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Orthopaedic Trauma: Healing Bones & Restoring Function

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Medical Breakthroughs from Penn Medicine

Advancing Medicine Through Precision Diagnostics and Novel Therapy

Narrator:

Welcome to **Medical Breakthroughs** from Penn Medicine: Advancing Medicine Through Precision Diagnostics and Novel Therapy.

Dr. McDonough:

Patients of all ages can be affected by a traumatic injury. These injuries can be complex to treat and may involve multiple parts of the body, and in traumatic situations, decisions are made quickly. You're listening to ReachMD, and I'm your host, Dr. Brian McDonough, and with me today is Samir Mehta. Dr. Mehta is Assistant Professor in the Department of Orthopedic Surgery at the Perelman School of Medicine at the University of Pennsylvania. The focus of our discussion is ortho trauma.

First of all, Dr. Mehta, welcome to the program.

Dr. Mehta:

Thanks for having me. I'm really excited.

Dr. McDonough:

It's going to be a lot of fun to talk about this with you, and I guess the first thing is, when you really think about it, fractures are a year-round event. I guess all throughout the year you can have different opportunities, I guess, for fractures. Tell me a little bit about what some of the common mechanisms of injury are and what happens at different times of the year?

Dr. Mehta:

A lot of it depends on your geography. The injuries I might see in Florida or Southern California may differ from the injuries we see here in the Northeast, and so a lot of it is dependent on geography. Typically, in the northeastern states in the summertimes, we see injuries that are higher energy style injuries: motorcycles, bike crashes, injuries that are of the nature of active or activity or active people. In the wintertime, we see a lot more slip and falls, fall from heights. It's not uncommon for people to be hanging their Christmas lights or their holiday lights and breaking their calcaneus or breaking their hip when they slip on the ice, and so the range of injuries really varies based on the geography and activity level of individuals. But one of the things that we have not seen is a variation. Sometimes people say that fractures or injuries are a seasonal event -- people are more active in the summer and so you'll see more injuries in the summer. That's actually not true. If you look at some of the data that's out there, even our own institutional data, we're fairly consistent year round. We change the type of injury that we see, so we go from the severely open tibia fracture and trade that for a heel bone fracture after a fall from a height or a slip and fall ankle fracture that may happen in the spring or the winter as the streets are slick with rain. And so, definitely, there's a variation, but the volume doesn't change.

Dr. McDonough:

That is interesting, because you would think, at least from my perspective, certain times of the year people are out and about, they're doing things, there would be more problems, but you would obviously see the flow as it comes to you. Nobody plans on having an injury. Nobody goes out and says, "Gee, today I'm going to break my leg," or have a problem like that. When we talk about these mechanisms and things that happen, are there certain injuries that certain people, certain age groups, are predisposed to suffer from?

Dr. Mehta:

Nobody gets up in the morning and says, "I'm going to go to the Starbucks and then on my way out of the driveway I'm going to get hit by a car." That's usually not planned. And so, a lot of times there are definitely age groups that have a predilection for certain injury patterns, so the classic ones that we think of are elderly or senior patients and they fall and they'll typically break their hip, they'll break their wrist, they may have some vertebral compression fractures or injuries to their spine. Those are probably... When you talk about a specific patient population, the elderly almost always have those three fracture patterns happening at a fairly consistent clip.

Other injuries that we see, young patients, tibial plateau fractures, which is the top of the tibia, we'll see a fair amount of those, lots of ankle fractures in the young, active population because of the rotational mechanism that you'll see. And again, year round, whether you're skiing or whether you're ice skating or whether you're playing baseball, that rotational torsional mechanism, very common in the younger patient population. Definitely see injuries vary by age group with the geriatric patients really being very consistent with the way they appear.

The other interesting thing that we are seeing now is with the increase in hip and knee replacements, we're seeing a lot more fractures around hip and knee prostheses, again more of an affliction for our senior or older population, but the fracture patterns are fairly consistent, again happening in that older age group, those periprosthetic fractures.

Dr. McDonough:

You know, when you talked about young adults, teenagers, even 10, 11-year-olds, we're seeing a growing number of overuse injuries and problems in that age group perhaps because of the drive for college scholarships and sports and all those things. Has that been something in your career you're seeing increase and become more problematic?

Dr. Mehta:

So, it's fascinating that you say that too, as well, because we are seeing a real increase in injuries in general. If you look at some of the CDC data, the Centers for Disease Control, they'll tell you the injury rate -- and when we talk about injury, we're including everything, not just broken bones; we're talking about strains, sprains, burns, the whole 9 yards -- the doubling rate for injury in the United States is every 5 years. That's a staggering number when you think about it. And again, the word injury is really all encompassing, but it is a growing group, and part of that may be this overuse phenomena that we see in our adolescent and young athletes. I think there's a lot that drives that. I think it's youth sports. I think it's, like you said, the drive for a collegiate scholarship or the drive to be semiprofessional, professional. I also think part of the drive falls on the physicians and healthcare providers in terms of prevention and sage advice when you're counseling these adolescents in terms of their overuse.

The other thing that we're seeing, frankly, at least from an orthopedic trauma and injury perspective, is this concept that some of the injuries that we're taking care of now didn't exist 20 years ago. You know, 20 years ago if you were in a bad motor vehicle collision or you had a bad fall, emergency medical services weren't equipped to be able to manage you in the field, give you blood products, stabilize your pelvis and do the things that they can do now to get you to a Level 1 trauma center to be cared for. Similarly, cars didn't have air bags, people weren't encouraged to wear their seat belts, and so that same injury that would decimate your lower extremity or decimate your arm would also drive your steering wheel through your chest wall, essentially killing you on the scene. Those injuries aren't happening anymore, not the fatal chest, abdominal, head injuries thanks to modern technology and modern in-the-field healthcare delivery, some of which has been taken from our military. But what we are seeing is this really severe level of increased injury in our patient population because they are surviving their initial traumatic event. When you talk about overuse, it reminds me that there are a whole plethora of injuries now, overuse and otherwise, that we're seeing that didn't exist 25 years ago. They didn't exist 30 years ago.

Dr. McDonough:

That's really interesting. By the way, if you're just tuning in, you're listening to Medical Breakthroughs from Penn Medicine on ReachMD. I'm your host, Dr. Brian McDonough, and I'm speaking with Dr. Samir Mehta, an Assistant Professor in the Department of Orthopedic Surgery at the Perelman School of Medicine at the University of Pennsylvania.

Fascinating conversation talking about the orthopedist's approach to these issues and, really, what we see in practice and how we deal with it. When you have an orthopedic emergency, some things obviously need to be done immediately. Other things can wait. How do you break that down, like make that determination of something that you really don't have to come in at 3:30 in the morning, let's say, to deal with and can wait?

Dr. Mehta:

So, I think when we talk about orthopedic trauma, and when I say trauma, I also include fractures in that, even sort of run-of-the-mill

fractures. When we talk about orthopedic injury, we divide them up into colloquially hot and cold trauma. Hot trauma is exactly what it sounds like. It's that open tibia fracture that happens after you get hit by a bus. It's the compartment syndrome where you've got blood that's collecting in the tibia resulting in acute neurologic changes. It's the fracture of the wrist that's leading to an acute carpal tunnel syndrome. It's those things where you're seeing neurologic or vascular compromise or soft tissue compromise that without immediate action you're going to have irreversible detrimental changes. That's hot trauma.

Then on the flip side we have something called cold trauma or elective trauma. This is more of what you would consider run-of-the-mill trauma. These are things like ankle fractures, wrist fractures, shoulder fractures, where the outcome is not dependent on the timing of intervention but rather, I would argue, the quality of the intervention when it's performed. And as we move towards all these changes in healthcare, things like bundled payments, quality of care payments, this is going to become even more important: What's the level of care that you're receiving? And so, as we look at some of these types of injuries, the ones that need acute attention are the ones where clearly the patient will have a detrimental effect. One of the classic ones that we talk about is the geriatric hip fracture. For instance, our goal or our goal has become to fix these within 24 hours of presentation because we know that if we can fix a senior person with a geriatric hip fracture, femoral neck intertroch (sic) and get them mobilized within 12 to 24 hours, that we significantly decrease their morbidity and their mortality at 30 days, 90 days and 1 year. Now, when you think about a hip fracture, you realize that's not that big of an injury. It's a low energy fall. It's not like an open tibia fracture or an open femur fracture or a pelvic fracture. True, but we know that the systemic effect from that hip fracture is tremendous, and the immobilization and the delay to surgery can be the cause of a high morbidity and mortality. So, there are definitely injuries on that spectrum that you may not consider hot that we deem important because the timing is so important. So, I think there's that big differentiation between hot trauma or hot injuries and cold trauma or more elective trauma where you can, for lack of a better word, you can electively choose to have your fracture fixed.

Dr. McDonough:

I can also see, from your answers, a lot of medicine you're now providing and the care is evidence-based. You're looking at things we've learned from before and taking that as part of your approach.

Dr. Mehta:

Yes, I think especially in those patients who are acutely injured -- and again, I'm going to pick on those geriatric hip fractures for a minute -- we know that evidence-based, multidisciplinary, team-approached care is so important for a good outcome. It's not just about fixing the hip fracture. And I think there's a running joke among orthopedics, "bone broke, me fix," and so we somewhat joke around about that, but the reality is for us to do what we need to do, it's a team effort. And that's one of the things about trauma and fracture care that you realize is it's truly a team effort. In the case of the geriatric hip fracture, we've got the geriatricians involved; we've got the medicine doctors involved; we've got the anesthesiologists involved; we've got the nursing staff involved; we've got the medicine team involved; we've got physiotherapy; we've got the rehab doctors; we've got social workers. Everybody has got a chip in the game, and everybody needs to participate for that patient to really have a great outcome. No different than when a patient comes in with an open tibia fracture. And it's not just about putting a rod down the leg, but you need to have all those members of the team in place -- the plastic surgeon to do the soft tissue coverage, the vascular surgeon to do the vascular repair, the trauma team to be able to take care of the patient as a whole, the orthopedic service, the ICU, the nursing staff, the radiologists, the imaging study. Part of the reason why I love what I do is that it's not just about going to work, doing some surgeries and going home. It's really that team, community effort, and managing all of these patients, whether they're the hot fracture patients or the cold injury patients.

Dr. McDonough:

You've been in surgery and you deal with surgeons all the time. I work in the primary care field. One of the things that when I first got into medicine -- I'm a bit older than you -- when I first got in, surgeons kind of, they operated and said, "That's what I do; that's what I'm going to do." I have seen surgery change to a large extent now where many of the surgeons, and I can tell from talking to you, are really thinking about the total patient visit, not just what you're doing in the OR, but as you say, all those other aspects, and that is so crucial to them getting better.

Dr. Mehta:

I totally agree. I think, especially when it comes to fracture **(inaudible 11:37)** injury, it starts with access. One of the things that I find sometimes discouraging is when patients who have injuries sort of get bounced around and sometimes can't get into the right hands, and it may be because people don't know that this injury pattern needs to be fixed or this injury pattern should be fixed or who even to fix it. And I think part of that is the communication that your specialists have with your primary care colleagues and with emergency rooms, and then, again, starting with that access point and then working through the continuum of care, right, from not just getting in to see the physician or the provider but also then the appropriate diagnostic tests, the appropriate operative or nonoperative management, appropriate physiotherapy, long-term follow-up, following patients until you get to an outcome that is desirable for all parties, knowing that if you have a complication, who do you turn to and how do you address that. These are all important parts of that continuum of care, and it's not just being a technician anymore that just shows up in the operating room and decides that, "Hey, I'm going to fix this fracture," or, "I'm going to put in a catheter," or, "I'm going to be an interventional radiology jockey." I'm going to take care of this patient as a whole and be a part of the team that does that.

Dr. McDonough:

One of the issues that can happen, of course, is someone has a fracture and all attempts are made to have it heal properly but it starts to heal improperly, and we're already days or weeks even into the process. What do you do in that situation? I know at Penn you have a way where you can try to help that out a bit.

Dr. Mehta:

And, Brian, you mentioned weeks or days. Sometimes it's months. In fact, I saw a patient recently it was a year and a half from his original injury and he wasn't healing.

Dr. McDonough:

Wow.

Dr. Mehta:

I think the key is to really get these patients to the right people or person or team. Historically, orthopedic trauma and orthopedic fracture care was something that everybody took a shot at fixing. Everybody kind of did their orthopedic care wherever their specialty was -- hip and knee replacement, spine -- but they took a trauma call and they took a fracture call, and so whoever came into the ER,

whoever came into the emergency room, you just sort of took care of them and you did a good job. Over the last decade, 20 years, there has been an increased interest and increased training for those people who have a real interest in orthopedic trauma and fracture care. Just like for hip and knee replacements, there's experts, just like there's experts for shoulder arthroscopy or ACLs, just like there's experts for hallux valgus or bunions, and there are now experts in the field of orthopedic trauma and fracture care. As such, one of the things I think is important is to know who those people are in your community and get those patients to your orthopedic trauma and fracture specialists because they are the ones who are going to be comfortable managing a nonunion or a malunion or a delayed union or an infected nonunion or a sinus tract with a retained hardware. And, in general, patients who have fractures probably should be managed by those who have an interest in fracture care so that they can also address those complications early. One of the things that often times I find tough to manage is those patients who have been wallowing maybe for 6 months, 9 months or a year where their problem could have been addressed in a much more efficient fashion and better fashion, potentially, had they been referred at the 6-week mark or at the 3-week mark where it was still correctable in a relatively easy fashion.

So, I think it's important to know who those people are in your community and get them into those hands sooner rather than later. We joke around sometimes, benign neglect works really well, but in a case of an acute fracture patient or a chronic fracture patient, sometimes you may have to go in and do corrective surgery.

Dr. McDonough:

We have a little less than a minute left. I wanted to ask you, Dr. Mehta, what is it about orthopedic surgery that you love the most? Obviously, you're enthusiastic. You can tell in the interview. But what is it that really excites you about that specialty?

Dr. Mehta:

I think what excites me the most about orthopedic surgery, particularly orthopedic trauma, is our ability to make a tangible difference in a patient's life and a patient's outcome by fixing the problem. With all due respect, one of the things that frustrated me, as a medical student, was when I would see patients in the clinic and I was trying to intervene, trying to help them manage their diabetes, manage their heart disease, and sometimes I felt like it was falling on deaf ears and/or I wasn't able to fix the problem, and I couldn't control their diabetes, I couldn't control their medical, their hypertension. I couldn't turn it off or make it better or make it go away. And one of the things that I love about what I do -- and this is probably, I think, my personality and maybe a lot of people who do orthopedics -- is that we can make it better and we can potentially solve the patient's problem and give them an improved quality of life, and that's what really appeals to me about what I do and how I do it.

Dr. McDonough:

Dr. Samir Mehta is an Assistant Professor in the Department of Orthopedic Surgery at the Perelman School Of Medicine at the University of Pennsylvania.

Dr. Mehta, I want to thank you for sharing your insights tonight. It's been a really fun conversation.

Dr. Mehta:

Great. I want to thank you for your time. I appreciate it. I look forward to interacting in the future.

Dr. McDonough:

I am your host, Dr. Brian McDonough. Thank you for listening.

Narrator:

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