

ADVANCES IN ORTHOPEDICS



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INSIDE THIS ISSUE

2 Advancing Care for Foot and Ankle Disorders

3 Expanding Expertise in Orthopedic Oncology

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Protocol-Based Management of Geriatric Hip Fracture

NewYork-Presbyterian is poised to establish a standardized protocol in the management of hip fracture in the elderly. Led by the Department of Orthopedics at NewYork-Presbyterian/Columbia University Medical Center, a multidisciplinary team with representatives from orthopedics, anesthesiology, geriatrics, nursing, physical therapy, and social work is convening monthly to develop best practices that can be implemented throughout the institution.

"Hip fractures increase exponentially as we age," says **R. Kumar Kadiyala, MD, PhD**, a Columbia orthopedic surgeon with expertise in trauma and hand/upper extremity surgery and a member of the reviewing team. "By and large, fragility fractures in individuals in their 70s and 80s are almost always associated with some degree of osteoporosis or poor bone health. And as they age they have more comorbid medical problems and likely to have a cardiac, neurologic, or pulmonary issue."

"Making sure elderly patients are as healthy as they can be before hip fracture surgery entails a rapid and thorough medical assessment, without prolonged medical testing that in the long run won't change the patient's outcome."

— **Dr. R. Kumar Kadiyala**

Dr. Kadiyala likens the process of standardizing protocols for hip fracture to those developed for stroke management where time is of the essence. "With hip fracture, we believe certain treatments should also be performed within a window of opportunity," he says. "We've documented and studies have shown that hip fractures treated in an expeditious manner have better, overall outcomes for patients. To that end, one recommendation will be to expedite surgery within 24 to 48 hours of presentation."

H. John Cooper, MD, a specialist in adult reconstructive orthopedic surgery with a focus on primary and revision hip and knee arthroplasty, is also a member of the team developing the hip



Dr. H. John Cooper and Dr. R. Kumar Kadiyala

fracture protocol. "Elderly patients frequently come in with multiple comorbidities," says Dr. Cooper. "They require a higher level of care than a healthy patient having an elective surgery. Surgical timing, anesthesia technique, surgical approach, and early mobilization are all very important. Minimizing medications that put them at risk for delirium is critical. We have a short window to medically optimize these patients and bring them to the operating room so that we can get them mobile as soon as possible and prevent complications."

"Most patients with displaced femoral neck fractures are best managed with hip arthroplasty," continues Dr. Cooper. "We apply the latest guidelines for best practice treatment, utilizing anterior approach hip surgery that minimizes soft tissue damage and allows these patients to become mobile more quickly. It is a muscle-sparing approach that results in less pain and narcotic requirement post-operatively. We then integrate these patients into a multidisciplinary follow-up protocol."

Dr. Cooper has looked specifically at the variability of choices of how patients with hip fractures are treated across multiple institutions. "Do those

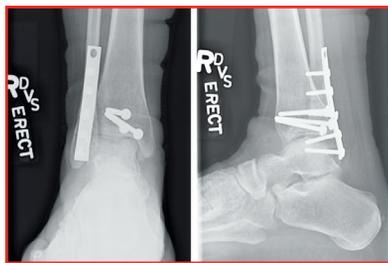
(continued on page 4)

Advancing Care for Foot and Ankle Disorders

When **Justin K. Greisberg, MD**, Chief of the Foot and Ankle Service, joined the Department of Orthopedics at NewYork-Presbyterian/Columbia University Medical Center in 2002, he had been tapped to redevelop the service, which although having had a rich history at the Hospital, had not had dedicated orthopedic surgeons in the subspecialty for several years. In 2011, **J. Turner Vosseller, MD**, joined Dr. Greisberg, and today their combined clinical, research, and education expertise and pioneering work in complex reconstructive surgeries and orthopedic trauma is benefitting patients and the subspecialty alike. This article focuses on their work in two particularly challenging clinical scenarios: the posterior pilon fracture and determining return to play following an ankle injury in professional athletes.

Posterior Pilon Fracture: An Alternate Approach to an Age-Old Challenge

For many years, orthopedic surgeons have approached posterior pilon fractures from either the side or from the front. The latter technique involves making a long medial incision and dislocating the ankle in order to reach and then reduce the fracture. It also requires extensive soft tissue stripping of fracture fragments. “It was a good way to deal with the fracture pattern, but it was quite invasive,” says Dr. Greisberg. “Today, we try not to be so aggressive in our dissections.”

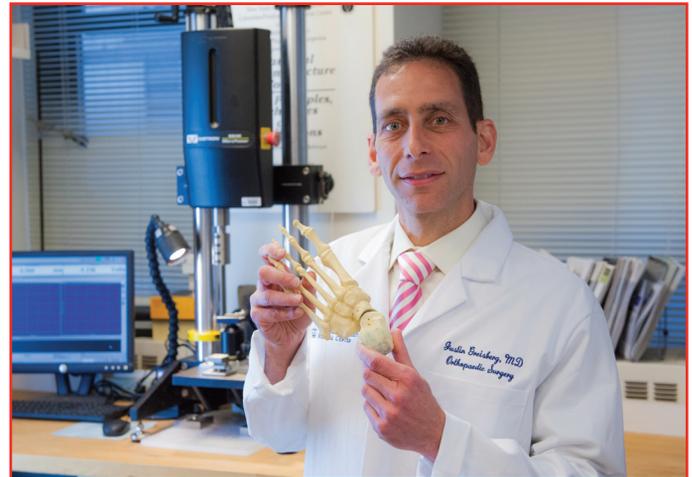


Postoperative films after surgical fixation of a posterior pilon fracture. The fibula is reduced and plated after the tibia through the same posterolateral incision.

Recognizing that standard anterior, medial, or lateral surgical approaches to the ankle provided poor visualization and limited access to the posterior plafond, Dr. Greisberg looked for an alternate way that would produce better functional outcomes. “I had approached the area from the lateral side, I tried it from the medial side. It’s really difficult to reach,” says Dr. Greisberg. “From the standard sides, nothing worked well.”

Many years ago, Dr. Greisberg was discussing treatment approaches for this challenging fracture with a trauma surgeon. “He said, ‘why don’t you just go from the back?’ He meant it as a joke, but it actually made sense to me,” says Dr. Greisberg. “So, we started accessing the tibial plafond with a posterolateral approach, which is generally used for tibia fractures located higher up. It had never been described before as being done in the ankle. I didn’t invent the approach, I just refined it for these fractures.”

Dr. Greisberg subsequently undertook a retrospective study of 15 patients with posterior pilon injuries that he had treated with either a posteromedial, posterolateral, or a combined technique between 2002 and 2007. “We looked at any surgical complications and examined their imaging studies for alignment and arthrosis,” notes Dr. Greisberg. “We found the posterior technique to be safe with no subsequent neurovascular injuries or infections. We were



Dr. Justin K. Greisberg

able to directly expose and reduce posterior fragments without the expansive soft tissue stripping and achieved a good reduction in the majority of cases.”

“Since then other surgeons have written similar observations of this approach, which has become more mainstream,” says Dr. Greisberg. “There’s an old expression that the eyes can only see what the mind knows. So, years ago surgeons never thought about using the posterolateral approach to these fractures. Now we use it all the time because we’re able to recognize more and more that many fractures that we thought didn’t need this approach actually do.”

Timing Is Everything: Optimizing Return to Play

Interestingly, despite that determining the optimal time for a professional athlete to return to competition following a foot and ankle injury is possibly the most critical question in sports medicine, few studies have to date provided solid evidence for developing decision-making protocols. “It may seem like a simple question, but how does the team doctor or any physician decide when to tell the patient, ‘you’re ready to go,’” says Dr. Greisberg. “The approach currently is that the trainer, the coach, the athlete, and the physician all weigh in on this decision. And while we may all agree the time is right, it isn’t a scientific process.”

“Through this study, our goal is to establish objective parameters for determining when an ankle that’s injured is ready to be returned to play without excessive risk of reinjury.”

— Dr. Justin K. Greisberg

To address this issue, Drs. Greisberg, Vosseller, and their colleagues are working on one of the first studies to develop criteria for return to play of high level athletes following a foot and ankle injury. He and his team have developed a number of ankle function tests – for example, jumping on one leg – and over the past three years have evaluated 100 collegiate, high-level athletes to identify how a healthy athlete performs. They are now doing the same tests with injured athletes to distinguish how they do over time. “In the

(continued on page 3)

Expanding Expertise in Orthopedic Oncology

In June 2017, the Department of Orthopedics at NewYork-Presbyterian/Columbia University Medical Center welcomed **Wakenda K. Tyler, MD, MPH**, as Chief of the Orthopedic Oncology Service. Dr. Tyler is a musculoskeletal oncologist who specializes in the nonoperative and operative management of primary soft tissue and bone cancers, sarcomas, and metastatic bone cancer in children and adults.

Because of the rarity of primary bone tumors, Dr. Tyler joins the ranks of a limited number of orthopedic oncologists in the country. Bringing a rich educational experience to her new position, she earned her medical degree from The Johns Hopkins University School of Medicine, where she also received a master's degree in public health. She then went on to complete her residency in orthopedic surgery at Hospital for Special Surgery, followed by a fellowship in musculoskeletal oncology at Memorial Sloan Kettering Cancer Center. Prior to coming to NewYork-Presbyterian, Dr. Tyler served as an orthopedic oncologist at the University of Rochester Medical Center.

"Columbia's integrated sarcoma service for cancers of the bone and soft tissues calls on a multidisciplinary approach for the evaluation of each patient," says Dr. Tyler. "We have a fully integrated team system here. I represent the surgical portion of the team, working with **Dr. Gary Schwartz**, who is Chief of Hematology/Oncology at Columbia, as well as the radiation oncologists. We regularly discuss complex cases to decide the best treatment course for each patient and then execute that plan. Sometimes it involves surgery, sometimes we treat with chemotherapy or radiation, and sometimes care involves a combination of all of the above."

"We also pursue targeted therapy for patients who require chemotherapy," says Dr. Tyler. "Dr. Schwartz does genetic testing on malignant tumors and some of the benign tumors. If we can find the genetic abnormality within that tumor it will allow us to target it with some of the newer therapeutic agents being developed. Collecting these gene analyses will enable us to identify specific genes in the future that either allow for a good response or a poor response to therapy and then potentially alter therapy, with greater precision, based on that analysis."

For patients with metastatic disease, Dr. Tyler focuses on keeping the cancer at bay in other parts of the body, while also concentrating on the bone. "We can offer many therapies that target cancers in the lung, liver, and kidney, but when they invade the bone, some of these therapies don't work," she says. "We are currently looking at antiangiogenic and anti-vascular tumor therapies to block tumor angiogenesis in the bone. If we can cut off the blood supply to those tumors, we may inhibit the cancer from being able to grow. We are



Dr. Wakenda K. Tyler

also studying what the bone environment does to these cancer cells to insulate them from the chemotherapies that we're giving. For a variety of reasons, the bone environment allows cancer to grow, rather than allowing the chemotherapy to have the same impact on the cell as it does in other parts of the body."

Dr. Tyler notes that her goal is always to achieve cure by leveraging the latest advances in nonoperative management, as well as minimally invasive and reconstructive surgical techniques. When cure is not possible, she strives to achieve pain control and improve function to the greatest extent possible for each patient. "One of the problems with metastatic disease is that when the therapies start to fail, patients are often in pain," says Dr. Tyler. "We integrate a variety of pain management modalities as well as surgical techniques to treat and control their pain."

Dr. Tyler's research interests overlap with her clinical practice and center on conditions that lead to osteolysis. Her published articles focus on the effectiveness of medication in penetrating the site of bone grafts and strengthening the bone and prosthesis union.

Looking to the future of orthopedic oncology, Dr. Tyler foresees major progress over the next decade in both bone and soft tissue sarcomas and metastatic bone disease in terms of pain control and patient survival. "I have always envisioned my life as one that gives to others, and working in this field allows me to accomplish that wholeheartedly."

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Advancing Care for Foot and Ankle Disorders (continued from page 2)

beginning they can barely do the test, and as they get stronger they do better and better," says Dr. Greisberg.

While the study is now in the data analysis phase, initial findings indicate variability among the athletes in terms of how they perform on the objective tests. "For example," notes Dr. Greisberg, "football players, and sometimes the linebackers, are a little less nimble. Their balancing and dexterity maneuvers are not as good as say a soccer player or a gymnast. Also, because the right and left leg often function fairly symmetrically, we may be able to compare pre-injury baseline data

obtained at the beginning of the season for each leg to data obtained following an injury, rather than using an absolute score to determine return to play. Through this study, our goal is to establish objective parameters for determining when an ankle that's injured is ready to be returned to play without excessive risk of reinjury."

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Protocol-Based Management of Geriatric Hip Fracture (continued from page 1)

choices affect the ultimate outcome in terms of who takes care of these patients, when they are taken care of, what kind of operation is performed, what service they're admitted to, and where they are discharged to? Of all those variables, which of these have the greatest influence on mortality, complication rates, readmission rates, and other outcomes?" Dr. Cooper's study won a research award at the 2017 meeting of the American Association for Hip and Knee Surgeons and will be published in an upcoming issue of *The Journal of Arthroplasty*.

"How we treat elderly patients with hip fracture hasn't really changed that much over the last decade or so, but being able to do the surgery quickly is key," says Dr. Kadiyala. Medical complications for patients following hip fractures can include cognitive neurologic alterations, cardiac or pulmonary issues, blood clots, GI bleeding, urinary tract infection, anemia, and pressure sores. The increased length of stay from these complications then often leads to extended stays in long-term healthcare facilities.

"Unlike patients of a similar age who are planning elective total hip or knee replacement and are relatively healthy, we don't have a chance to optimize the health of acute hip fracture patients preoperatively," says Dr. Kadiyala. "Making sure elderly patients are as healthy as they can be before hip fracture surgery entails a

rapid and thorough medical assessment, without prolonged medical testing that in the long run won't change the patient's outcome."

"Discussing these issues with orthopedic surgeons from other NewYork-Presbyterian campuses, as well as our medical and anesthesia providers, helps us understand each other's perspective and enables us to implement a seamless best practice approach to taking care of these difficult injuries and complex patients and optimize their outcomes," adds Dr. Cooper.

"While we want to apply uniform best practice guidelines at all NewYork-Presbyterian campuses and regional hospitals, we recognize that there will be slight deviations," says Dr. Kadiyala. "But if we can prevent medical complications and avoid prolonged stays in a rehabilitation facility or discharge to a nursing home, everyone benefits."

"The team is also seeking ways to ensure that patients are receiving optimal care when they transition back to their homes," adds Dr. Kadiyala. "Our social workers and care managers stay involved to facilitate their safe recovery."

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