REVIEW
From the Editor,
Kenneth Noonan, MD
Since the last edition of the POSNA Resident Review, a horrific natural calamity struck in our neighboring country of Haiti. An estimated 500,000 Haitians were either killed or injured in the days following the earthquake of January 12. The bulk of surviving patients had crushed limbs and spines, at least a third of those injured were children. An amazing international outreach effort rapidly ensued and in the midst of this effort were many dozens of pediatric orthopaedists from all over the world. As pediatric orthopaedists our specialty is uniquely suited to apply non-operative and operative methods regardless of patient age. In this edition of the POSNA Resident Review we highlight a Resident (A. Socci MD) and Consultant (M. Vitale, MD) who have contributed in Haiti. We also take the opportunity to interview Dr. Kaye Wilkins; who has given decades of his life to education and service in underserved countries. He epitomizes one of the major missions of POSNA...service to children everywhere.
Rounding out this edition are OITE style questions on Pediatric Foot Conditions and articles on the Pediatric Orthopaedic Match and the upcoming IPOS Meeting in Orlando in early December.

Challenging Cases: What Would You Do?

CASE #1
An 11 year old girl presents with a history of bilateral foot and ankle pain which she noted after a hiking trip with no definite injury. Examination reveals painful and limited subtalar motion with peroneal spasm. Radiographic image of her most symptomatic foot is shown below in Figure 1. Treatment course should include:
A. Calcaneal sliding osteotomy
B. Triple arthrodesis
C. Resection of bar and interposition of extensor digitorum brevis
D. Resection of coalition and interposition of flexor hallucis longus tendon
E. Physiotherapy and bracing and failing this...peroneus longus lengthening

Your Response: ___

Discussion
The oblique foot view shows a coalition (bar) between the calcaneus and navicular. This is the most common type of tarsal coalition and is best seen on the oblique foot radiograph. Treatment includes a course of nonoperative bracing or immobilization followed by operative intervention if symptoms persist. Resection of the coalition is usually coupled with interposition of extensor digitorum brevis or fat graft to prevent recurrence and has been reported to give satisfactory results in 80% of cases (Level IV evidence). Interposition of the flexor hallucis longus tendon may be considered after resection of a subtalar coalition (the second most common location). Calcaneal osteotomy and triple arthrodesis are salvage procedures in the case of advanced arthritis or failed previous surgery. Peroneal spasm is thought to be a mechanism to reduce pain by splinting subtalar motion. Historically, hindfoot coalitions were referred to peroneal spastic flatfoot and attempts to relieve symptoms with peroneal lengthening failed.

The correct answer is C.

References

CASE #1, continued
Pediatric Orthopaedic Profile: Dr. Kaye Wilkins, DVM, MD

By: Ken Noonan, MD

There are certainly those who don’t know Dr. Kaye Wilkins personally; yet every English reading orthopaedic resident in the last 2 decades has been influenced by his expertise in pediatric elbow trauma and he has written and taught on many other topics. He has also taken his expertise internationally and has taught pediatric orthopaedics in over 50 different countries. Kaye has held many leadership positions in academic medicine including the presidency of Pediatric Orthopedic Society of North America (POSNA) in 1987.

Kaye was born in 1934 and eventually his family settled in Kirkwood, Missouri. During his high school years he was fortunate to work in an animal hospital which stimulated his general interest in biology and specifically in Veterinary Medicine. He completed his undergraduate and graduate studies at Colorado A&M and he received his DVM in 1958. Although he enjoyed large and small animal medicine; he felt his future belonged farther up the evolutionary ladder. Thus he was accepted to Southwestern Medical School in Dallas, Texas where he completed medical school and his orthopaedic residency training. Upon completing his residency in 1966, he served in the USAF for two years at the height of the Vietnam War.

Kaye has been married to his wife Sidney for 53 years; he credits his success to her unflagging support and guidance. He firmly believes that the most important decision in his life was to marry her. Together they have raised 3 successful sons who have taken leadership positions in academia, ministry and education. When asked the secret to his success, he states…” Do what you love to do and do it with lots of energy. However remember that one’s primary goal is to provide a caring secure and loving environment for their family.” Put another way, Dr. Wilkins states, “Many people think that I have been teaching in countries with limited resources during my whole professional life, when in actuality it has only been within the last 15 years. Up until then I focused on three areas of my life: 1. Taking good care of patients in my practice. 2. Getting my three sons educated and 3. Saving up for retirement so that I could eventually dedicate more time to educate in other countries.

The Editorial Staff of the POSNA Resident Review recently interviewed him for this edition……

What led you to Career in Pediatric Orthopaedics?

In orthopaedics residency, I felt connected to children and became interested in pediatric orthopedics during my rotations at Scottish Rite Hospital. At that time there were very few individuals doing only pediatric orthopedics and there were only four fellowship programs in North America. I was fortunate to do my fellowship at the Hospital for Sick Children in Toronto which was, and still is one of the premier pediatric orthopedic programs in the world.

My fellowship was a real turning point in my career. I was able to be on the ground floor of both a newly developing orthopedic subspecialty and the Pediatric Orthopedic Study Group (the precursor to POSNA). This association provided many international contacts which I subsequently used to develop my various international teaching conferences.

You have an international reputation in pediatric trauma.

Why did you choose this field?

This actually was the result of my decision to join Drs. Charles Rockwood and David Green in the Department of Orthopedics at the University of Texas Health Science Center at San Antonio. They recruited me to construct a chapter on elbow fractures in the edition dealing with adult fractures at the last minute when one of the original authors failed to complete their chapter. This led to production of in the second edition which included Volume III or “Fractures in Children,” which I edited with Dr. Richard King.

I especially like trauma care because children recover so rapidly and they have only one goal…to return to their relatively care free childhood. I enjoy the breadth that trauma brings; in addition to the challenges of acute trau-
ma; the reconstruction and salvage of trauma complications is very fulfilling. Regardless of the specialty one chooses in orthopaedics; in order to be a successful one must have a genuine interest in helping patients deal with their disabilities be they either temporary or of long term. The monetary rewards should be secondary. This means that they should accept all patients that need their services regardless of their financial status! This is especially true when it comes to the treatment of patients with the public funding such as CHIPS and Medicaid. In most cases, our medical education was subsidized by public funding. As a result, I feel that we have an obligation to take care of all children with trauma conditions respective of their funding.

Do you continue to take trauma call?
Yes, I take trauma call even if it is in the middle of the night. If I am going to be giving lectures on pediatric trauma, I feel it is important that I still be active treating trauma patients.

What are the top five rules that residents should keep in mind when managing pediatric trauma?
1. First, try to assure the parents and children that the condition can usually be rectified.
2. Keep the treatment as simple as possible. It has created a lack of the teaching of non-operative skills in treating fractures in the pediatric age group. I am distressed that our residents are not learning the non-operative management of fractures in children.

My motto is to “leave skills not scars.” My efforts have been directed towards providing continuing education to our orthopedic colleagues in these countries with limited resources.

How has surgical management of pediatric trauma evolved?
When I was in training as a resident and during my early career as a pediatric orthopedist, we all followed the Dictum of Dr. Walter Blount who wrote in 1955 that “Operating on a child with a fracture was the sign of an impetuous surgeon.” Thus the rule was that all fractures in children should be treated non-operatively.

With the advent of C-arm, internal fixation in children could be achieved with less invasive procedures. It has taken a while for many of the older orthopedic surgeons to accept the fact that it is best to manage some fractures in children surgically. Unfortunately with improved operative skills, there is a lack of the development of non-operative skills. This trend to now manage pediatric fractures operatively has created a lack of the teaching of the non-operative skills in treating fractures in the pediatric age group. I am distressed that our residents are not

3. Be sensitive to the need for proper pain relief.
4. Communicate frequently with the child and family during the treatment process.
5. Provide good follow-up.

In addition to trauma, you are also well known for your forays into third world countries to provide service and education.

This is a good place to mention the best way describe other countries. With the end of the cold war, here is no longer a Third World. Many countries resent being called a developing nation as they may consider that they are developed. The politically correct term to describe these nations is “Countries with Limited Resources.”

When did you first start to provide orthopaedic care in underserved regions?
About 15 years ago I started to go to Haiti. At that time my commitment to my sons and my local practice had been pretty well resolved and thus I felt it was time to give back. I had learned of Hopital St. Croix in Leogane, Haiti. I simply went on my own to see if I could provide any service to that hospital. My goal was to establish contacts and provide teaching conferences. I wanted to find individuals who could come to the US to participate in short term observer ships or even attend some conferences in North America. The Haitians are besieged with numerous visitors who have great plans for projects but never follow through. It took a number of trips to establish that I was sincere to be there for the long run.

One thing that became evident early was that there were no post-graduate continuing education activities. Thus, we organized a continuing education course on pediatric trauma. That course was very successful as there was faculty from the US, Canada, Cuba, France and of course Haiti. That course was so successful that it was repeated two years later.

Do you have any current projects in countries with limited resources?
I have recently become very interested in developing a country wide clubfoot treatment program in Haiti. This is a program in which we teach technicians the work in the various pediatric rehabilitation centers how to apply the casts using the Ponseti method. The technicians take great pride in developing their skill of applying the casts.

Is it better to do missions to serve or to educate?
My motto is to “leave skills not scars.” My efforts have been directed towards providing continuing education to our orthopedic colleagues in these countries with limited resources. As a result of the success of being able to provide continuing education using the protocol we established with our courses in Haiti, POSNA members have been able to do the same in other “countries with limited resources.”

Continued on page 4
Pediatric Orthopaedic Profile:
Dr. Kay Wilkins, DVM, MD, continued

To date the Committee on Pediatrics in Underserved Regions (COUR) has conducted 30 Outreach Continuing Education Courses in 26 Countries. This has become permanent activity of that committee.

What is the history of POSNA’s COUR committee and how has it changed over the years?
The COUR Committee was established by Dr. Hugh Watts probably 20-25 years ago. COUR has been the driving force in organizing Continuing Education Courses in countries with limited resources. It was instrumental in developing a cooperative agreement with European Pediatric Orthopaedic Society to organize continuing education courses in many of the countries in and around Europe. These cooperative courses have been extended to working with the Pediatric Orthopedic Society of India, and the pediatric section of the ASEAN (Association of South East Asian Nations). It is now responsible for bringing pediatric orthopedic surgeons on scholarships to both the POSNA and IPOS meetings.

Tips to remember when planning a trip to an underserved area.
1. Always keep your passport on your person at all times. Make a copy of the first page and put in other locations with your personal items.
2. Keep you money in at least there secure places. Be sure to bring a lot of small bills such ones and fives. You will need them for tips.
3. Plan at least to allow two months to get your immunizations completed. Take a water bottle that has a microphone filter. That way you can simply get the water from the central water supply. Bring an anti-diarrheal and a GI antibiotic.
4. Bring a cell phone that works outside the US. Get the SIM card for that country when you arrive at the airport. The SIM card will provide one with a local phone number. These cell phones are the cheapest way to call back to the US.
5. Always have the appropriate converter for electrical appliances
6. Have available a portable light source such as a flashlight. It is best to have a supply of rechargeable batteries or I have found the one that is rechargeable by using a windup is especially useful.
7. Consider a spare generator unit for recharging a laptop computer. I was at a conference where that unit shorted out for one of the speakers.
8. Bring a supply of power bars to use when food is unavailable.

IPOS 2010
By: Jack Flynn, MD

Mark your calendars to join us for The International Pediatric Orthopedic Symposium, taking place at a new location: The Swan Resort in Orlando, Florida December 1-4, 2010. This year we will have a special focus on complex adolescent hip (International Guest Faculty, Reinhold Ganz), managing complications in pediatric orthopedics, limb deformity surgery (International Guest Faculty, Franz Grill), pediatric sports surgery (including hip arthroscopy) and decision-making and surgical techniques for ambulatory children with cerebral palsy (International Guest Faculty, Kerr Graham).

In addition to didactic sessions and panel case discussions, the IPOS Main Sessions will include some novel educational approaches. In order to explore solutions for some of the most vexing pediatric surgical complications, we have a morning set aside when 10 difficult complications are presented to different expert panels, who will debate the optimal management. We will explore complications such as re-dislocation after DDH open reduction, infection after spinal fusion, knee stiffness after tibia eminence fixation, and knee subluxation during limb lengthening. Also new this year, we will have 2 different “Journal Clubs”, in which we explore the evidence regarding the role of Botox and hip surgery for CP hip subluxation and the evidence for managing first time teen shoulder dislocation.

Outside of the Main sessions, IPOS emphasizes hands-on workshops

Continued on next page
The Pediatric Orthopaedic Fellowship Match: Recap of the 2010 Match and Update on the 2011 Match
By: Scott J. Luhmann, MD & Peter Waters, MD

Starting last September a new era for pediatric orthopaedic fellowships began, the old system of multiple applications, interview inequity and “exploding offers” came to an end, and a fair, equitable Match process began. POSNA enlisted the assistance of the San Francisco Match Program (SFMP) to organize and administer the match process, the first of which was completed last April.

This year’s pediatric orthopaedic fellowship Match was a resounding success from the applicant and the fellowship program’s perspective. This year’s applicant class was the largest ever, and follows several years of gradually increasing numbers of residents going into pediatric orthopaedic fellowships. A total of 58 applicants submitted rank lists to SFMP for 59 positions at the 36 registered North American fellowship programs; 47 applicants were matched. The remaining 11 applicants (2 North American and 9 international) are in process to secure a fellowship position.

A survey of fellowship applicants reported the mean number of applications submitted to fellowship programs was 11 with a mean 5 interviews per applicant. 100% of the applicants reported there was no direct pressure to make a commitment prior to the Match Day. In response to the survey information the fellowship directors voted to extend the interview process to begin at an earlier date (November 15th). This will permit interviews to be conducted at the IPOS and AAOS meetings and allow interviews to be spread out over a greater time period. Ideally this will create less scheduling problems in residency programs with a lower financial burden. Applicants are encouraged to arrange formal visits to the fellowship program site and to view the IPOS and AAOS meetings as an “informal” opportunity to meet fellowship directors who attend the meeting.

The 2011 Match for fellowship positions starting 2012, starts September 1, 2010 with the uniform application becoming available on the San Francisco Match Program’s website (www.sfmatch.org). The goal is to have all applications into the SFMP by October 1st to optimize interview scheduling. The SFMP will send out the application form (and supporting documents) to all programs the applicant lists on the website. Interviews will be conducted from November 15th through March 31st. Match lists from the applicants and the fellowship programs are due on Thursday, April 14th and then approximately 1 week later (Thursday, April 21st) the match process will occur. Applicants will be notified by the SFMP as to their assigned pediatric fellowship on Friday, April 22nd. Immediately after the match notification applicants who do not match will be able to use the SFMP website to identify fellowships which did not fill and they can also contact the POSNA main office (847-698-1692) as necessary to get assistance.
Reflections from an Orthopaedic Resident in Haiti: Adrienne Socci, MD
By: Brian Smith, MD

Across the devastated land, countless volunteers labored to help the victims of the January 12 earthquake that rocked southern Haiti. One such volunteer was Dr. Socci a third year resident from Yale; The POSNA Resident Review asked her to share in a portion of her experiences….

“…it has been seven weeks since the earthquake, a Land Rover pulls up with 7 or 8 people in back. Crutches hit the ground as the passengers disembark; empty sleeves and pant legs drift in the wind. One man with an impossibly high above knee amputation makes his way up the stairs faster than all the rest. Smiles and greetings abound as patients come out to meet them. Together they make their way into the church that is now a hospital overflow ward. Victims are found lying on mattresses with ex-fixes and casts, looking on with family surrounding them. Inside, the arrivals join the queue awaiting a team of prosthetists. Some will be fitted today; others are hoping to walk for the first time since the latest of Haitian tragedies.

I had heard about how devastating an amputation was in the Haitian culture. This social stigma, whether it was assumed, perceived, or real, was not apparent that day. Perhaps, in this overwhelming sea of suffering, prejudice has yielded in the face of understanding and opportunity. As patients stood up on their new leg(s), the boisterous crowd, made up equally of patients, staff, and community members, cheered them on. With trepidation they walked with smiles no one had seen for many weeks. Perhaps the storied cultural bias against amputees was more situational. There was no prosthetics in Haiti before; thus an amputation was a societal burden and a personal end of story. For these young men and women, the future was coming back into focus. One of the prosthetists himself had an artificial leg from his own AKA – he wore shorts that day, intentionally stunning the crowd with his effortless motion through the room.

An overwhelming need for orthopaedic care in Haiti had been present the day before the earthquake, and was taken to a horrifying degree when the ground opened up. The response of emergency medical professionals was impressive, as the airport could not accept all the planes that wanted to land. There is an urge to feel like savior, swooping in to save the day. But in these settings where desperate need could often accurately be called acute-on-chronic, you meet amazing people – doctors and nurses and community health workers who had been saving the day long before you ever showed up.

I found myself helping some first time volunteers through some of the subtle challenges of this sort of mission. I have done this work before and found one of the most difficult is balancing what you imagine you are going to do with what actually needs to be done. Humility is something that orthopaedic residents are familiar with, and this is even more important in the developing world. As volunteers, we became humbled guests in the hospital which were manned by Haitian staff who worked as hard as we did. They toiled, perhaps after losing a family member and definitely after losing friends in the earthquake. Their road has no end, ours lasted a week with a comfortable escape home.

7 weeks after the earthquake, we spent our days rounding on 60-80 patients, changing dressings, moving stiff joints. The usual frequency of acute patients continued to come to the hospital – a hip fracture, ankle fracture, a distal radius, a septic knee, osteomyelitis – and we dealt with these as well as we could with equipment that was not always what we were used to. With limited time to stay and sometimes limited ability to communicate with the patients, it was a privilege to bear witness to patients whose lives and stories and wounds we knew well, and who would stand up and walk for the first time on new legs….”

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After the disaster in Haiti, many physicians answered the call to provide medical care to the scores of injured citizens of that impoverished country. Of the estimated 300,000 injured Haitians, it is estimated that up to 35% of those were children of which many had shattered limbs. Inspired by the need for experienced orthopedists to provide care to children, many pediatric orthopedists from around the world responded by providing their expertise in less than auspicious settings. Dr Michael Vitale, Associate Chief of the Division of Pediatric Orthopaedics and Chief of the Pediatric Spine and Scoliosis Service at Morgan Stanley Children’s Hospital of New York was one such physician, and he shared his experiences with us.

Tell me about your background. What led you to pediatric orthopedics?

I did my residency at Columbia, where I initially became interested in Pediatric Orthopaedics because of the diverse nature of the field and the ability to make a difference in the lives of children. I was offered and accepted a position on staff at Columbia before I left for my Fellowship with Vern Tolo at the Children’s Hospital of Los Angeles. I have continued to experience the satisfaction of providing orthopedic care to children.

What made you decide to go to Haiti?

I was down in Miami participating in a spine surgery course when I was called by my partner, Joshua Hyman. It was a few days after the earthquake, and he was arriving in Miami to join a University of Miami Medishare group leaving for Port au Prince. Given the extreme need for physicians to care for the large number of injured children, I felt compelled to help. I was able to arrange coverage for my practice and I returned to New York, gathered supplies, connected with another group and was on my way to Santo Domingo 3 days later.

What was your first impression of the situation in Haiti?

I was unprepared for the amount of chaos, the enormity of the need and the level of poverty. We did a lot of surgery but we soon ran out of supplies. People were appearing from all over, but there was no real order, and everyone was trying to figure out where to go, and how to get supplies.

What was the most rewarding part of your experience?

The most rewarding thing was the pure satisfaction of being able to provide care to needy patients without administrative headaches of bureaucracy. It is a purity that we are losing in our health care system. I was very fortunate to find the Love a Child Disaster Recovery Center where my ad hoc team spent the rest of our time. It was an impressive place where the Humanitarian Health Initiative was quickly developing order. It is now the largest sub acute hospital in Haiti, still doing lots of good work.

What are some lessons you learned from your experience?

As pediatric orthopedists, we have a unique ability to provide care for children in all settings. In addition to high-tech complex treatments, we have experience with low tech, nonoperative care of fractures, which is an invaluable skill in these settings. Using basic tools (external fixator, Black and Decker Drill) we were able to rapidly stabilize patients and allow further definitive care to occur later. We learned that the military is invaluable as a source to provide security, logistical support and organizational expertise. Getting involved with respected organizations with significant experience with humanitarian aid allows you to provide care in an efficient manner. Most importantly, I learned how much good a small, dedicated group can do in a short time span if they work together for the benefit of their patients.

Continued on page 8
Profile in Haiti, Dr. Michael Vitale, continued

Do you plan to continue with overseas work?
I’ll definitely do more work abroad. In fact, I have plans to go to Peru in November with Orthopaedics Overseas, and greatly look forward to getting more involved with International work in the future. There are lots of ways to contribute; as pediatric orthopaedic surgeons, we are fortunate to have a skill set that we can leverage to make a difference.

POSNA Job Site Announcement

This secure, password protected site was designed to match practicing pediatric orthopaedic surgeons and pediatric orthopaedic fellows with their ideal pediatric orthopaedic surgery jobs. Importantly, it continues in keeping with our mission of “the highest quality education of pediatric orthopaedists thereby assuring the best possible care of musculoskeletal pediatric patients.”

JOB SEARCHERS – can search efficiently and free of charge using their POSNA identification number or AAOS ID number. Job seekers can search all jobs or tailor the search by state, percentage of time focused in pediatric orthopaedics, or subspecialty areas of interest. Search for jobs now. http://www.posna.org/member/profile/login.cfm?appl_code=FINDJOBS

EMPLOYERS – can effectively reach their audience and advertise pediatric orthopaedic surgery positions including information on percent time in pediatric orthopaedics, and subspecialty focus if desired. The cost to post a job is $200 for 6 months. Payment can be made securely online. Postings automatically expire in 6 months with friendly monthly contact from the POSNA office. Post your job notice now. https://www4.aaos.org/spec/posna/timssnet/placement/tni_practice_login.cfm?appl_code=PRAC_SUB

If you need more information, you may want to contact Bryan Tompkins, Internet Committee Chair: bryan@collectivemed.com or Cristina Cabral at the POSNA office: (847) 698-1692 or cabral@aaos.org.

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Challenging Cases: What Would You Do?  
*continued from page one*

**CASE #2**

A 13 old girl presents with a painful bunion deformity (Figure 2) that has been refractory to nonoperative measures. Surgical management should include:

A. Distal soft tissue release/capsulorrhaphy  
B. Distal first metatarsal osteotomy  
C. Distal soft tissue release/capsulorrhaphy and proximal osteotomy  
D. Proximal hemiepiphysiodesis  
E. Metatarsal-phalangeal fusion

*Your Response: ___*

**CASE #3**

A 12 year old soccer player complains about bilateral heel pain after games. He denies pain at rest. Squeezing the calcaneus reproduces his pain. His Achilles tendons are tight on physical exam. Optimal management should include:

A. MRI to evaluate for calcaneal osteomyelitis  
B. Tendoachilles Lengthening  
C. Gastrocnemius Lengthening  
D. Achilles stretching, ice, heel cups  
E. Immediate cast immobilization

*Your Response: ___*

**Discussion**

Sever’s disease, or calcaneal apophysitis, is a common affliction in the adolescent population. Pain is often described after running activities. A common finding is a tight Achilles tendon which may increase the stress on the apophysis. Treatment is directed toward Achilles flexibility, anti-inflammatory and ice, and perhaps gel heel cups. Casting may be indicated when initial treatment fails. While calcaneal osteomyelitis has been described, this patient has bilateral involvement. Surgical lengthening of the Achilles or gastrocnemius is rarely required. While rest is helpful, relief of minor symptoms can often be obtained without completely withdrawing from sports.

The correct answer is D.

**References**

When using the Ponseti technique to treat congenital clubfoot, what is the initial treatment for an early recurrence (<12 months of age) of deformity?

A. Achilles tenotomy  
B. Posteromedial release  
C. Repeat manipulation and application of casts  
D. Abduction orthosis  
E. Tibialis anterior tendon transfer  

Your Response: ___
Challenging Cases: What Would You Do?

continued from previous page

CASE #6, continued

References

CASE #7

A two week old male presents with a left foot deformity. Examination reveals excessive dorsiflexion of the ankle and plantarflexion to neutral, the calcaneus is normally positioned in the heel. The child demonstrates normal motor function when the foot is stimulated. Clinical photos demonstrate the position of the foot (Figure 7). The treatment predicted for complete resolution is:

A. Prolonged bracing due to triceps surae weakness
B. Manipulation and casting
C. Isolated lengthening of foot dorsiflexors
D. Posterolateral release with lengthening of the anterior tibialis
E. Observation

Your Response: ___

Discussion
Calcaneal-valgus foot deformity occurs in approximately 1 in 1000 live births. The hindfoot is externally rotated and dorsiflexed at the ankle and the dorsum of the foot can come in contact with the anterior tibia. This condition can be seen in isolation or with posteromedial bowing of the tibia. In posterior medial bowing the apex of the deformity is at the distal tibia. Here the child’s tibia is straight. A similar foot appearance can be seen in congenital vertical talus where the calcaneus is elevated in the heel from tight posterior muscles, or in patients with paralysis of the triceps surae (spina bifida). These disorders are ruled out in this patient who has normal neurological exam and calcaneal pitch. For this boy, stretching of the foot into plantarflexion and inversion can be suggested but the majority resolve spontaneously by 3-6 months of age.

The correct answer is E.

References

CASE #8

A 12 year old female soccer player presents to clinic complaining of pain and tenderness over a large prominence on the medial side of the foot. On exam she has a planovalgus foot and a tight gastrocnemius muscle. Radiographs are shown in Figure 8. The best surgical procedure for this patient is:

A. Lateral column lengthening with Achilles tenotomy
B. Subtalar fusion
C. Excision of sub-talar coalition
D. Osteosynthesis of navicular stress fracture
E. Excision of the prominence

Your Response: ___

Discussion
This child has an accessory navicular shown best on the oblique of the foot. Non-operative methods which include orthotic management can decrease the pain and may avoid the need for future surgery. Surgery for this condition includes excision of the accessory navicular through the synchondrosis and possibly removing a portion of the prominent medial native navicular. Other surgical methods above are useful for recalcitrant coalitions, flexible flatfeet or arthrosis. Attempts to fuse the synchondrosis are not indicated.

The correct answer is E.

References
Noonan, KJ. The foot and lower extremity. Orthopaedic Knowledge Update 9, AAOS Publication. 2008
A 14 year old boy with a long history of painless flatfeet presents to your clinic. His mother has flatfeet which are occasionally painful. Which of the following statements is true?

A. His foot should have been treated with an arch support as a child
B. He should be tested for hereditary Charcot Marie Tooth
C. He should be scheduled for subtalar CT scan.
D. Treatment should be based on symptoms.
E. Orthotic treatment will definitely avoid future problems

Your Response: ___

Discussion
Flatfeet are commonly seen and are not usually related to heritable neurological conditions such as CMT, these patients usually present with cavus feet. Evaluation of his foot with a CT scan might be indicated if treatment for a painful flatfoot is considered, such a test can evaluate for tarsal coalition. Orthotic use in asymptomatic feet will not prevent future problems regardless of age.

The correct answer is D.

References
Noonan, KJ. The foot and lower extremity. Orthopaedic Knowledge Update 9. AAOS Publication. 2008

CASE #10, continued

and 3 lesions are treated initially non-surgically with a weight bearing cast or cam-walker as well as activity restriction. Although patients will be asymptomatic after this treatment, there are a significant number of patients who will continue to present with persistent lesions on radiographs. These patients are generally observed on a yearly basis. Patients with persistent pain or stage 4 lesions are candidates for arthroscopic evaluation and either surgical drilling, debridement or fixation followed by non-weight bearing for at least 3 weeks. It has been shown that in skeletally immature patients, OCDT lesions usually respond to non-operative treatment, which include activity modification and suspension of sports.

The correct answer is D.

References

CASE #11

A 5 week old baby boy is seen with a rigid planovalgus deformity of both feet; the clinical and radiographic appearance is shown in Figures 11. The pathology includes:

A. Congenital fusion of the subtalar joint
B. Fixed dorsal dislocation of the navicular on the talar head and neck
C. Congenital absence of one or more of the midfoot bones
D. Posterior tibia tendon dysfunction
E. Posteromedial tibia bowing

Your Response: ___

Discussion
The condition known as Congenital Vertical Talus (CVT) is an uncommon foot deformity characterized by fixed dorsal dislocation of the navicular on the talar head and neck; in addition a significant posterior contracture is present. Its incidence is estimated to be 1/10000 and is associated with neuromuscular or genetic disorders in about half of the cases. Diagnosis is confirmed on a forced plantar flexion lateral radiograph in which the talus remains vertical and...
CASE #11, continued

A 10-year-old girl has a two-month history of foot pain, especially when running. Examination reveals localized pain and minimal swelling localized to the distal second metatarsal. Metatarsal-phalangeal joint range of motion is limited. Her X-rays and MRI are shown in Figure 12.

Initial management should include:

A. Obtain laboratory studies to rule out infection
B. Excision of the second metatarsal-phalangeal joint with interposition arthroplasty
C. Arrange for urgent biopsy
D. Dorsal closing wedge osteotomy of the distal second metatarsal
E. Limited weight bearing with crutches, orthotics, and shoe modifications

Your Response: ___

CASE #12

A 10-year-old girl has a two-month history of foot pain, especially when running. Examination reveals localized pain and minimal swelling localized to the distal second metatarsal. Metatarsal-phalangeal joint range of motion is limited. Her X-rays and MRI are shown in Figure 12.

Initial management should include:

A. Obtain laboratory studies to rule out infection
B. Excision of the second metatarsal-phalangeal joint with interposition arthroplasty
C. Arrange for urgent biopsy
D. Dorsal closing wedge osteotomy of the distal second metatarsal
E. Limited weight bearing with crutches, orthotics, and shoe modifications

Your Response: ___

The correct answer is B.

References

Discussion
The patient’s history, physical exam, and imaging studies are consistent with Freiberg’s infraction or disease. This osteochondrosis of the metatarsal head typically presents in adolescence and has a 5:1 female preponderance. The second (usually longest) metatarsal is most frequently affected. The etiology is not fully understood; however, trauma and vascular compromise are the most popular theories. Various classification schemes exist which correlate physical and radiographic findings with treatment options. Initial stages

Continued on page 14
CASE #12, continued

include early fracture of the subchondral epiphysis followed by collapse of the dorsal central portion of the metatarsal head with flattening of the articular surface. Later stages include increased collapse of the central metatarsal head resulting in medial and lateral projections which can fracture off and result in loose bodies. End-stage arthrosis can occur with marked collapse and flattening of the metatarsal head and joint space narrowing. A trial of conservative treatment including protective weight-bearing, casting, orthotics, and shoe modifications is recommended, especially in young patients in early stages (as in the case example). For those who fail non-operative treatment, a variety of surgeries have been described including: joint debridement, metatarsal head excision (which may result in unsightly shortening of the toe), metatarsal dorsiflexion osteotomies (which rotate healthier plantar cartilage into the joint), and even joint replacement for severe cases.

The correct answer is E.

References

CASE #13

A 5-year-old boy from India presents with the complaint of foot pain and limp that increases with activity and decreases with rest. Exam reveals a well-appearing child with minimal swelling and faint erythema and warmth along the dorsal-medial midfoot. Palpation reveals tenderness in the region of the tarsal navicular. X-rays are shown in Figure 13. The next most appropriate step is to:

A. Obtain a bone scan
B. Arrange for biopsy
C. Place him in a short-leg walking cast for 8 weeks
D. Place a PPD test
E. Obtain labs to rule out infection

Your Response: ___

Discussion
The patient’s history, physical exam, and radiographs are consistent with the diagnosis of Kohler’s Disease, or osteochondrosis of the tarsal navicular. This condition typically presents between the ages of 2 to 9 years and is characterized by sclerosis, fragmentation, and flattening of the navicular. Bone restoration occurs in 6 to 16 months. Although imaging such as MRI or bone scan can reveal changes consistent with altered blood flow to the navicular prior to changes seen on plain radiographs, these additional studies are unlikely to alter diagnosis. Invasive procedures are unnecessary. Kohler’s disease is usually self-limited with no long term problems. In the early painful phase, activity modifications may be useful. Casting has been shown to decrease the duration of symptoms from an average of 10 months down to 3 months.

The correct answer is C.

References

CASE #14

The recommended treatment for a painful toe deformity in a three year old seen in Figure 14 is:
A. Splinting.
B. Flexor tenotomy.
C. Flexor-to-extensor transfer.
D. Syndactylization to the adjacent toe.
E. Proximal interphalangeal joint arthrodesis.

Your Response: ___

Discussion
Congenital curly toe is secondary to congenitally short or tight flexor digitorum longus or brevis muscles. Initially, there is no capsular contraction. The condition is often familial, bilateral, and symmetrical. It is usually asymptomatic at first, but corns and calluses can develop if the toes become stiff. Splinting has not been found to be effective. Proximal interphalangeal joint arthrodesis is reserved for cases in older children and adolescents in whom a fixed deformity
Challenging Cases: What Would You Do?
continued from previous page

CASE #14, continued

Discussion
Metatarsus adductus can be quantified based on where a heel bisector hits the toes. If it hits the third toe the metatarsus is considered mild, the fourth toe is moderate, and the fifth toe severe. Qualitatively, metatarsus adductus is actively correctable if tickling the lateral border of the child’s foot causes him/her to straighten the foot in response, it is passively correctable if gentle stretching will straighten the foot, and rigid if the foot does not correct with manipulation. Metatarsus adductus is a component of clubfoot but this child does not have cavus or equinus deformity.

The correct answer is B.

References

CASE #15, continued

Discussion
Metatarsus adductus can be quantified based on where a heel bisector hits the toes. If it hits the third toe the metatarsus is considered mild, the fourth toe is moderate, and the fifth toe severe. Qualitatively, metatarsus adductus is actively correctable if tickling the lateral border of the child’s foot causes him/her to straighten the foot in response, it is passively correctable if gentle stretching will straighten the foot, and rigid if the foot does not correct with manipulation. Metatarsus adductus is a component of clubfoot but this child does not have cavus or equinus deformity.

The correct answer is B.

References

CASE #15

Based on Figure 15, the foot shown on the right (the infants left) would be classified as:
A. Calcaneal valgus foot
B. Moderate metatarsus adductus.
C. Severe metatarsus adductus.
D. Mild clubfoot
E. Postural (positional) clubfoot

Your Response: ___

CASE #16

Figure 16 below demonstrates a foot deformity in a young child. All of the following are false except:
A. This is an example of pre-axial polydactyly which is more common.
B. This is an example of post-axial polydactyly which is more common.
C. Typically the patient is treated with ray resection
D. Most polydactyly can be inherited as an autosomal recessive trait.
E. Polydactyly may present as poly-syndactyly

Your Response: ___

Continued on next page
CASE #16, continued

Discussion
Polydactyly is the most common congenital toe deformity, occurs in about 1 in 1000 births and most frequently involves the lateral side of the foot (Post-Axial). This is a Pre-Axial polydactyly and is much less common. Typically inherited as an autosomal dominant trait, it may be simple in the form of a rudimentary toe or more complex with fusion of the bony elements or polysyndactyly. Usually the border digit is resected as it is the most rudimentary in function and the procedure is fairly simple. Ray resection or resection of the more medial digit is performed if it is clearly the less developed digit.

The correct answer is E.

References

CASE #17, continued

disease also now known as Hereditary Sensory Motor Neuropathy. The characteristic deformity in Congenital Vertical Talus is the so-called Rocker Bottom Foot in which the plantar flexed talus produces fullness in the arch. All of the other disorders mentioned above can cause unilateral or bilateral cavus feet. In general, the presence of a cavus or varus foot demands consideration for a neurological work-up.

The correct answer is D.

References

CASE #17

Figure 17 represents a foot deformity that could be seen in all of the following disorders except:
A. Muscular dystrophy
B. Chiari malformation
C. Charcot Marie Tooth disease
D. Congenital vertical talus
E. Freidreich ataxia

Your Response: ___

Discussion
Whether unilateral or bilateral, the elevation of the medial longitudinal arch or Cavus foot is often a manifestation of another disorder or condition. Typically intrinsic muscles are atrophied and the muscle imbalance produces the foot deformity. Many patients will have concurrent hind foot varus. Clawing of the toes as seen here is often seen concurrently. The classic cause of a cavo-varus foot is Charcot-Marie-Tooth

Your Response: ___

CASE #18

The toe deformity shown in Figure 18 is symptomatic with shoe wear and shoe modifications. Surgical correction would consist of:
A. Flexor digitorum longus tenotomy
B. Extensor digitorum tenotomy
C. 5th MTP joint fusion
D. Syndactylization of the 4th and 5th toes
E. Capsular release, extensor lengthening and pinning

Your Response: ___

Discussion
This child has a congenitally overriding 5th toe and can be seen as an isolated condition. Pathologically the proximal phalanx is displaced on the fifth metatarsal head. Surgery consists of capsular release and reduction of the MTP joint and pinning. The extensor tendon and the dorsal capsule usually requires a Z-lengthening.

The correct answer is E.

References
CASE #19

A 15 year old boy with bilateral and symmetric foot deformities is sent to you by his pediatrician who wants to know if he can play high school football. He is currently asymptomatic but his foot is examined and his gastrocnemius is tight. Clinical photos and radiographs are shown. (Figure 19). The diagnosis and treatment of this condition is:

A. Serpentine foot that requires a calcaneal lengthening
B. Zed-foot that is best managed with first cuneiform osteotomy
C. Metatarsus adductus treated with Tendoachilles lengthening
D. Skew foot treated with observation
E. Adolescent bunion treated with proximal osteotomy and soft tissue balancing

Your Response: ___

CASE #19, continued

Discussion
This boy has a foot deformity commonly called Skewfoot, Zed-Foot, Z-foot or Serpentine foot. Anatomically he has forefoot adduction (Metatarsus Adductus) on the midfoot and valgus midfoot displacement on the hindfoot. Additionally he does have a bunion deformity. Surgical correction could consist of calcaneal lengthening, midfoot osteotomy, forefoot osteotomy and/or gastrocnemius lengthening. However he is asymptomatic and he should not undergo any surgical treatment.

The correct answer is D.

References