, but having a good hands-on examination is critical for efficient and cost-effective care for our patients. More examination skills are highlighted in the article on snuffbox tenderness. Creating an atmosphere of mind-body-spirit is stressed in Dr. Riley’s article on a novel curriculum for Family Medicine residents. Another privilege of being Editor-in-Chief is seeing the submissions become part of the medical literature helping family medicine D.O.’s become better doctors. Being an excellent Osteopathic Family Physician means more than just doing OMT!

End of dad joke: "Pilgrims."

Have a wonderful next couple of months and we will see you in the summer!
FROM THE PRESIDENT’S DESK

Keeping Osteopathic Focus for the ACOFP Family
Robert C. DeLuca, DO, FACOFP dist.
2019 - 2020 ACOFP President

The 2019 ACOFP Annual Convention was the culmination of a great year for osteopathic family medicine. Through the leadership of Dr. Duane Koehler this past year, our profession has a very bright and exciting future. The ACOFP Board and I, as the 2019-2020 President, will continue with programs that will focus on “keeping osteopathic family medicine osteopathic.”

LEADERSHIP

Over the next year, we will look for new ways to engage members, better communicate, and improve perceptions of osteopathic training and certification.

Last year we conducted a communication audit to identify new ways to tell our story. The staff team remains committed to trying new things, including increasing our social media presence. We are making new connections, creating more videos and educational content, posting to LinkedIn, and have started an Instagram account that was quite popular at the convention.

Another way we’re looking to increase engagement is through our volunteer opportunities. To make for more meaningful volunteer experiences and successful results of each committee, the ACOFP Board reviewed and approved updated committee charges and goals for the coming year. We are taking a closer look at how each committee functions this year to determine if we are achieving our goals. If goals have not been reached, there may be other ways we can engage with members.

As one means to help increase member engagement, we formed a new committee.

• First, we have created a Knowledge, Learning & Assessment Advisory Committee. The goal of this group is to convene the chairs of committees that produce content, programs and services. There is an opportunity to better connect these groups to maximize efforts in a strategic way.

• A Residency Program Directors Committee was established to maintain and advance the process of osteopathically-focused graduate medical education and increase the number of programs that enhance in this process.

• The Family Medicine Chairs Committee was created to work with the US-based Colleges of Osteopathic Medicine Family Medicine/Primary Care departments to encourage osteopathic medical students to consider family medicine as a career, to encourage students to choose osteopathic recognized residency programs and to foster the osteopathic spirit and solidarity. Also, this group will help strengthen ties between COMs/Family Medicine Residency Programs with Osteopathic Recognition and the ACOFP by promoting the unique characteristics of Osteopathic Principles and Practices.

• Last, but not least, the Preceptorship Committee has been charged with identifying and educating high-quality preceptors to promote excellence and innovation with third and fourth-year osteopathic medical students to enhance their interest in osteopathic family medicine.

EDUCATION

ACOFP’s education goal is to be the leading source of osteopathic post graduate instruction in the country. At the Residency Directors workshop during ACOFP 15, there was a great surge of excitement when the AOBFP, AOA and the ACOFP jointly announced the initial phase of changes in the certification process. This culminated many years of work by these groups to streamline both initial and re-certification process.

We will continue our efforts to keep the dialog open with AOBFP and AOA to ensure that initial certification and OCC evolve in a way that maintains their high quality, osteopathic focus, but is flexible, more cost-effective and reflective of today’s learning style preferences.

We are excited about a new program for residents: Early Entry into OCC During Residency Training. A resident enrolled in an ACGME Family Medicine residency may be provisionally enrolled in OCC prior to completion of training by meeting certain requirements. Residents must complete two of three yearly AOBFP InService Exams during their residence, and pass the AOBFP Early Entry Initial Certification (EEIC) cognitive exam during year three of residency. Upon satisfying these requirements and verification of residency completion status, certification will be granted and the individual will be officially enrolled in OCC.

ADVOCACY

As part of our Federal & State Legislation Committee, the “Act Now” subcommittee is being formed to engage with new professionals and others interested in supporting Direct Primary Care legislation and resources. Also, they will work to support legislation in favor of physician-led health care teams opposing unsupervised practice of medicine by other health professionals.

ACOFP not only advocates for members with government agencies but also within the medical profession and affiliates. The ACOFP Congress of Delegates passed several important resolutions that will be forwarded to the AOA House of Delegates in support of cooperation between the ACOFP, AOBFP and the AOA regarding the continued focus on the osteopathic component of our education and evaluation programs.

As you can see, ACOFP has several new and exciting initiatives in the pipeline. This summer the Board will strategize a viable and visible pathway forward for our profession. Our goal is not only keep pace with change and support the osteopathic agenda but to proactively extend ourselves as the leaders for our specialty and the professional home for osteopathic family physicians.

Rocky Mountain OPTI/Sky Ridge Medical Center
Neuromusculoskeletal Medicine + 1 Residency

Our program was established to enable physicians who have already completed a residency in an approved specialty to spend an extra year enhancing their skills in neuromusculoskeletal medicine and osteopathic manipulative medicine (NMM/OMM). Our goal is to develop highly trained physicians who can act as both clinicians and academicians. Our program places a significant emphasis on the integration of osteopathic manipulative medicine and the principles of primary care sports medicine. Our residents develop their Osteopathic clinical skills by providing inpatient care at Sky Ridge Medical Center and outpatient care at the Rocky Vista Health Center and other associated outpatient clinics.

Our program also includes such rotation choices as neurological surgery, orthopedic spine surgery, podiatric medicine, primary care sports medicine, neurology, physical medicine and rehabilitation, rheumatology, musculoskeletal radiology, medical acupuncture, family medicine, integrative medicine, functional medicine, hospice and palliative care, internal medicine, obstetrics and gynecology and pediatrics. Academic development occurs through the Rocky Vista University College of Osteopathic Medicine in Parker, Colorado. Successful program completion will allow the physician to apply for the Neuromusculoskeletal Medicine/Osteopathic Manipulative Medicine certification examination.

Kenneth A. Ramey, DO, FACOFP serves as the program director and is a 1994 graduate of the Chicago College of Osteopathic Medicine. He is board certified in family medicine/osteopathic manipulative treatment, neuromusculoskeletal medicine/osteopathic manipulative medicine and has a certificate of added qualification in sports medicine. Dr. Ramey is a member of the medical staff at Sky Ridge Medical Center and has served as a team physician at the high school, college and semi-professional levels. He is an Associate Professor of OPP at Rocky Vista University and serves as the Director of the Sports Medicine and Osteopathic Manipulative Medicine Program at the Rocky Vista Health Center.

We have received ACGME Pre-Accreditation and would be honored to consider your application for our program. Please send a current CV, letter of interest and three letters of recommendation (including one from your residency director) to Dr. Ramey at kramey@rvu.edu. Please call Dr. Ramey at (720) 874-2421 if you need additional information.

“The purpose of Osteopathy is to make life a little more comfortable for the patient.”

“What are the limits of Osteopathy? No one knows the limits of Osteopathy.”

John Martin Littlejohn, DO
Reminder the PVCS is a Part of the Differential for Pelvic Pain

To the Editor:

The recent article “Chronic Abdominal Pain: Tips for the Primary Care Provider” (January/February 2019) provided an excellent overview of the topic. However, I want to remind my colleagues that Pelvic Venous Congestion Syndrome is also part of the differential for pelvic pain.

Pelvic Venous Congestion (PVCS) is the process of valve failure of veins or organs in the pelvis, similar to varicose veins in the legs. Those internal varicose veins can cause symptoms similar to those described in the article. Patients will often have visible varicose veins on their upper legs or, sometimes, the labia. The main symptom is pelvic pain that lasts for six months or more. Patients with PVCS report a prolonged deep and dull ache, often associated with movement, posture, and activities that increase abdominal pressure. Like varicose veins in the leg, the achiness that increases with prolonged standing can often be relieved by lying flat or elevating the legs.

PVCS usually affects women who have previously been pregnant, because the ovarian and pelvic veins widened during pregnancy to accommodate the increased blood flow from the uterus. After the pregnancy, some of these veins remain enlarged, causing them to weaken and allow blood to pool or flow in the wrong direction. Similar to varicose veins in the legs, venous congestion in the pelvis often first manifests during or after a pregnancy and worsens with subsequent pregnancies.

Risk factors for PVCS may include a family history of the condition, hormonal influence, pelvic surgery, multiple pregnancies, a retroverted uterus, and a history of varicose veins. African American women and women over 35 years of age have a lower risk of developing this condition.

After an initial exam, a number of non- or minimally-invasive diagnostic tests can be performed to determine whether chronic pelvic pain is a result of pelvic varicose veins. These tests include pelvic ultrasound, pelvic venography, Computed Tomography, and Magnetic Resonance Imaging. For patients with PVCS, interventional radiologists are a critical part of their care team.

There are a number of treatments for those diagnosed with pelvic venous congestion syndrome: medical, surgical, and minimally invasive. According to clinical practice guidelines by the Society for Vascular Surgery and the American Venous Forum, embolization of refluxing ovarian veins with coils, plugs, or sclerotherapy (usually in combination), has become the standard approach for management of PVCS.

With regard to the “Chronic Abdominal Pain” article, I suggest adding a vascular section to Table 2, which lists other possible systems. Additionally, Figure 1 does allude to vascular, though it only reflects arterial dysfunction.

Cindy Asbjornsen, DO, FACPh
Founder, Vein Healthcare Center
South Portland, Maine
www.veinhealthcare.com

Response

Dear Dr. Asbjornsen,

We appreciate your feedback to our manuscript, “Chronic Abdominal Pain: Tips for the Primary Care Provider.” The prevalence of PCVS is 15% in females aged 18 to 50 years in the United States and up to 43.4% worldwide. While this should be listed under pelvic pain, it is not high on the differential diagnosis for chronic abdominal pain. In addition, we have acknowledged your suggestion of adding a vascular section to Table 2.

Thank you for your feedback.

Kind regards,

Dr. Gina Charles
The Value of Snuffbox Tenderness: A Sign of Things to Come

Shawn Warner, DO, PGY-1; Eric Mast, DO; James Berry, MD; Dave Pocos, DO

1 Firelands Regional Medical Center, Sandusky, OH
2 Firelands Physician Group, Sandusky, OH
3 NOMS Access Orthopedics, Norwalk, OH

ABSTRACT: The scaphoid is the most commonly fractured bone within the carpals, accounting for up to 70% of all carpal fractures and frequently occurring as a result of an outstretched hand. Despite the high frequency of injury and a common mechanism of injury, it is common for a scaphoid fracture to go undiagnosed. In this setting, the patient is now at risk for numerous long-term complications. Using a case report of a 30-year-old male who had improper management of an acute scaphoid fracture, this article will review the proper management in the acute setting with advanced imaging and briefly discuss the long-term complications of an improperly treated fracture.

KEYWORDS: Avascular Necrosis, Malunion, Nonunion, Orthopedics, Scaphoid Fracture, Snuffbox Tenderness

HISTORY, PHYSICAL EXAM, AND DIAGNOSTIC ASSESSMENT

A 21-year-old male presented to the Emergency Department (ED) complaining of increasing left wrist pain at the base of the thumb. He states that he crashed his All-Terrain Vehicle (ATV) during a motocross race one day prior, subsequently landing on his stomach with his hands outstretched in front of him. The physical exam was positive for snuffbox tenderness while the wrist is in ulnar deviation. Plain film radiographs were taken of his left wrist (Figure 1). No fracture was reported, and he was discharged from the ED with a diagnosis of a left wrist sprain, immobilized in a splint and return in two weeks if the pain persisted. On follow up with PCP the patient's wrist pain was still present and at this time was placed in a short arm cast and instructed to follow up in four weeks. On return visit, he reported no improvement of symptoms and was subsequently referred to an orthopedic surgeon. At the initial visit with the surgeon, plain film radiographs of the left wrist were ordered and showed evidence of fracture of the left scaphoid (Figure 3).

At that point, he was then referred to a hand and wrist specialist for further management. After reviewing the case, it was decided to continue with nonoperative management and he was placed in a short arm cast with daily bone stimulator treatments. The patient continued to follow up with the hand specialist for repeat imaging every month to assess the status of the fracture. At month nine the fracture was labeled nonunion, and the surgeon recommended no further treatment and the patient was subsequently removed from the cast and told to return to activity as tolerated with no further follow up visits scheduled. Unfortunately, images from the hand and wrist specialist were not available.

INTRODUCTION

Carpal fractures comprise approximately 18% of all hand fractures.1 When considering fractures within the carpal bones, the scaphoid is the most commonly affected, accounting for 60-70% of all carpal fractures.1 Despite being the most commonly fractured carpal bone with a telltale mechanism of injury, a fracture of the scaphoid bone can be a difficult diagnosis to make. This is likely due to an array of nonspecific symptoms and a lack of evidence of a fracture on initial plain film radiographs.2 Due to the nature of the scaphoid structure, function, and its blood supply, there is an increased likelihood that trauma to the scaphoid can lead to long term complications. If a scaphoid fracture is suspected but the plain film radiographs are negative, it warrants further investigation in a timely manner.

ANATOMY

As depicted by its name, the scaphoid has a curved or “boat” shape to it. The scaphoid itself rests in a concave groove within the distal radius where it articulates with the radius and four carpal bones—the lunate, trapezium, trapezoid, and capitae3 (Figure 4). Due to its extensive articulation and small size, roughly 82% of the bone is covered in articular cartilage, leaving limited access for its arterial supply.4 Due to a study performed in 1980 by Gelberman et al, it has classically been taught that the primary blood supply for the scaphoid was supplied by the radial artery via a dorsal and volar branch, which enter through a bony foramina located at either the wrist or the distal aspect in 93% of people.5 This study showed that the two arteries that enter at the dorsal radius supplied 70-80% of the proximal scaphoid via intrasosseous retrograde flow and the distal 20-30% was supplied by branches surrounding the tubercle.6,7 However, more recently it has been shown using cadavers that the scaphoid blood supply is more extensive than previously thought.4,8 In some of the cadavers, the proximal, middle, and distal third of the scaphoid all may receive a direct blood supply. Although there is some anatomical variance described between the cadavers as far as the presence or absence and the size of the vessels, the surrounding arteries are able to compensate if one branch is completely missing.8

FIGURE 1: Plain film radiographs - left wrist

FIGURE 2: Technetium-99 Scan

FIGURE 3: Plain film radiographs - evidence fracture left scaphoid

FIGURE 4: Anatomy of the scaphoid

1 Warner, Mast, Berry, Pocos
2 The Value of Snuffbox Tenderness

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As previously mentioned, the floor of the snuffbox consists of the scaphoid, and pain with direct palpation is indicative of a scaphoid fracture and should be treated as such until proven otherwise. Snuffbox tenderness has a sensitivity of 86% and a specificity of 30%. Another physical exam test is known as scaphoid tubercle tenderness. This requires the examiner to locate the scaphoid tubercle on the volar aspect of the wrist and apply direct pressure. As the name implies, if there is tenderness with direct pressure, this is considered a positive test and points towards a scaphoid injury (Figure 7). Scaphoid tubercle tenderness has a sensitivity of 95% and a specificity of 74%. The Watson shift test is another physical exam maneuver designed to identify a scaphoid injury. The patient must sit with their elbow resting on the table and forearm pronated. With one hand, the examiner must slightly extend the wrist and then place it in ulnar deviation. With the other hand, the examiner must apply pressure to the volar aspect of the scaphoid with the thumb and place the fingers on the dorsal aspect of the wrist to provide counter pressure (Figure 8). The examiner should then radially deviate and slightly flex the patient’s wrist. If there is instability of the scaphoid due to a fracture or ligamentous disruption, the dorsal pole of the scaphoid will sublux or “shift” over the dorsal rim of the radius, reproducing pain. If there is only pain on this maneuver, it is indicative for a scaphoid fracture, but if the “shift” is felt, this may also point towards damage to the scapholunate ligament. The Watson shift test has a sensitivity of 43% and a specificity of 30%, which are relatively low, but the test can still be useful when the diagnosis is not clear.

None of these tests can definitively rule in or rule out a scaphoid fracture; instead, they offer information to help steer the clinical judgment of the examiner. It should be noted that in the acute setting of other wrist pathology, which explains the relatively high sensitivity but low specificity. If any of these tests are positive, the patient should be treated as if they have a fractured scaphoid until proven otherwise. This will help reduce the amount of missed scaphoid fractures and related injuries.

### Diagnostic Imaging

The typical radiographic workup for patients presenting with a scaphoid fracture includes a posteroanterior view with the wrist in neutral position, lateral view, oblique views with the wrist pronated 45 degrees, and a scaphoid view with the wrist in 45-degree ulnar deviation. However, plain film radiographs have a false negative rate of 20% for scaphoid fractures in the acute setting, and in this situation, it is common practice to place the patient in a thumb spica splint and repeat imaging two weeks later. However, it is unlikely that a repeat radiograph will show a fracture on a second review.

If there is a high suspicion of a scaphoid fracture with negative plain films, other modalities such as bone scintigraphy, computed tomography, or magnetic resonance imaging should be obtained.

It has been shown that MRI and CT have high sensitivities and specificities (MRI: 98% and 99% respectively; CT: 94% and 96%). When the provider is faced with the decision of ordering advanced imaging there are a few things to consider for each of the respective studies. An MRI is more sensitive and specific for scaphoid fractures, soft tissue injuries, and bone marrow edema which can be predictive of occult fractures. An MRI is also not associated with any ionizing radiation. However, an MRI of the wrist takes roughly 30 minutes and requires the patient to remain still for the duration of the exam. If the patient has difficulties remaining still secondary to pain or if they are claustrophobic, there may be increased image artifact, making it difficult to make a diagnosis. There may also be a contraindication to obtaining an MRI if the patient has a pacemaker or other implantable metallic constructs. There are also many benefits to obtaining a CT scan as it depicts the bony anatomy better than an MRI does, the duration of the study can be significantly less than an MRI, it is typically more readily available at institutions, and has a smaller financial burden to the patient. However, sensitivity and specificity are slightly inferior to an MRI, and a CT scan is associated with ionizing radiation. Although there is an increased initial cost of treatment with each of these studies, advanced imaging has been shown to be cost-effective in the acute setting by preventing unnecessary immobilization, fewer follow-up visits, fewer long-term complications, and decreased loss of overall productivity of the patient. The decision on which to study to order may vary on a case by case basis and depend on the availability of the resource.

### Complications

There are two variables that determine how well a scaphoid fracture heals: time allotted between injury and proper treatment, and whether the fracture is located in the proximal, middle, or distal portion of the scaphoid. Some of the complications associated with a scaphoid fracture include avascular necrosis (AVN), Dorsal Intercalated Segment Instability (DISI), delayed union, malunion, or nonunion.

AVN is a direct result of a disruption of blood supply to any bone, and in the setting of a scaphoid fracture, it usually affects the proximal segment. Avascular necrosis is typically more readily available at institutions, and has a smaller financial burden to the patient. However, sensitivity and specificity are slightly inferior to an MRI, and a CT scan is associated with ionizing radiation. Although there is an increased initial cost of treatment with each of these studies, advanced imaging has been shown to be cost-effective in the acute setting by preventing unnecessary immobilization, fewer follow-up visits, fewer long-term complications, and decreased loss of overall productivity of the patient.

The decision on which to study to order may vary on a case by case basis and depend on the availability of the resource. However, they are often
negative in the setting of pain for the first few months and the disease is fairly progressed when evident on plain film radiograph. MRI can detect AVN at an earlier stage, and it should be ordered if there is a high index of suspicion for AVN.

Malunion is defined by a fractured bone healing in an abnormal position, such as the two fragments being twisted, shortened, or bent relative to their anatomical position. If a patient suffers a scaphoid fracture and does not seek treatment, or the scaphoid bone is not reduced properly prior to casting, this can lead to a malunion. This will lead to abnormal joint structure and function, which will eventually progress to early arthritis and pain in the affected areas.

A common consequence of inadequate healing of a scaphoid fracture is nonunion. The official definition of nonunion is a failure of fracture healing at least nine months since the time of injury, and at least three months with no progression in healing. In the setting of a nonunion there is an increased risk of post-traumatic arthritis due to disruption of the proximal carpal joint function known as Scaphoid Nonunion Advanced Collapse (SNAC). If left untreated the arthritis of a SNAC wrist progresses in a rather predictable, step-wise fashion within the carpal.

The increased rate of complications, especially nonunion, may be due to a combination of the blood supply and also the relationship of the capitate articulation with the scaphoid. When stressed with load bearing, the capitate applies pressure directly to the scaphoid. This may allow more movement between the two pieces of bone with a proximal break when compared to a more distal fracture. When stressed with load bearing, the capitate applies pressure directly to the scaphoid. This may allow more movement between the two pieces of bone with a proximal break when compared to a more distal fracture.

The exact length of time between acute injury and development of long term complications can vary greatly from patient to patient. Due to the extended period of time between initial injury and development of complications, some patients can go years thinking there is no issue, only to develop chronic pain one day. This may severely impact their quality of life and can also lead to an increased financial burden on the patient.

The patient has just recently graduated from medical school and is completing the first year of his residency. Throughout school, his goal was to pursue a career in surgery. Now that he is aware of the potential for complications to develop, he has had to add this information into his decision on whether or not a surgical specialty is the best option for him, given the high possibility of one-day developing chronic wrist complications previously discussed.

Given the nature of this injury it is hard to say if this patient would have had a different outcome if he was treated properly in the acute setting, as a nonunion can still occur with proper management. However, it is common practice that sniffbox tenderness is a broken scaphoid until proven otherwise, cases like this one still slip through the cracks. It is these cases that we, as health care providers, must get better at preventing. If one is suspicious of a scaphoid fracture and plain film radiographs are inconclusive, there is a clear benefit to pursue advanced imaging for a more definitive answer.

AUTHOR DISCLOSURES: No relevant financial affiliations

REFERENCES:
1. deWit, Kevin A et al. Snuffbox Tenderness Osteopathic Family Physician. Volume 11, No. 3 | May/June, 2019
An Osteopathic Approach to Greater Trochanteric Pain Syndrome

Jonathan W. Torres, DO; Christopher Zipp, DO, FACOFP

1Atlantic Health System, Morristown, New Jersey

KEYWORDS:
Greater Trochanteric Pain Syndrome
Osteopathic Manipulative Medicine
Trochanteric Bursitis

ABSTRACT: Greater trochanteric pain syndrome is a common office complaint in primary care. It encompasses a constellation of clinical conditions, including greater trochanteric bursitis, teninopathies affecting the gluteus medius and minimus, inflammation of the iliotibial band and abductor-adductor imbalance. Common treatments include supportive care such as rest, ice, and compression as well as corticosteroid injections. Extracorporeal shockwave therapy and home exercise programs. Surgical interventions are reserved for refractory cases. Emerging therapies include OMM utilizing muscle energy, as well as regenerative medicine such as PRP or prolotherapy.

INTRODUCTION
Greater trochanteric pain syndrome (GTPS) is a common complaint for which patients present to primary care physician's offices. Formerly referred to as Trochanteric Bursitis, this pain syndrome is multi-factorial. Historically GTPS was thought to be related to bursitis affecting one of several peri-trochanteric bursae. However, many studies using MRI and gross dissection have failed to demonstrate a significant presence of inflammation or distended bursae in patients suffering from GTPS. There has also been a paucity of bursitis found in GTPS patients, present on ultrasound and MRI in only 20.2% of patients.1 Additional etiologies proposed for GTPS include gluteus medius and gluteus minimus teno-dynpophathy as well as iliotibial band tendinopathy. GTPS affects 10-25% of the general population, with an annual incidence of 1.8 per 1000 patients per year, and is more common in women by a factor of 4.1.1,2,3 There is also a comorbidity of 18-45% with low back pain patients.4 GTPS may cause considerable pain, and has been clinically shown to be responsible for significantly high levels of pain and physical impairments, as well as decreased physical capacity for full time work and poor to fair quality of life comparable to persons with severe hip osteoarthritis.4

GTPS may present with lateral hip pain which may be insidious or begin abruptly. Excessive adduction puts additional strain upon the iliotibial band (ITB) and predisposes it to injury. Excessive adduction also puts an additional strain through the gluteus medius and minimus muscles.5 GTPS is a common occurrence among sedentary persons, as well as running athletes, particularly if their gait crosses the midline. In addition to these traditional GTPS populations, during the first year post stroke, 29 of 86 patients without pre-existing history of GTPS reported lateral hip pain. Of these 86 patients, 28 patients met the criterion for GTPS, suggesting a relationship between antagonistic muscles and spasticity post CVA.6

HISTORY
Patients frequently complain of lateral hip pain, which is exacerbated by lying on the ipsilateral side or with weight bearing activities. A study seeking to identify history and physical exam factors to help discriminate OA from GTPS found that patients with GTPS could ambulate more than 30 minutes before pain onset, whereas OA patients felt pain in less than 30 minutes. Patients with GTPS also had less difficulty manipulating and putting on their shoes.7 Factors highly correlated with GTPS include ipsilateral iliotibial band tenderness, iliosalpinx and/or contralateral knee symptoms, low back pain and leg length discrepancies.8 BMI was not shown to be significantly related to GTPS.9

Likely etiologies for GTPS may include myofascial pain, trochanteric bursitis, tendinosis and rupture of the gluteus medius and minimus tendon, and external snapping hip, all of which may be secondary to a focal injury seeking to the clinical syndrome. In addition, alternative etiologies such as hip osteoarthritis, lumbar radiculopathy or other spine pathology, avascular necrosis of the hip, fracture or stress fracture of the femur, slipped capital femoral epiphysis as well as referred visceral pain should be considered.10

PHYSICAL EXAM
A thorough neurological and musculoskeletal exam including incitingatory testing such as straight leg raise should be undertaken. Particular care should be given to ascertaining location, quality, severity, as well as exacerbating and alleviating factors to help eliminate alternative etiologies for their pain. Differentiation from hip osteoarthritis is an important but challenging undertaking. There has been debate as to the reliability of physical examination in delineating GTPS from OA. The Altman Criteria (1991) clearly define OA, but do not lend information as to the diagnosis of GTPS. Suggested examinations have included the FABER test, Ober Test, the Trendelenburg Test and palpation of the greater trochanter for pain (sometimes referred to as the"jump sign"). Fearon et al suggest that the FABER test is reliable at distinguishing GTPS but only if the pain reproduction occurs in the lateral hip, with an odds ratio of 43.11 They also calculated the Ober test as having an odds ratio of 13.2 irrespective of the location of pain reproduction.12 Trendelenburg test was found to have 73% sensitivity and 77% specificity for detecting a tendon tear of the gluteus medius.

IMAGING
Several imaging modalities are readily available for investigating lateral hip pain concerning for GTPS. Plain X-Ray, ultrasound and MRI each have a niche in exploring the anatomy and related etiologies such as hip osteoarthritis, lumbar radiculopathy or other spine pathology, avascular necrosis of the hip, fracture or stress fracture of the femur, slipped capital femoral epiphysis and MRI each have a niche in exploring the anatomy and related etiologies. Plain film radiography has been useful in evaluating the articular surface of the joint, but also in identifying calcific tendinitis in up to 40% of patients with GTPS.13 Trochanteric protrusions greater than 2 mm were found to correlate to abnormalities in the gluteus medius or minimus.14 In a study by Steinert et al, 27 of 29 GTPS patients in which trochanteric surface irregularities greater than 2 mm had confirmed abductor tendon pathology.15 Ultrasound examination may show loss of fibrillary architecture suggestive of teninopathy, as well as partial and complete tendon tears. It also is able to provide real-time evaluation of etiologies such as snapping hip.16 Ultrasound is estimated to have a sensitivity of 79% and a PPV of 1.0 for gluteus medius or minimus tears and 61% sensitivity and 100% specificity for identifying bursal pathology. Ultrasound was also shown to correlate very well with intraoperative findings.17 An investigation using ultrasound in the evaluation of GTPS in 877 patients found that 700 (78.9%) did not have bursitis on US, 438 (49.9%) had gluteal tendinosis, and 250 (28.5%) had thickened IT bands.18

TREATMENT

Conservative Therapy
Patients with GTPS are largely successful with conservative measures in alleviating their pain. Rest, ice and anti-inflammatory medications are the cornerstone of initial management. Interventions such as home exercise routines, physical therapy, shock wave therapy, and corticosteroid injections are often effective at reducing pain in GTPS. Home exercise routines include activity modification to avoid repetitive motions or lying on the affected side. Exercises are intended to address the weakness of the hip abductors and include pick-ups stretching, ITB stretching, straight leg raises, wall squats, and gluteal strengthening. After 15 months, this resulted in an 85% remission rate. Initial results at one month, however, were delayed with only a 7% remission rate.19

Extracorporeal Shockwave Treatments (ESWT) was also studied. The shockwave treatment causes cortical inflammation and is believed to help initiate the healing cascade. After receiving three sessions of ESWT, patients demonstrated a 13% improvement at one month, 68% improvement at four months, and at 15 months a 74% remission rate.20 Corticosteroid injections work very well in the short term with 75% improvement at one month, but after 15 months in the above study, patients saw only a 48% remission rate. There is no demonstrable benefit to performing GT steroid injections under fluoroscopy,21 although ultrasound guided needle placement may be effective in ensuring proper needle placement. This is particularly important in patients with larger body habitus, especially as it also offers a meaningful evaluation for tendon pathology.

Surgical Interventions
For patients suffering refractory GTPS pain, and for those for whom a prolonged period of inactivity is intolerable, surgery is an option. There have been several proposed procedures to address GTPS. The most commonly performed is a repair of the gluteus medius or minimus tendons. If there is no gluteal tendinopathy MRI is more costly but delineates soft tissues optimally. MRI may demonstrate T2 hyper intensity in the gluteus medius, gluteus minimus or the peri-trochanteric region. MRI correlates very well with ultrasound for this modality with regards to GTPS.22 Klontzas et all confirmed this finding by reviewing 174 examinations, 91 (52.3%) of which demonstrated peri-trochanteric edema, 34 (19.5%) had distended bursae. Of these 174 examinations, 78 (44.8%) had gluteus medius tendon degeneration. These patients were then examined with provocative tests described above to assess for GTPS. Only 8 of these 79 patients had pain on examination, compared with 4 of the remaining 95 patients without demonstrated degeneration.12

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present, then lengthening of the ITB has been proposed as well as trochanteric bursectomy. These interventions have good efficacy for the recalcitrant GTPS patient. In addition, a recent publication on endoscopic surgical treatment of GTPS has proven effective and safe.12 Future research options:

Osteopathic Treatment & Regenerative Medicine

Osteopathic Manipulative Treatment (OMT) is intended to help support the intrinsic mechanisms for healing within the body by way of improving mechanical factors, removing restrictions to free movement and relieving musculoskeletal barriers, identified as somatic dysfunctions. Osteopathic evaluation for GTPS focuses upon motion dynamics in the lumbar spine and pelvis which may be contributory to creating an aberrant motion dynamic in the femoro-acetabulum which puts excessive strain on the hip adductors. Furthermore, OMT pays particular attention to the role of agonist-antagonist relationships. As has already been discussed, in post-stroke patients who have sudden onset of adductor-antiductor imbalance, GTPS may evolve rapidly and will hinder recovery potential. Restoration of the balance within the hip should be a priority with GTPS patients. Techniques such as muscle energy are of particular utility in this condition. Muscle Energy was first described by Fred Mitchell, Sr. D.O. and involves the positioning of a body segment in a position so as to stretch the targeted muscle to its extreme dysfunctional barrier. Once in this position, a gentle contraction of the afflicted muscle is elicited from the patient, and is resisted isometrically for several seconds. This process is repeated three to five times, with repositioning in the new barrier after each serial contraction-relaxation cycle. Similarly, while performing isolytic muscle energy, the operator meets and exceeds the force supplied by the patient, resulting in a lengthening of the affected muscle during contraction, as well as resetting the dysfunctional barrier.13 Isolytic Muscle Energy treatment of the adductor magnus on the ipsilateral side has a pronounced and immediate effect on Greater Trochanteric pain. A gentle contraction of the afflicted muscle is elicited from the patient, and is resisted isometrically for several seconds. This process is repeated three to five times, with repositioning in the new barrier after each serial contraction-relaxation cycle. Similarly, while performing isolytic muscle energy, the operator meets and exceeds the force supplied by the patient, resulting in a lengthening of the affected muscle during contraction, as well as resetting the dysfunctional barrier.13 Isolytic Muscle Energy treatment of the adductor magnus on the ipsilateral side has a pronounced and immediate effect on Greater Trochanteric tenderness. Anecdotally, it has also shown promise in long term resolution of GTPS, especially when adductor stretching exercises are added to the home exercise regimen, and research into this efficacy of OMT for GTPS is underway.

In addition, research exploring the value of regenerative medicine, i.e. Platelet Rich Plasma (PRP) or prolotherapy has not been pursued to date. However, ESWT has been proven effective in GTPS, and the mechanism of action is analogous to that of PRP and prolotherapy, however PRP and prolotherapy allow for more targeted application of healing elements particularly if aided by ultrasound assisted needle placement.

SUMMARY

GTPS is a pain condition that limits older adults in their capacity to work full time, as well as for athletes whose performance is limited by the pain. It is a complicated clinical condition which may be diagnosed effectively by a history of lateral hip pain, worse with weight-bearing, a positive FABER test with lateral hip pain or a positive Ober’s test. It may be effectively treated by conservative means such as home exercise, physical therapy, corticosteroid injections, and extracorporeal shock wave therapy (ESWT). Current therapies provide either short- or long-term benefit, but should be used in combination to maximize recovery. Refractory cases may be eligible for surgical interventions. Promising clinical adjuncts include osteopathic manipulative treatments and platelet rich plasma (PRP) or prolotherapy treatments to address this condition. Further research into these emerging treatments is needed.

AUTHOR DISCLOSURES:

No relevant financial affiliations

REFERENCES:

1. Long, Susan, David Surrey and Levin Nazarian. Sonography of greater trochanteric bursitis, imaging and intra-operative studies have failed to document significant inflammation for most GTPS patients. Gluteus medius and Gluteus minimus tendon pathology has also been implicated, and surgical repair in refractory GTPS with coexistent tendon pathology does improve pain scoring, however, several studies have documented MRI confirmed tendon pathology in the absence of clinical symptoms, suggesting that this may only play a role in a subset of GTPS patients.

Consideration of the agonist-antagonist theory merits consideration, but to date, no studies have sought to explore this etiology for GTPS. Certainly, Koseoglu et al. have reported a pronounced incidence rate among post-stroke patients, lending credence to the consideration that adductor-antiductor imbalance may pre-dispose patients to the development of GTPS, ITB thickening as well as tears of the gluteus medius and minimus in their attempts to counteract the adductor magnus spasticity. OMT to address these inequities has been effective anecdotally, but clinical research to date is lacking. One study investigating the efficacy of OMT for GTPS is underway.

Clinical Symptoms Associated with Asymptomatic Peripheral Arterial Disease: A Literature Review

Arthur Tarricone, MPH; Ruben Dovlatyan, OMS I; Karla De La Mata, BS²; Joseph S. Coppola, BS³; Prakash Krishnan, MD, FACC

1Cahn School of Medicine at Mount Sinai, New York, NY
2New York College of Podiatric Medicine, New York, NY

ABSTRACT
Background: The incidence and prevalence of Peripheral Arterial Disease (PAD) is rising, yet physician awareness is insufficient. This review aims to increase awareness and detection of asymptomatic PAD in primary care, dermatologic, or podiatric practices through observable symptoms and subtle pathologies concomitant with PAD so patients may benefit from preliminary screening.

Methods: A systematic review of Google Scholar for literature establishing a link between PAD and observable symptoms or pathologies that could be ascertained in primary care.

Results: 31 manuscripts were included. Four discussed examinable symptoms of PAD. Significant ORs predicted PAD by ABI = 0.9 for cool skin, cyanosis, or lower-extremity wounds or sores (6,4, 3.8, 6.0, respectively). Four papers described clinical tests, with diminished capillary refill time, venous filling time, unilateral absence of foot pulses, mild unilateral weakness in foot pulses (OR 8.6), auscultation of femoral bruit (OR 7.8), weak unilateral femoral pulse (OR 3.7), or absent and normal femoral pulses in opposite legs (OR 8.1) significantly predicting PAD. Four papers discussed PAD as an independent predictor of onychomycosis with risk odds-ratio (ROR) 4.8. Six papers investigated onychomycosis’ relation to psoriasis, while another six mentioned psoriasis predicting PAD (OR 6.1) significantly predicting PAD. Four papers described clinical tests, with heightened ability to detect signs indicative of the disease through the patient interview and hands-on techniques may increase the patient’s odds of a favorable outcome.

METHODS
A search for relevant literature was carried out of Google Scholar in December 2017 and January 2018. Below are the specific keyword searches and aggregate number of results. Bracketed phrases were entered into Google Scholar’s advanced search function, “with the exact phrase.” All searches excluded publications before the year 2000. As a basis, the most recent 2016 AHA/ACC Guideline on the Management of Patients with Lower Extremity PAD (see reference 1) was included in the review, as was reference 10, the 2005 ACC/AHA Guidelines article due to the sheer number of references 29 – 31, all studies illuminating a significant relationship between PAD and observable abnormalities on NCS.

This literature review intends to increase awareness of clinically observable symptoms and more subtle associations for asymptomatic peripheral arterial disease that can be recognized in a primary care setting. Ideally, augmenting primary care physicians’ ability to detect patients at-risk of PAD in conjunction with heightened ability to detect signs indicative of the disease through the patient interview and hands-on techniques may increase the patient’s odds of a favorable outcome.

KEYWORDS:
Neuropathy
Peripheral arterial disease
Primary care
Psoriasis, onychomycosis

INTRODUCTION
Peripheral arterial disease (PAD) affects 8.5 million people in the US and is characterized by a loss or reduction of perfusion to the legs caused by atherosclerosis. 14 CDC and NIH data has demonstrated a correlation between risk of PAD diagnosis and age. As of 2016, PAD’s prevalence has risen to an estimated 20% of individuals over 60.¹² Physician awareness and early diagnosis continues to be challenging largely because the majority of PAD cases are asymptomatic. Epidemiologic projections claim that PAD’s prevalence is 27 million individuals in North America and Europe, 16.5 million of which are asymptomatic cases.¹³ This literature review intends to increase awareness of clinically observable symptoms and more subtle associations for asymptomatic peripheral arterial disease that can be recognized in a primary care setting. Ideally, augmenting primary care physicians’ ability to detect patients at-risk of PAD in conjunction with heightened ability to detect signs indicative of the disease through the patient interview and hands-on techniques may increase the patient’s odds of a favorable outcome.

1. Include:
Periarterial arterial disease; detection; awareness; dermatologic; asymptomatic; epidemiology.

2. Include:
Peripheral arterial disease; [critical limb ischemia]; [diabetic foot]; lower extremity; ulcer; vascular; management; skin; assessment classification.

3. Include:
Peripheral arterial disease; dermatology; skin; examination; risk factor; epidemiology.

RESULTS
A total of 31 sources were retrieved for review and discussion in this literature review using the methods section outlined above.

\[\text{PAD: peripheral arterial disease}\]
\[\text{ABI: Ankle-brachial index}\]
\[\text{OR: Odds ratio}\]
\[\text{ROR: Risk odds ratio}\]
\[\text{LEA: Lower extremity amputation}\]
\[\text{PTP: Posterior tibial (artery)}\]

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| Arthur Tarricone, MPH | arthur.tarricone@mountsinai.org | Osteopathic Family Physician (2019) 22 - 29 | Osteopathic Family Physician | Volume 11, No. 3 | May/June, 2019 | 25 |
| Osteopathic Family Physician | Volume 11, No. 3 | May/June, 2019 | 25 |
Six sources were included from Search 1, three sources from Search 2, and a total of 16 sources were included from Search 3. Three sources were included from Search 4. The two sources included in this section not obtained through the three outlined search algorithms are the 2016 and 2005 ACC/AHA Guidelines for the Management of Patients With Peripheral Arterial Disease, references 1 and 2, respectively.

**PHYSICAL EXAM**

A total of four reviewed papers discussed symptoms discoverable through physical examination requiring no specialized equipment that indicated PAD. Examination of the lower extremities for “absence of hair growth,” namely on the toes, “perspiration, dry skin, and cool temperature” are easily identifiable and may indicate subtle changes in physiology as a result of reduced lower-extremity perfusion.

Cooler, bluer skin (cyanosis) is one common sign of PAD, though a more severely ischemic foot can appear pink and warm “because of arteriovenous shunting.” A large-scale study on 2,455 Netherlandish participants demonstrated significant ORs for predictability of PAD by Ankle-Brachial Index (ABI) < 0.9 from cool skin (OR 6.4), discolored skin (particularly cyanosis, OR 3.8), and wounds or sores on the lower extremity (OR 6.0) (Figure 1).

“Calf atrophy, dependent rubor and elevation pallor, loss of hair over the dorsum of the foot, thickening of the toenails, and shiny, scaly skin due to the loss of subcutaneous tissue...are indications of severe tissue ischemia,” requiring immediate evaluation and treatment.

**CLINICAL TECHNIQUES**

Four papers in this review discussed palpation techniques performable by all general practitioners with common medical equipment. Mohler III’s literature review claims superficial femoral artery (SFA) stenosis, the most common form of PAD, is typically characterized by normal femoral pulse and absent distal pulses.

In the Buerger Test, the clinician instructs the patient to lie supine, and slowly elevates the leg evaluating for the development of pallor in the limb (a positive test), and noting the angle at which pallor develops. Though this review did not find any studies directly comparing the effectiveness of the Buerger Test to an ABI and predictability of PAD, the Buerger Test can indicate issues with circulation to the leg through determining the dependent angle for circulation, and easily segway into an exam for venous filling time.6 Capillary refill time after relieving manual pressure to the plantar aspect of the great toe is associated with PAD (LR 1.90), as is venous filling time greater than 20 seconds (LR 3.6) to a vein identified in the Buerger test with the patient now sitting upright with legs hanging down.7 Absence of unilateral posterior tibial (PT) and dorsalis pedis (DP) pulses predict ABI < 0.9 (LR 3.57), as does auscultation of a femoral bruit (LR 2.90) (Figure 2). The study on Netherlandish patients demonstrated predictability of ABI < 0.9 in patients with normal femoral pulse in one leg and absent in the other (OR 6.1), weak unilateral femoral artery pulse (OR 3.7), and femoral bruit (OR 7.8). Additionally, if one foot lacked both DP and PT pulse or if one of these was absent while the other weakened, this was also a found to be a strong, significant predictor for ABI < 0.9 (OR 30.4), as was any unilateral weakened foot pulse (OR 8.6) (Figure 3).
ONCHOMYCOSIS

Four sources in this review directly demonstrated an epidemiological relationship between PAD and the fungal toenail infection, onychomycosis. Identified by abnormal toenail growth and confirmed through lab pathology, onychomycosis was shown to affect 35% of patients visiting a vascular clinic for PAD, confirmed by ABI < 0.8. In another study, 83.3% of smokers of at least two packs per day suffered from onychomycosis, and PAD remained a predictor of onychomycosis even when adjusting for the effect of smoking (OR 4.8).23 Onychomycosis affected 22% of elderly diabetic patients in another.24 Patients with diabetes (the other known risk factor for PAD besides age) were three times as likely to suffer from onychomycosis than those without diabetes.25

PSORIASIS/ONYCHOMYCOSIS

Six papers discussed the concomitance between psoriasis and PAD or classic PAD-related risk factors. A major data review of the Miami VA Medical Center Database found that psoriasis carried an OR of 1.98 to PAD, as determined by previously entered ICD-9-CM codes in the database.26 27 Early electron microscope studies showed onychomycosis in 13% of psoriatic patients, and a 27% prevalence of any fungal nail infection in psoriatic patients with any nail abnormality in 1997.28 Yeast-like fungi and molds were uncommon. In 2004, Hamnerius and colleagues found no difference in prevalence of onychomycosis in psoriatics vs. non-psoriatics.29 Larsen and colleagues showed no difference in 2003 in prevalence of onychomycosis in their psoriatic vs non-psoriatic subjects, but they did find a higher percentage of yeast colonization in those suffering the toenail infection in the psoriasis group.30 31 Stander and colleagues found a large difference in prevalence of yeasts in subjects with directly psoriatic nails (23.9%) vs. psoriatics without nail abnormalities (6.1%) in 2001, with similar results in Staberg and colleagues’ 1983 study.32

PSORIASIS

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PERIPHERAL NERVE CONDUCTION STUDIES

Four direct studies were found illuminating a relationship between PAD and peripheral nerve performance. Participants without diabetes demonstrated significantly diminished peroneal motor, sural sensory, and ulnar sensory nerve conduction velocity, amplitude, and onset latency (p < 0.05) in unadjusted analyses. The effect persisted in unadjusted analyses of patients with diabetes but only in conduction velocity of the peroneal motor nerve, and velocity lasted of the ulnar sensory nerve. Though diabetes was a peripheral neurodegenerative effect may be a confounding variable in the effect of PAD on nerve conduction, this study suggests the possibility of an independent effect of PAD. After adjusting for several confounding variables including but not limited to age, sex, and smoking status, nerve function was still significantly diminished in the peroneal motor and ulnar sensory conduction velocity, and sural sensory impulse amplitude33 34 (Figure 4). In a study on participants aged 60+, individuals determined to have PAD by ABI < 0.9 were found to have slower nerve conduction velocity of the peroneal nerve (44.16 ± 43.94 m/s, p = 0.003), consistent with findings in Mcdonald et al. 2006.35 Adding to the evidence of the interplay between diabetes and PAD on peripheral nerve abnormalities, a study on 240 Chinese participants categorized their subjects into three groups: confirmed diabetes (determined by presenting symptoms and abnormalities on NCS), subclinical diabetes (symptoms consistent with diabetic peripheral neuropathy, but no abnormal findings on NCS), and those without diabetic peripheral neuropathy (control). The study found significantly higher prevalence of PAD as determined by ABI < 0.9 in their confirmed group than either the subclinical or control group (18%, 7.7%, and 3.4%, respectively).36 Finally, a study recruited patients in Greece and determined early-stage PAD through clinical decisions based on patient history and physical exam. Lack of ABI in the determination of PAD may detract from the study’s validity. In any case, a dynamic wave study, a specialized test that can be added to a routine NCS, demonstrated to the experimenters that patients with PAD experienced significantly greater F-wave duration in the tibial motor nerve than pre-exercise (average 16.3 ± 3.5 vs. 13.9 ± 2.9, p = 0.017). The non-PAD control group experienced no difference pre and post-exercise.37

FOOT ULCERATION

Five papers in this review discussed the characteristics of ulcers that specifically result from or relate to PAD. PAD specifically causes arterial ulcers38, appearing “punched out,” with a deep, necrotic wound base typically on the lateral malleolus, tibial regions or other pressure points. Unrelated venous ulcers are shallower, containing “granulation tissue or yellow fibrin,” and are commonly between the lower calf and medial malleolus. Arterial ulcers, particularly in patients with severely diminished ABIs, do not heal properly without revascularization.17 The Eurodial study on diabetic foot ulcers examined the relationship between PAD and wound-healing, finding PAD by ABI < 0.9 in 49% of participants presenting with diabetic foot ulcers, and were more likely to have infection in their ulcer than non-PAD participants (63% vs. 53%, p < 0.05).39 40 The one-year follow-up of this study found that 23% of participants still had not yet healed, PAD being an independent predictor of non-healing with OR 2.1, 38

DISCUSSION

Despite the rising incidence of PAD, physician awareness can be modified; an Illinois survey of internists presenting with a hypothetical case of an obese 65-year-old male with hypertension, showed only 37% responded that they would attempt to obtain a history concerning PAD.41 Furthermore, the US PARTNERS Program study including over 6,417 diabetic smokers found in ages 50 and 69 determined that of the 29% of participants with PAD, 55% received their diagnosis only from the ABI administered at screening.42

Claudication is the classic finding in symptomatic PAD, however, this may be missed by patient changes in lifestyle. A detailed history and physical exam may be able to determine patient changes in physical activity due to asymptomatic PAD alerting the physician to PAD workup. This review illuminates certain clinically observable symptoms, including excremable skin abnormalities, findings in clinical techniques, onychomycosis, psoriasis, and NCS findings that may be used as a clue to underlying PAD. Asymptomatic diagnosis can be made by positive ABI, a clinical measure of lower extremity arterial disease to toe systolic pressure at the arm obtained with a pressure cuff.2 Having been demonstrated as to be over 90% specific and sensitive,2 38 it is explicitly recommended by the American Association of Cardiology and American Heart Association for accurate PAD diagnosis.37

The under-diagnosis of asymptomatic PAD is an issue in United States healthcare. End stage PAD will progress to Critical Limb Ischemia (CLI) and 20% of patients diagnosed with CLI die within 1 year, while another 20% suffer a lower-extremity amputation (LEA) in the same year. Of all patients with PAD presenting with claudication, 5% progress within five years to receive LEA.43 44 45 46 47

15% of PAD patients at any stage presenting with non-healing diabetic foot ulcers undergo a major LEA within one year, of which 15% die within one year and nearly 50% within 5 years.48 PAD can also result in complications like stroke, myocardial infarction, and angina, but as its core, a PAD diagnosis is associated with a five-year death rate of 33.2%.1 49 This systematic review was conducted in order to increase awareness of less-common pathologies or physically observable symptoms coinciding with asymptomatic PAD in primary care. Increased awareness can lead to early diagnosis, which may improve patient outcome.

CONCLUSION

There are several predictive findings of PAD that can be identified in the primary care setting, including dermatological abnormalities, positive findings on several clinical techniques, and presence of psoriasis, onychomycosis, or NCS abnormalities. Early diagnosis of PAD may lead to improved patient outcomes. PCPs are functionally patients’ first line of defense within the bounds of medical practice against disease. Given the growing incidence and prevalence of PAD in the US population, difficulty in diagnosing asymptomatic disease until late stages, as well as the dire late-stage prognosis of PAD, it is paramount that PCPs be aware of the disease’s scope, and take the extra time in their practice to palpate for lower-extremity pulses, auscultate bruits, perform a thorough physical exam, and ask relevant clinical questions in the patient interview so that sings of asymptomatic disease can be detected earlier. Such steps may be key in the preventing complications, particularly in at-risk populations such as the elderly, diabetics, and smokers. These practices, if put into place regularly, may lead to earlier-stage diagnosis, subsequent treatment, and finally improved prognoses in PAD.

AUTHOR DISCLOSURES:

REFERENCES:


26 27 Osteopathic Family Physician  |  Volume 11, No. 3  |  May/June, 2019

Tarricone, Dovlatyan, De La Mata, Coppola, Krishnan Clinical Symptoms Associated with Asymptomatic Peripheral Arterial Disease
Correspondence: Bernadette Riley, DO, FACOPF, FILM | briley@nyit.edu

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Curriculum on Developmental Disabilities in Family Medicine Residency

Bernadette Riley, DO, FACOPF, FILM
NYIT College of Osteopathic Medicine, Old Westbury, NY

INTRODUCTION

According to the Center for Disease Control there are approximately one in six children in the United States living with developmental disabilities (DD). Since the American Disability Act was passed in 1990, new laws have been put into place to expand opportunities for Americans living with all types of disabilities. Developmental disabilities are a group of conditions due to an impairment in physical, learning, or behavior areas. DD occurs before the age of 22, and last throughout one’s life. “Developmental disabilities (DD) occurs before, during, and after birth and can range from mild to severe.”

In the United States, the most common form of DD is an intellectual disability, followed by cerebral palsy and autism spectrum disorders (ASD). Most family medicine physicians in the US will encounter a patient with DD. Family physicians must realize that they need to be aware of the care for patients with DD. This training should continue to occur during the Family Medicine Residency. With the Single GME Accreditation System, the osteopathic family physician needs to be properly trained in treating and identifying patients with developmental disabilities. This training should continue to occur during the Family Medicine Residency. The osteopathic family physician needs to be properly trained in treating and identifying patients with developmental disability. This training should continue to occur during the Family Medicine Residency.

WHY THE OSTEOPATHIC FAMILY MEDICINE COMMUNITY NEEDS TRAINING ON PATIENTS WITH DD

Since some developmental disabilities are increasing in frequency among the US population, the osteopathic family physician needs to be educated in not only treating, but also identifying this population. In 2017, at the American Medical Associations’ House of Delegates (AMA HOD), a resolution was passed that the “AMA encourage graduate medical education programs to develop and implement a curriculum on providing appropriate and comprehensive health care to people with DD.” In July 2018 the AOA House of Delegates (AOA HOD) approved resolution H-211 that states “that the AOA encourage osteopathic medical schools to develop and implement curricula on the care of people with developmental disabilities.”

With the passage of resolutions by the AMA in 2017, the AOA in 2018, and the Single GME Accreditation System in place, it is imperative that the osteopathic community recognize the importance of training our residents on patients with DD. Osteopathic Family Medicine residents should be trained to recognize and properly treat patients with DD during their residency.

NEED FOR TRAINING NOW

In a recent survey, the majority of medical and dental students surveyed expressed inadequate competency in the care of patients with DD. Drs. Holder, Waldman, and Hood showed in this study that medical and dental residency program directors “indicated a need for additional training for their residents.” This further shows the need for training in family medicine programs. The reason why this curriculum is imperative is that “persons with disabilities are an unrecognized health disparity population.”

Often times the patient with a developmental disability interacts first with a family medicine physician before any other specialty. It is imperative that osteopathic family medicine residents are trained in properly identifying patients with DD.

BARRIERS TO CARE FOR PATIENTS WITH DD

Children and adults with DD have more barriers to health care than others. One barrier patients with DD have is a financial one, as patients with DD often have economic barriers, and may depend on government aid or other sources for financial help for medical and/or living expenses. There is also a stigma and prejudice associated with DD, and the health care provider can also stigmatize about patients with DD. For clinicians who have not been trained in DD, many feel ill-prepared to deal with the patient with DD. Through exposure to individuals with DD, the clinicians can see whether they show an “unconscious bias” to patients with DD. This bias can be addressed, recognized and possibly remediated during family medicine training so that the resident graduates have a better understanding of caring for patients with DD. Many patients with DD have physical barriers to accessing care. These include walking devices, such as wheelchairs or auditory aids that may make it challenging for a patient with DD to get to the doctor. Patients with DD can sometimes present communication challenges with their healthcare providers. Since “effective two-way communication is foundational to person-centered care” this can present an issue in the developmentally disabled population. The family medicine resident can identify barriers to care that may be in place and learn to use a variety of methods to care for this population.

HEALTHCARE PROFESSIONALS ALREADY UTILIZING A CURRICULUM ON PATIENTS WITH DD

Dental schools across the USA have realized the need of having a curriculum in patients with DD for over a decade. In 2004, The Commission on Dental Accreditation adopted standards to “prepare dental professionals for the care of persons with DD.”

There are many secondary dental comorbidities seen in patients who have DD. The dental community has revised many standards, and education has been updated as the environment surrounding DD has changed. Dental schools have ensured that all US dental graduates are trained in dealing with patients who have DD. Substantial research has been done in the dental community on patients with DD. The time is now for the osteopathic family physician to also ensure proper training in patients with DD.

DIFFERENT STRATEGIES TO MEET DD CURRICULUM REQUIREMENTS

There are many ways that the dental community has tried to educate their dentists on patients with DD. One avenue dental professionals have used to educate learners is by incorporating simulation to teach the provider about DD. This type of model can be used with a “flipped classroom” setting, where students are exposed to video or modules before their in-person face to face, or simulation. This is beneficial as the learner can go at their own learning pace, and can prepare properly for their face to face teaching session with faculty. Research has shown that the “flipped classroom” method has been used to teach medical students regarding new developmental disability law and practice with good results. This type of learning is a good way to engage family medicine residents in their training programs without using a lot of time and financial resources. The osteopathic family medicine community can start with a module using the flipped classroom as a way to educate learners. Research from the dental community can help facilitate the family medicine training curriculum for residency programs.

Exposing family medicine residents to simulated scenarios involving children and adults with DD can help the trainees become comfortable taking care of the patient with DD. A study by Drs. Kleinert HL, Sanders C, Minj, Nash D, Johnson J, Boyd S, Challman showed dental students who were exposed to a “virtual patient module” of a developmental disabled child felt satisfied and prepared for a real patient encounter. “Educational encounters including personal encounters with patients, modeling by mentors, and reflective activities can foster qualities such as compassion and empathy.” Both of these qualities are imperative to the family physician, and for participating in the care of a child or adult with DD.

Some curriculum regarding DD incorporate simulation scenarios where “patients with disabilities [serve] as medical educators.” At Tufts University School of Medicine, “people with disabilities, in the role of “standardized” patients, portray patients with a common primary care complaint in simulated medical interviews.” This simulated learning environment can be especially promising for...
the osteopathic family medicine resident, where the resident can evaluate their encounter with a developmentally disabled patient.

Another avenue where family medicine residents can be taught about patients with DD is during a rotation. Clinical rotations and clinical clerkships can expose the trainee and student to patients with DD.11, Graham et al. showed how exposing third-year medical students on their family medicine rotations to a 90-minute curriculum on patients with “mobility and cognitive impairments” helped the students’ “knowledge and attitude” on the topic.9

PATIENTS WITH DD AND LONG-TERM ISSUES

There are long-term issues that need to be addressed for a patient with DD. Formal standardized training should be incorporated into family medicine residency to address these long-term issues. A Canadian study by Dr. Sullivan et al. showed that treatment of a developmentally disabled patient involves “caregivers, adapting procedures when appropriate and seeking input from a range of health professionals.”10 This type of comprehensive care is seen every day in the continuity of care that family physicians encounter.

OSTEOPATHIC MEDICAL COMMUNITY AND DIAGNOSIS OF DD

By incorporating curricula on DD in family medicine residency, the physician can identify a patient with a DD. This is especially important for identifying patients who would benefit from early intervention.12 Since “one-half of American children with DD [are] not identified by the time they enter kindergarten” these patients lose valuable opportunities for early intervention strategies.13 Osteopathic family physicians who conduct well visits and testing on specific developmental traits can identify a patient who has a developmental disability. Identifying these patients in early childhood would help the patient and caregiver find appropriate care and access appropriate services. Family medicine residents can also ask caregivers and parents to help access the need for early intervention.14 By training our osteopathic Family Medicine residents in early intervention, this can potentially lead to greater recognition of patients with DD, and potential help and aide earlier in their diagnosis.

CONCLUSION

With the passage of the AMA and AOA-HDO resolutions encouraging implementation of a curriculum on patients with DD,15 and the Single GME Accreditation System finalizing in 2020, now is the time to standardize the curriculum for family medicine residents on DD. The osteopathic family medicine community should recognize and encourage a model for identifying and treating patients with DD. By standardizing this curriculum and ensuring that Family Medicine resident get training in this population we can ensure appropriate care for the growing number of patients with DD. This curriculum can also help identify the disparity that exists in healthcare for patients with DD and can help address the need to lose valuable opportunities for early intervention strategies.

AUTHOR DISCLOSURES:
No relevant financial affiliations

REFERENCES:

Eyelid Abnormalities in 76-Year-Old Male

Leonid Skorin, Jr., DO, OD, MS1; Marisa Asheim, BS2

1 Mayo Clinic Health System, Albert Lea, MN
2 Pacific University College of Optometry, Forest Grove, OR

A 76-year-old male presents with complaints of frequent eyelid and eye infections. He notes constant dry, yet watering eyes and matting of his eyelashes. He has no history of eyelid surgery or trauma and denies any past history of facial weakness. On physical examination, the patient could not fully close his eyes with normal blinking (Figure 1). In addition, there was an outward turning of the lower eyelids leading to excess tearing. He was placed on a dry eye treatment regimen of lid scrubs, lubricating artificial tears and ointment, warm compresses and lid taping at bedtime. This brought some relief to the patient’s symptoms; but, he still was not completely satisfied.

QUESTIONS

1. Based on Figure 1, what is the diagnosis?
   A. Lagophthalmos
   B. Ectropion
   C. Involutional
   D. Ptosis
   E. Bell palsy

2. Based on the finding of outward turning lower eyelids, what is the diagnosis?
   A. Ptosis
   B. Ectropion
   C. Involutional
   D. Blepharitis
   E. Dermatochalasis

3. What is the most common etiology of the condition in Question 2?
   A. Congenital
   B. Paralytic
   C. Involutional
   D. Cicatricial
   E. Mechanical

ANSWERS:

1. Based on Figure 1, what is the diagnosis?
   Correct Answer: A) Lagophthalmos
   Lagophthalmos is the inability to close the eyes completely and is caused by a variety of conditions. Ectropion, or an excessively protruding eye, can cause an inability to close the eyes but will show a more prominent globe with visible sclera. Myasthenia gravis will cause ptosis and progressive weakening of the upper eyelid throughout the day but does not always result in an inability to close the eyelids completely. Orbital fat prolapse, a benign finding related to aging, will present with a prominent yellow-white elevated mass under the conjunctiva. Although Bell palsy will cause lagophthalmos, this patient denied a history of facial weakness, so the condition was ruled out.

2. Based on the finding of outward turning lower eyelids, what is the diagnosis?
   Correct Answer: B) Ectropion
   Ectropion is the outward turning of the eyelid margin, as shown in Figure 1. Ectropion is characterized by the opposite finding, an inward turning of the eyelid. Blepharitis is an inflammation of the eyelids that results in red, irritated eyes. Patients with blepharitis will experience crusts, flaking, eyelids sticking together and often complain of gritty, burning, greasy and itchy sensations. Ptosis is the weakening of the levator muscle which causes drooping of the upper eyelid.

3. What is the most common etiology of the condition in Question 2?
   Correct Answer: C) Involutional
   Ectropion is most commonly involutional (age-related) and caused by relaxation of tissue that leads to eyelid laxity and punctal eversion. Paralytic ectropion is often due to 7th nerve palsy and is usually temporary. Congenital ectropion is rare and usually associated with Down syndrome or ichthyosis. Cicatricial ectropion can be caused by trauma, chemical burns, surgery or scarring. Eyelid tumors, herniated orbital fat, conjunctival chemosis or other anatomical abnormalities can lead to mechanical ectropion.

DISCUSSION

Although lagophthalmos is commonly caused by thyroid ophthalmopathy, in this patient it was secondary to ectropion. Lagophthalmos can also be caused by scarring, tumor, Bell palsy or after blepharoplasty and ptosis lid repair. The incidence of lagophthalmos increases with age and occurs more frequently in females. An estimated 5% of the normal population has lagophthalmos but many consider it to be a commonly underdiagnosed condition. This condition may show staining of the inferior corneal surface and eye irritation that is worse in the morning. This staining is known as exposure keratopathy when the inferior corneal surface dries and breaks down while the patient is sleeping.

Ectropion in adults is most commonly age-related; more rarely, the condition may be paralytic, cicatricial, inflammatory or mechanical. Involutional ectropion is the result of eyelid tissue relaxation and horizontal lid laxity and presents with eversion of the lower eyelid and punctum.

Involutional ectropion is a progressive condition, so there may be no initial symptoms or mild complaints of dry or watering eyes. In more advanced stages, foreign body sensation, mucus discharge, pain, or even decreased vision may be noted.

One of the first signs of involutional lower lid ectropion is punctal eversion which prevents tears from draining properly and can lead to epiphora. As the condition worsens and the lower eyelid begins to droop more, exposure of the cornea may occur. This will present as superficial punctate keratitis of the cornea and, in severe cases, ulceration. With chronic exposure, the eyelid can become inflamed and result in redness, keratinization of the conjunctiva and thickening of the tarsal plate. Chronic damage to the surface of the eye and eyelids makes patients susceptible to infection and more inflammation, leading to progression of the ectropion.

EVALUATION

Prompt identification and initiation of treatment by the patient’s family physician can greatly improve the quality of life of these patients. The following tests are useful in determining the presence and degree of involutional ectropion.

Distraction test: Pull the lower lid away from the globe and note the maximum displacement of the eyelid margin. If the distance is >10 mm, ectropion is present (Figure 2).

FIGURE 2: Distraction test showing >10 mm displacement of the eyelid margin from the globe in our patient.
Lateral canthal tendon laxity: An abnormal lateral canthus may have a more rounded appearance and can be displaced medially more than 2mm (Figure 5).²

FIGURE 5: Lateral canthal tendon laxity test showing >2mm displacement.

Medial canthal tendon laxity: Pull the lid temporally and observe the lateral movement of the inferior punctum. Lateral movement of the inferior punctum >1-2mm is considered normal, the punctum displaced to the limbus (arrow is showing position of the punctum). (Figure 3)

Lagophthalmos: Have the patient gently close their eyes, as if they are sleeping. If the eyelids don’t touch completely or the inferior part of the eye is visible, the eyelids should be taped at night to prevent ocular surface damage (Figure 1).

TREATMENT
Conservative treatment should be attempted before corrective surgery is performed. Reducing corneal and conjunctival exposure is the primary concern, so artificial tears, gels and ointments may be administered throughout the day and before bed (Table 1 shown on page 35). At bedtime, the eyelids may be taped shut to prevent nocturnal lagophthalmos. The patient should be reminded not to rub their eyes which can exacerbate the problem. When conservative treatment is no longer sufficient, referral to an ophthalmologist or oculoplastic specialist for eyelid surgery should be considered.

TREATMENT

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<tr>
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<td>AMO</td>
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<td>GenTeal PM</td>
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*CMC: carboxymethylcellulose

Note: this is not an exhaustive list of all available over-the-counter products

REFERENCES:
CALENDAR OF EVENTS

JUNE 7 – 9, 2019
Maine ACOFP – Annual Oceanside Convention
Samoset Resort, Rockport, Maine

JUNE 27 – 29, 2019
Direct Primary Care Summit
Hyatt Regency O’Hare, Rosemont, Illinois

JULY 31 – AUGUST 4, 2019
Florida ACOFP
Omni Champions Gate Resort, Orlando, Florida
www.fsacofp.org

AUGUST 8 – 11, 2019
Michigan ACOFP Summer Family Medicine Update
Park Place Hotel, Traverse City, Michigan
www.macoefp.org

AUGUST 9 – 11, 2019
Annual POFPS CME SYMPOSIUM
Hershey Lodge, Hershey, Pennsylvania
www.poma.org

JULY 31 – AUGUST 4, 2019
ACOFPCA43 CME Seminar
Anaheim, California
www.acofpca.org

AUGUST 8 – 11, 2019
Michigan ACOFP Summer Family Medicine Update
Park Place Hotel, Traverse City, Michigan
www.macoefp.org

AUGUST 9 – 11, 2019
Annual POFPS CME SYMPOSIUM
Hershey Lodge, Hershey, Pennsylvania
www.poma.org

JULY 31 – AUGUST 4, 2019
Florida ACOFP
Omni Champions Gate Resort, Orlando, Florida
www.fsacofp.org

AUGUST 8 – 11, 2019
Michigan ACOFP Summer Family Medicine Update
Park Place Hotel, Traverse City, Michigan
www.macoefp.org

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Anaheim, California
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2018 ATTENDING PAPER OF THE YEAR AWARD
“Current Concepts in the Office-Based Treatment of Concussed Athletes”
Presented to
Robert Franks, DO, FAOASM
Danielle Chase, PhD
Ronald Torrance II, DO

2018 RESIDENT PAPER OF THE YEAR AWARD
“Approach to Polyarthritis for the Primary Care Physician”
Presented to
Arielle Freilich, DO

2018 STUDENT AUTHOR OF THE YEAR AWARD
“Abnormal Uterine Bleeding: An Age Based Approach”
Presented to
Heather Johnston, OMS

CME Resource: Osteopathic Family Physician Offers 2 Hours of 1-B CME
ACOFP members who read Osteopathic Family Physician can receive two hours of Category 1-B continuing medical education credit for completing quizzes in the journal. Visit the eLearning Center at www.acofp.org to access the quizzes.
Peripheral Artery Disease (PAD) is caused by plaque build-up in the arteries bringing blood to your arms, legs, organs, and brain. The plaque is formed by cholesterol, fat, calcium, fibrous tissue, and other blood products. After damage to your arteries, the body begins to heal and the healing may cause plaque to form at the site of damage. The plaque hardens and narrows arteries. The plaque can also break off, further damaging the arteries and causing a blood clot to form at the site. Plaque or blood clots can limit the flow of oxygenated blood through the arteries to tissues. PAD can cause a variety of issues ranging from pain to skin changes.

WHAT ARE MY PAD RISK FACTORS?
The American College of Cardiology/American Heart Association (ACC/AHA) identified certain groups with an increased risk such as:
- Over 70 years
- Age 50 to 69 years with a history of smoking or diabetes
- Age 40 to 49 with diabetes and at least one other risk factor for atherosclerosis, including:
  - Male gender
  - Black ethnicity
  - Family history of atherosclerosis
  - Smoking
  - High cholesterol
  - High blood pressure
  - Homocysteinemia
- Abnormal lower extremity pulse examination
- Known atherosclerosis

HOW PAD IS DIAGNOSED
If PAD is suspected, your doctor can diagnose PAD by comparing the blood pressures of a patient’s ankles and arms and running different neurological and blood tests.

HOW TO PREVENT PAD
No organization currently recommends routine screening for PAD in a patient with NO symptoms, the USPSTF does recommend ways to reduce risk. The best way to avoid PAD is to limit the amount of arterial damage. This includes smoking cessation, a heart-healthy diet, medications, and blood pressure control.
Over 40 Category 1-A CME credits anticipated, including 9.5 Category 1-A extra credits beginning on August 22

The ACOFP Intensive Update & Board Review in Osteopathic Family Medicine is an intensive workshop for family physicians and residents who want to update their knowledge, as well as for those preparing for their board exams.

Learn more and register at acofp.org