

Melanie Cole, MS (Host): Welcome to the podcast series from the specialists at Penn Medicine. I'm Melanie Cole. And today, we're highlighting Penn's Orthopaedic Centers of Excellence Program. We have a panel for you today with Dr. Samir Mehta, he's the Chief of the Division of Orthopaedic Trauma and Fracture Care at Penn Medicine; and Dr. Derek Donegan, he's an Associate Professor of Orthopaedic Surgery in the Division of Orthopaedic Trauma at the Hospital of the University of Pennsylvania. Doctors, thank you so much for joining us today. Dr. Mehta, I'd like to start with you. Provide a little bit of an overview about what you and Dr. Donegan will be speaking about today.

Samir Mehta, MD: So, Dr. Donegan and I will be talking about fragility fractures of the pelvis. These are low-energy fractures of the pelvic ring, typically involving frail or geriatric patients. These can be fairly debilitating in terms of patient's inability to walk and mobilize due to pain or instability of the pelvis. This is not dissimilar to the concept of geriatric hip fractures. Many providers are familiar with the concept of an older person having a low-energy fall resulting in a hip fracture that can be significant in terms of their morbidity and mortality.

Host: Thank you so much for that, Dr. Mehta. And Dr. Donegan, tell us a little bit more about fragility fractures of the pelvis. How common are these fractures and really the prevalence, the most common way that they happen as well.

Derek Donegan, MD: Yeah. I'd love to. So, fragility fractures of the pelvis, they're becoming a clinical entity of increasing frequency. In general, a fragility fracture is a fracture that is caused by an injury that would be insufficient to fracture a normal bone, just due to the pathology of the bone being a little bit more brittle, a little bit less resistant to the forces that our normal day to day life exerts upon it. A fragility fracture of the pelvis occurs in the pelvic ring or acetabulum, also known as the hip socket, that result in an event typically like a ground-level fall or something pretty low-energy that would otherwise be insufficient to fracture normal bone.

As far as how common they are, Samir and I published this about nine years ago, using an inpatient sample from the United States looking at over 600 million Medicare hospital discharges from an 18-year period from 1993 to 2010. And we found that in that time period, pelvic fractures in that specific patient population, so Medicare over age of 65, had increased by about 24%. There's been some more recent studies looking at this, which has shown the increased incidence from about 73 out of 100,000 up to 364 per 100,000, recently in people

over age of 80. And that is predicted to be about three times that come 2030. So, it's common and it's becoming more common, and we are seeing a lot more of it in our practice.

Host: Well, then along those lines, Dr. Mehta, speak about the causes of fragility fractures of the pelvis.

Samir Mehta, MD: When we think about fragility fractures of the pelvis, there are a couple of different sort of entities or patient populations that we look at. The first is the frail patient, the older patient who has a low-energy fall, fall from standing, fall from a small height. They typically land on their pelvis, typically on the side or directly on their bottom. And they have difficulty ambulating or walking. They have immediate pain. Imaging typically is done, an x-ray. Most people are looking for the hip fracture because that's what's programmed in everybody's brain, and the hip x-rays are negative. The next step would be to get a CT, which may or may not happen. And I would encourage our clinicians who are listening that if they have a patient who has this kind of a mechanism, age, difficulty mobilizing and negative x-rays to please get that CT next to see if there's a fracture of the pelvis on CT.

The second subset that we see, which is a little less common, but prevalent, is the high-energy, older patient pelvic ring injury. We have patients who are older who are doing more high-energy activities. Not just their activities of daily living, like driving to the supermarket or things like that, but also things like skiing, pickleball, sports like that. And they can have a fall doing those activities resulting in a pelvic fracture.

The last sort of group that falls into this fragility fracture of the pelvis is this concept of what's called an insufficiency fracture, or what is sometimes referred to in the athletic population as a stress fracture. We see that patients who are osteoporotic, who are older as they do more activities, are more ambulatory, will sometimes have stress fractures of their pelvis that then progress to the point of being very symptomatic. And these also fall into that fragility fracture of the pelvis category. There are things that contribute to this: age, limited or lack of activity if they're falling into the frail population, certain medical conditions like diabetes; certain medications, such as high doses of steroid, things like chemotherapy or radiation therapy, all predispose patients to getting a fragility fracture of the pelvis.

Derek Donegan, MD: Yeah. Dr. Mehta, it just reminds me of two patients I recently took care of that kind of run the same gamut. A lady who was in her late 70s who had been having some pelvic pain in the back of her pelvis for a little bit of time. Radiographs were negative. Someone finally got an MRI, showed some stress reaction, ultimately progressed to bilateral

insufficiency fractures of the sacrum. And then contrary to that, a 73-year-old who was in an accident and had a high energy pelvic ring injury as well. So, kind of highlighting both of those patient populations that you mentioned.

Host: This is so interesting. And Dr. Donegan, I'd like you to speak a little bit about treatment. What does that look like for patients with these types of fractures of the pelvis? And what are the benefits to patients being treated at Penn Medicine?

Derek Donegan, MD: The treatment kind of runs the gamut from non-operative to operative-based treatments. And while this is all individually based on the imaging that we see and the diagnosis that we make and a little bit of the patient characteristics as well, what we tend to see is traditionally, management of a lot of these fragility fractures of the pelvis would be considered non-operative and would also consist of a period of anywhere from 10 to 12 weeks of either protected weight-bearing or non-weight-bearing, which really kind of delays the mobilization of these individuals.

In our patients, when we decide to treat, it's all about getting them moving as quickly as we can. And so, if we're able to safely treat these individuals without surgery, but allow them to mobilize immediately, then that's the path we go. If we're not able to mobilize these people individually without surgery, then we tend to treat these people surgically and make them weight-bearing as tolerated immediately.

Oftentimes in our hands, it's through minimally invasive approaches, small incisions using fixation devices that allow for stability of the pelvic ring and allow these patients to weight bear as soon as possible. Specifically, newer technology such as curved, flexible implants.

Just to follow up on that previous example, the lady who I had mentioned the insufficiency fractures of her sacrum, we just saw her back a little bit ago. She was about six weeks post op from these bilateral sacral fractures and a left sided superior anterior ramus fracture. And she was walking pretty much pain-free with a walker at her six-week post-op visit. Traditionally, she would have still been non-weight-bearing or protected weight-bearing for another four to six weeks after that time period. So, we're definitely seeing an expedited path to recovery and getting these people up and moving pretty quickly.

Samir Mehta, MD: To further that, I think one of the things that always has sort of struck me about this is if a patient were to come in with a geriatric hip fracture, about 90-95% of those patients get surgery because the benefits of surgery have been clearly shown in decreasing morbidity and mortality for hip fractures. I don't think there's any clinician out

there who would not recommend surgical management for a hip fracture because of the immobilization, the being bed-bound, the difficulty with walking, the prolonged hospital stay, et cetera, that complicates those patients who have geriatric hip fractures if they don't get fixed and moving.

In the case of fragility fractures of the pelvis, about 10% are getting surgery, not the 90% that are getting a surgery if they have a hip fracture. But there's a scenario of difficulty with mobilization, being bed bound, having challenges with activity are all still very similar. In this scenario there is an opportunity to treat these patients relatively percutaneously, relatively minimally invasively to get them up and moving.

I think one of the challenges has been that historically when people think of pelvic fracture surgery, they think of high blood loss, complex, complicated surgery, which to some degree it is. Having said that, there are lots of clinicians out there who are orthopaedic traumatologists, like Derek and myself at Penn Medicine, who are able to place screws percutaneously into the pelvis and do it in a near outpatient basis to get patients up and moving.

And on top of that, we have access to now novel technology that allows us to put implants into a very abnormally shaped bone. What I mean by that is that the pelvis has a very atypical shape. It looks like a pretzel. All those curves, et cetera, that a pretzel has, the pelvis has as well. And so having access to an implant that is curved that allows you to cut around corners and get into small areas has changed our paradigm a little bit in our ability to treat these patients and then immediately weight-bear them after being operatively treated.

Derek Donegan, MD: Yes, Samir, just to follow up on that the other patient I mentioned who was thrown was initially sent to an outside facility, diagnosed with this pelvic ring injury, was actually taken to surgery by a very well-trained orthopaedic trauma surgeon to percutaneously fix her pelvis. But due to dysmorphism of the sacrum, he was unable to successfully and safely complete the surgery. That patient ultimately got transferred down to Penn Presbyterian. And using some of these novel techniques and technology with curved implants we were able to safely navigate the corridors of her pelvis, stabilize her pelvis, and she was up and walking the next day.

Host: Wow, that's fascinating. Dr. Mehta, please speak about some of the research that Penn Medicine is conducting regarding fragility fractures of the pelvis and where you see it going in the next 10 years or so. Give us a little blueprint.

Samir Mehta, MD: So, we have a few different projects happening. We have one that we're looking at with a few other hospitals looking at a retrospective study of our patient population in terms of the protocol and process of immediate weight-bearing after fixation of their fragility fracture of their pelvis.

As I said before, Derek mentioned this as well, that is a little atypical in terms of fixing and weight-bearing immediately, and we've seen good results at our center, and we're hearing similar things at other level 1 trauma centers that are doing this procedure. And so, we are looking to put that data together to show that you can fix people who have this injury and get them up and weight-bearing right away, like we do for, geriatric hip fractures. And similarly, we have a prospective clinical trial that we're doing with a multi-center group looking at the use of curved implants and longer-term outcomes in patients with high energy pelvic fractures as well as fragility fractures of the pelvis.

Host: Doctors, I'd like to give you each a final thought for the show here today. Dr. Donegan, when should physicians refer their fracture patients to the Penn Orthopaedics Trauma and Fracture Program?

Derek Donegan, MD: I would say whenever there is a diagnosis of a fragility fracture of the pelvis. You know, I think the historical thought process of treating these injuries has changed significantly. And Samir and I have been thinking about this for a long time and advancing technologies to treat these individuals and get them up and moving and back to a good quality of life and optimizing their outcome and their care has been at the forefront of what we've been doing. So, I would say that the sooner that these patients can get to our center and be seen by one of us, the quicker we can get them moving in the right direction and back to their normal state of health that they were before they were injured.

Host: And Dr. Mehta, last word to you. Tell us about the Orthopaedic Centers of Excellence Program, the multidisciplinary approach for these patients and anything else you'd like to share for other providers today.

Samir Mehta, MD: I think one of the things that we benefit from is having a great team. We have a great team of therapists and physician assistants and nurse practitioners and residents and surgical services and advanced imaging technologies and radiologists to help us not only identify, but also treat and follow our patients that we fix. And I think that makes us truly unique.

I think one of the other things about this particular entity is it is really personalized care, right? The idea of fixing somebody's pelvis, I think you have to understand what the goals of their care are, what they want to do, where they want to be, what their timelines are. And so, I think this care is really tailored to the patient and, to some degree, is personalized medicine.

Host: Well, it certainly is, and what a comprehensive approach. Thank you both for joining us today and sharing your incredible expertise for other providers. To refer your patient to Dr. Mehta or Dr. Donegan at Penn Medicine, please call our 24/7 provider-only line at 877-937-PENN, or you can submit your referral via our secure online referral form by visiting our website at [pennmedicine.org/refer-your-patient](https://www.pennmedicine.org/refer-your-patient). That concludes this episode from the specialists at Penn Medicine. Please remember to subscribe, rate, and review this podcast and all the other Penn Medicine podcasts. Until next time, I'm Melanie Cole.