

**TOTAL KNEE ARTHROPLASTY  
CRITTENTON HOSPITAL  
ROCHESTER HILLS, MI  
June 14, 2007**

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ANNOUNCER: Welcome to Crittenton Hospital in Rochester Hills, Michigan. Over the next hour you'll see a minimally invasive primary total knee arthroplasty featuring the Vanguard Complete Knee System, Microplasty Elite Instrumentation, and the Biomet Microplasty Tibial Tray from Biomet Orthopedics, Inc. Biomet's Microplasty Elite Instrumentation was built upon the heritage of the Microplasty Instrumentation. In just moments, you'll see how the Microplasty Elite Instrumentation turns a potentially challenging minimally invasive procedure into a more reproducible approach. OR-Live makes it easy for you to learn more. Just click on the "request information" button on your webcast screen. Now let's join the doctors.

00:01:03

KEITH R. BEREND, MD: Good evening, and welcome to Crittenton Hospital and Medical Center in Rochester Hills, Michigan, where I'm pleased and privileged to introduce Dr. Jeff DeClaire, who will be performing a Vanguard Microplasty Total Knee Replacement utilizing the Microplasty Elite Instrumentation and using the new Microplasty Tibial Tray. I'll give it over to Jeff to give us an introduction to the patient demographics and the x-rays. Dr. DeClaire?

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JEFFREY H. DeCLAIRE, MD: Thank you, Dr. Berend. I'd also like to welcome everybody here at the Crittenton Hospital and Medical Center in Rochester Hills, Michigan. What we're going to be doing tonight is demonstrating a minimally invasive total knee arthroplasty on a 64-year-old female who has had end-stage disease with chronic pain which has not responded to the usual conservative measures. We're going to be utilizing the Vanguard Complete Knee System, which we will also be demonstrating a newly designed instrumentation system called the Microplasty Elite System. In addition, we will also be utilizing a newly designed tibial component called the Microplasty Tibial Tray, which has a modification of the tibial keel as well as a different shape that we think can facilitate the preparation and insertion of this component. The patient that we're going to do today, as I said, is a 64-year-old female. And before we talk about her x-rays, I would first like to introduce my surgical team and also thank Dr. Keith Berend from the Albany Hospital in Columbus, Ohio, who has come to share his expertise with us, and I thank you for that. We have one of the best orthopedic departments here, I think, in the country and one of the best orthopedic teams. My first assistant will be Janice Schwartz. She'll be standing across from me. We have Paula Ward, who'll be on my left, and Anita Lee will be handling the instruments. In the background taking care of all the things that we don't see will be Teresa, Leslie, Colleen, and Jona. And our anesthesia is headed by Dr. Les Walsh and Cheryl May. The patient as I said is a 64-year-old female. If you look at her x-rays here you'll see that there is a complete loss of articular cartilage, primary medial compartment disease, but you can see she still has disease that's migrated and progressed to the lateral compartment. Looking on her lateral view you can see the wear behind the patella. And she'll be a little bit challenging in that she has limited flexion to approximately 100 degrees but does have full extension.

As we get started, I'm going to turn it over to you, Dr. Berend, and we'll get ready to proceed.

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KEITH R. BEREND, MD: Thanks, Dr. DeClaire. It does look like a relatively challenging case, especially with limited flexion. We're going to get started here as Dr. DeClaire gets his exposure ready. Again, we'll be using the Vanguard Complete Knee System. We're going to be looking at both the knee system, the new instrumentation, as was mentioned, and the Microplasty Tibial Tray. So it looks like Dr. DeClaire is getting ready. Dr. DeClaire, what approach are you going to be using? There's been a lot of debate and a lot of discussion about what approach is best. Do you think there's any one approach that is better for minimally invasive, or how do you judge what you're going to do for each patient?

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JEFFREY H. DeCLAIRE, MD: That's a great question. Now, there's several different approaches that have been popularized. We're going to use a minimally invasive midvastus approach. I find this approach can give us excellent extensile exposure, and I think the key thing with any minimally invasive approach, but really any approach surgically, is to have the exposure you need to perform an accurate total knee arthroplasty. I've had the pleasure of doing all three approaches: one, the medial or minimal or capsular incision, as well as the subvastus and midvastus, and I really think that each of these can really give comparable success. I think that I'll definitely improve the clinical success in the early phase of recovery from our standard, more traditional approaches. What I've done here is I've drawn out the patella and the tibial tubercle. You can see the patellar tendon here, and I'm going to slightly medialize the incision. If you use these landmarks, most of the times this incision length will be anywhere from three to five inches, depending on the anatomy of the patient. Right now she's measure right around 3.5, but you can see I'm going to go slightly above her patella here to give us a little more exposure. I think a very, very important part of minimally invasive knee surgery is, again, performing the surgery accurately. And it's really not the size of the skin incision that's key but really preservation of the quadriceps muscle and quadriceps function, which involve a whole gamut of things, even starting preoperatively.

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KEITH R. BEREND, MD: Now, you measured out your incision. You're doing it in extension, which is obviously what is always best to measure the incision because it makes it a lot shorter. Is there any advantage to doing the exposure in extension? Do you find the anatomy easier? I usually do it in flexion.

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JEFFREY H. DeCLAIRE, MD: Yeah, I've done it both ways. It certainly -- I think that's a preference -- in fact, most of the time I do do it in flexion. I kind of did it here to show what we're going to be doing and just for demonstration purposes.

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KEITH R. BEREND, MD: Yeah, that's a great view.

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JEFFREY H. DeCLAIRE, MD: I think in flexion you can see where you're going to be doing your surgery and can outline your incision a little more, maybe, accurately. What we've done here is made a limited exposure. I'm going to outline, again, the patella. And if you look over here you can see the fibers of the vastus medialis. So if we were doing a subvastus, we'd be entering in this area, the patellar tendon's down in this area, and our quad tendon's up here.

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KEITH R. BEREND, MD: No, and that's a great view there as you go ahead and mark out where you're going to go with your intramuscular incision there. But you see here, as with the majority of patients, you know, Mark Pagnano and his group showed that almost every patient, the quadriceps actually inserts halfway down the kneecap. And so all of these

exposures do come into the quadriceps mechanism in some way with the exception of the subvastus, perhaps, which instead dissects medially instead of through the quad; it dissects the quad off of its origin. So that's a great anatomy there.

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JEFFREY H. DeCLAIRE, MD: So we've made our capsular incision. We're going to come down into the proximal portion of the tibia here. And you can see how that patella is going to displace laterally. We're going to do the procedure without eversion of the patella. And at this point, in order to gain exposure, I will resect a portion of fat pad. We'll be taking more of this later on as we need to gain our exposure.

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KEITH R. BEREND, MD: Do you think there's any negative to doing that?

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JEFFREY H. DeCLAIRE, MD: No, I really don't. I think there's good evidence that it really doesn't affect the blood flow to the patella, and it definitely aids in your exposure.

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KEITH R. BEREND, MD: Now, you mentioned you're going to come around the medial side here for your initial exposure and release, obviously, but one thing you mentioned right away was this was a 64-year-old patient, so, you know, or mid to early-60s. What would you say the average age is of your knee arthroplasty practice?

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JEFFREY H. DeCLAIRE, MD: I think the average age is probably in that 60 to 63 age range, although we are seeing that number slowly decrease as there are more and more patients who are having end-stage disease as it particularly relates to the baby boomer population, which is continuing to grow. And as that grows, then the incidence of degenerative arthritis is growing as well. What we've done here now -- I did my medial release there. She doesn't have a severe contracture so we didn't do a very extensive release. I'm then just using a simple towel clip, we've displaced our patella. You can see the disease here with wear on both patellar side and trochlea. We'll get a better view of the femoral area as we move along. And what we're going to do here then is basically, again, same things that we've done along, is measure the thickness of this patella. We want to retain, again, normal anatomy, and then --

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KEITH R. BEREND, MD: How thick did you have there, Jeff?

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JEFFREY H. DeCLAIRE, MD: She was about 17 millimeters, so she --

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KEITH R. BEREND, MD: She's starting out thin.

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JEFFREY H. DeCLAIRE, MD: She's a little thin, yes.

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KEITH R. BEREND, MD: And I think one of the big advantages that -- I'm sure we'll get through a lot of the other advantages, but with this knee system I've found, especially in patients exactly like this, the sort of thin, tall, long-boned female, starting out with a thin patella, we don't want to increase the thickness too much and the availability of the thin patellas. Have you used any of those?

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JEFFREY H. DeCLAIRE, MD: No, I haven't.

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KEITH R. BEREND, MD: They've got a series of thin patellas for us so that you don't overstuff those, and I've found it very useful for these patients.

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JEFFREY H. DeCLAIRE, MD: What we're going to do is I'm going to do a freehand resection. You could do this with instrumentation in a very simple manner. You can see I've cleared off

the synovium and fat pad. And if you follow this ridge of osteophyte with your saw blade and start at the inferior pole, it really becomes very simple. Start here, and you can see I can see my saw blade here as I -- She is thinner on her lateral facet, which is typical. But now I can see my resection, and then I just carry this over to the more superior pole, and we've done our resection. And that feels good to me. I'm going to now measure this again. She was -- again, what we're seeing here, she's about 10 on the lateral side. Let me see that saw blade one more time. And she's about 12 on the --

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KEITH R. BEREND, MD: While you're doing that, I'll invite all of the viewers to send your questions via email, questions or comments that you have for Dr. DeClaire.

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JEFFREY H. DeCLAIRE, MD: And that looks good there. Okay. Now we're going to proceed, and the next step here is to do our distal femoral resection. As we go through this, you'll see that the exposure short of opens up gradually. And it's a little different philosophy than we've been used to in the past. We typically would make a very large incision and expose everything right away. Now what we do is to expose it sort of sequentially, so by resecting the patella now my patella retracts very easily. And let me just show you this. We use a retractor here that's been designed to protect the patella throughout the procedure. This has been very useful in not only displacing the patella -- very easily it goes into that gutter - - but as we do our surgery we're going to protect this resected surface.

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KEITH R. BEREND, MD: Yeah, and I assume those nicks and notches on there were from times that I would have damaged the patella --

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JEFFREY H. DeCLAIRE, MD: Exactly.

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KEITH R. BEREND, MD: But instead we hit that guide. That's a great instrument.

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JEFFREY H. DeCLAIRE, MD: What I'm doing here, again, this is another principal. And again, a lot of the things you're going to see tonight you don't necessarily have to create a small incision, and there's a lot of data to support that, and even some of our own data from our practice. But it's really minimizing soft tissue trauma. So rather than a large resection of synovium, I made just a small little window so I can reference my distal-femoral condyle when we go back to do our sizing and rotation. We're now going to flex the knee. And again, a little variation of what's been done in the past. Rather than hyper-flex this knee to gain exposure, we're going to flex it to roughly about anywhere from 60 to 90. She's at probably maybe 70 degrees right here. You can see the degenerative change that she has is quite extensive on that medial side, not too bad on her lateral side. This distal femoral resection guide -- a little tight there -- this distal femoral resection guide has been modified. Rather than cutting from the anterior aspect of the femur, what we're going to do is a slight combination of lateral and anterior. Now, you may have seen, or there are guide systems on the market that you can resect from the lateral side, which do create some difficulties and challenges.

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KEITH R. BEREND, MD: So you're coming in a much more classical manner. You have a good view of the anterior aspect of the femur, so you're not truthfully going straight medial.

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JEFFREY H. DeCLAIRE, MD: Correct.

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KEITH R. BEREND, MD: You're biasing it to the anterior medial aspect so that you can not have to go as far proximal with the instrument itself just for this step to the operation where you don't ever need to be this far proximal again to complete the operation.

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JEFFREY H. DeCLAIRE, MD: Exactly. And that's a great point, and let me just take a moment to show you that, what you just talked about. When you go straight lateral, the patella has to come over more in order to gain the exposure laterally. And it makes for a difficult viewing of your lateral side. You can see here, again, I talked about sequential exposure. First thing when you bend the knee that comes and hits you in the face here is your femur. So now -- and this is where we're going to address this. What we're going to do now is resect this utilizing, again, from a right, straight like you normally would for your medial side, but with just slight rotation of the saw blade we'll going to get all the way over to our lateral side. And if we needed to, we can even come into this quadrant.

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KEITH R. BEREND, MD: We've got a good view of that. One of the interesting things about the Microplasty instruments is, I've found, and I think most of us who are using these instrumentation sets, these have become very, very beneficial not just in incorporating minimally invasive surgery into your practice but taking care of the larger patient, morbidly obese patient, these instruments actually make the operation much simpler than the way the operation used to go in the morbidly obese patient. And so I've found that it certainly has helped the OR and the OR team and myself to be able to help a lot of patients that otherwise might not be good candidates for these kinds of operations.

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JEFFREY H. DeCLAIRE, MD: Yeah, I think that's a great point in that some of the more difficult patients this has really facilitated. And that's really the thing about this instrumentation is you can use it with any exposure. That distal femoral resection guide does not change the valgus angle at all. It still cuts it in the same accurate manner, but it's much easier. You can see up here we did not have to retract our quadriceps muscle, especially with a subvastus approach. It's much more accommodating to that. What we've done here now, and this is I think another key step, is we've placed two retractors. These are "Z" retractors, but you can use anything like that. This will protect the medial side, or medial collateral ligament. The lateral is protecting patellar tendon. The next step we're going to do here is resect the tibia. A key step or point here is removal of the anterior cruciate ligament. If we remove the anterior cruciate ligament, I can put in this Hohmann retractor. It allows for an anterior drawer, and you can see we've got complete exposure of our tibia here so that we can accurately size this and then accurately make our cut.

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KEITH R. BEREND, MD: And safely resect it. You're not cutting blindly, you're not cutting from the side where you can't see. I think that's a very important point. I would say that this visualization right here through the small incision, small approach, is as good as any exposure you can get through any size incision. You haven't compromised anything at all.

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JEFFREY H. DeCLAIRE, MD: And again, I keep emphasizing that minimally invasive techniques can definitely enhance a rapid recovery for the patient.

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KEITH R. BEREND, MD: What would you say that sort of the average recovery time, or normal recovery time is for a knee surgery patient? I know you have a hospital colleague of yours here that you had come out in the hall. I'm sure you paid her off, but she said that she walked out of the hospital with no crutches, no walker, no cane, and returned to work. They made her stay out a certain period of time, but she was ready to come back a lot sooner than that. I'm not even sure she had knee surgery, really, looking at her. I think you may have planted her out there. But what would you say the average time is?

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JEFFREY H. DeCLAIRE, MD: We've looked at our own patients, and actually the average time on crutches ranges between from 10 to 14 days. What I mean is on a walker. Most of our patients use a walker. But it does vary depending on the person. We encourage early range of motion as the first priority with a minimization of swelling and pain. And if we can achieve

a knee that has minimal pain with good motion, then return of muscle comes easy, and return of function then follows. Now, there are some patients that have been back at work in two weeks, playing golf in six weeks. Again, it does depend on the patient and the clinical condition. What we're doing here now, and let me take a moment to point this out to you, this is a tibial resector, part of the system. We've lined it up with our tibia. We -- it allows us to fix the component to the bone so that I can then assess my cuts. Now, you saw I used an angel wing here that gives me a reference of where this resection's going to be, and then also I can check with a guide here that tells me how much I'm going to be removing off of the lateral side. This is roughly around 9 to 10 mm off of the lateral side, which is the normal side, and our medial side is roughly around 2. She might be just a tad more than 2. So there is an adjustment here that allows me to fine-tune that within millimeters so that we can have that accurate resection.

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KEITH R. BEREND, MD: And it's medially biased. I mean, you're clearly protecting your tendon and your ligament, and you've got good fixation there.

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JEFFREY H. DeCLAIRE, MD: And that's a key point. This -- the area of exposure because our tendon's over here is where this guide allows you to make this resection. It's captured at both ends, so there's a capture here so we can protect the saw blade from wandering, and it's also captured here. The way to approach this is to resect medial side first, and then we want to swing this way so we stay away from the tendon. We don't want to come into this direction first because our tendon's right here.

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KEITH R. BEREND, MD: I think that whole recovery discussion -- I was just mentioning that on that whole recovery discussion, you're sort of piecemealing that to get it out a little easier.

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JEFFREY H. DeCLAIRE, MD: Yeah, you can either take it out as one piece -- and I've done that, but many times it may fragment on you. Now I'm just really approaching it like a uni. So we've cut half of it out, it comes out very easily. The other half -- this will have attachments to the posterior capsul-- posterior lateral capsule as well as the posterior cruciate here. Now we're going to do a posterior stabilized knee, so we're going to remove that eventually. But you can see once I make that soft tissue resection here, this can come out without much difficulty. It really -- it comes out in a more controlled fashion rather than trying to break it into pieces.

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KEITH R. BEREND, MD: Yeah, and you didn't have to lever up on it or anything. I mean, you weren't crushing the bone if it was an osteoporotic patient or anything like that, so that was --

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JEFFREY H. DeCLAIRE, MD: And the other -- and you just made me think of another point there, Dr. Berends. When I usually that osteotome to lever it out, I leave the guide in, so the lever is the guide so you're not levering on the bone, which potentially in some patients is soft. So this gives you a good base to create that mechanical advantage to get that out of there.

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KEITH R. BEREND, MD: Well, as you're finishing getting rid of that normal ligament there, we'll talk about that a little bit later. But -- you had mentioned the post-op recovery, and I wanted to just mention that, you know, the whole concept of minimally invasive surgery and the Microplasty System and Vanguard Knee with high-flexion design and patellar femoral tracking that it has is really part of a rapid recovery protocol. You had mentioned that your hospital is engaged in starting a joint camp concept with Marshall Steele and his colleagues, and you know, this is just one key part of the whole recovery from this

intervention is the minimally invasive part of it. And the whole package is what changes the rehabilitation protocol.

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JEFFREY H. DeCLAIRE, MD: Yes. Like you said, it's really a whole program. And we have -- our hospital has just renovated an entire floor that's going to be dedicated to total joint replacement. And really it's a change, again, a philosophy in that the patients are really healthy. They're not -- they're not sick, so the environment that they recover in is a more home-type environment. But the program really starts preoperatively, and we can talk a little bit in more detail about that as we go here. But before we go further here, let me just show you this guide. This guide, what we're doing here is assessing, and let me just stop a moment here so I can mark out a couple landmarks before we go further.

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KEITH R. BEREND, MD: Mark those out, and remember as we're talking to -- let's you and I talk before this case about anterior versus posterior referencing. And you're using the posterior referencing instruments, and what do you think -- are there advantages or disadvantages to posterior referencing? Sort of go through that with us as you tell us what you're doing.

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JEFFREY H. DeCLAIRE, MD: What I'm doing here is marking the transepicondylar access, and again, as we talked earlier, the main goal here is to provide an accurate total knee arthroplasty with -- with accurate placement. So again, minimally invasive methods have been criticized that you can't see, but as you can see here, we're seeing this entire femur. What I've done is to iso-- identify the medial epicondyle and the lateral epicondyle -- do you have that osteotome? -- and the transepicondylar [dropped audio] rough guide here. You can see those are roughly perpendicular, and this is what we use to set our rotation and positioning of the femoral component. This guide system now, you can see it does move to accommodate your incision. And what we're going to do here is use this to assess size. The stylus does rotate, and so you can slip it underneath the tissue -- we have pretty good exposure here -- but once I rotate this, it locks in so that I can again accurately assess sizing. And she's measuring about -- it's between 60 and 62. Now, as you mentioned, posterior referencing systems I think have an advantage because what we're going to do with posterior referencing is keep our flexion space, or our posterior condylar resection constant or consistent. If we downsize, then the additional resection will be anteriorly, so we do have to worry about or be careful with notching. Now, again, this system has an option where if I wanted to sort of convert this or blend in an anterior system, I can change the -- the position by utilizing a different positioning hole here.

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KEITH R. BEREND, MD: So you can shift the blocks up 2 mm to go in between sizes, theoretically taking anterior referencing into your sizing, should you desire it.

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JEFFREY H. DeCLAIRE, MD: Exactly. What I'm going to elect to do -- I try not to do that so I can keep my flexion space. Every time you change your resection posteriorly, you're going to change your flexion space. And again, we want to balance this knee accurately, which I think is the disadvantage, or potential disadvantage of an anterior referencing system, that if you are in between sizes and you downsize, then you're going to affect your flexion space, and therefore that may affect the overall balance of the knee.

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KEITH R. BEREND, MD: Now, you used a fixed three-degree guide there. It looks pretty close. I routinely will use a dial-foot guide that I can change it to 4 or 3 or 2 or 1 or whatever it looks like, but looked like it was right where you wanted to be, right down Whiteside's line. Would you have changed that if it'd looked different?

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JEFFREY H. DeCLAIRE, MD: Yes. Yeah, I think that's a good point, that you do want to make certain that you have the appropriate rotation. Three degrees is a starting point, but certainly if more is necessary then that must be factored in.

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KEITH R. BEREND, MD: All right. Tell us about this block.

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JEFFREY H. DeCLAIRE, MD: This block -- again, redesigned. You can see the edges are contoured. So again, accommodate a smaller incision. It's well-fixed, very stable. This is our 4-in-1 cutting block. You can see the upper and lower resection guides are mobile, so again that we can accommodate, again, a small incision as well as to have access to all areas of the femur. We're going to cut the -- the -- this is a 62.5 first. As I said --

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KEITH R. BEREND, MD: Watch out for that cruciate back there.

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JEFFREY H. DeCLAIRE, MD: Yeah, you want me to say that.

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KEITH R. BEREND, MD: No, I mean it brings up a good point. You know, with this knee system you can go from a classical CR bearing with sort of no posterior lip to a posterior lipped CR bearing to an anterior stabilized, or deep dish bearing, to a PS to a PS with constraint, or the so-called PS-plus all with the exact same instrument set, all with the exact same femur and the exact same tibia, with the exception of a PS, which is the CR femur. And I think that's one of the really unique aspects of this knee system. It can really almost customize the knee in terms of the stability and the accuracy of the ligamentus reconstruction to the needs of that patient or the needs of that surgeon. And I think that's one of the unique things here. You know, I'm joking with the -- I routinely do a CR knee, but if the cruciate is not intact or it looks like a risk for late decompensation, you can quickly go to a PS or even an anterior stabilized bearing without having to change anything.

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JEFFREY H. DeCLAIRE, MD: Yes. I think that, like you said, is a unique feature of this system. There are actually 10 femoral sizes, which essentially means we can custom fit the knee to the patient. It also allows you to custom fit the knee to the anatomy based on constraint. And I think we look pretty good here. Debating here whether to go down a size. It looks like she could accommodate this.

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KEITH R. BEREND, MD: How is her ML width there?

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JEFFREY H. DeCLAIRE, MD: Her ML width is narrow, and this is the component that -- and we do look fine with this.

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KEITH R. BEREND, MD: Which is -- and you know, that's the big debate right now is the whole patellar femoral articulation and the AP mediolateral sizing for women and men. And I think one of the other distinctions of this knee design is, you know, since early 2002, 2003, this knee was really well thought out in terms of the AP to ML dimensions. And in the smaller sizes, the incremental difference between sizes is as small as 2 mm, so right now you're going from a 62 to a 60. It's actually 2 mm difference in the AP or the height of the condyles so that these half sizes and these smaller sizes routinely fit women extremely well without overhang or underhang. And the bigger sizes fit men better because of the incremental increase in size goes up in the larger sizes, which are predominantly used in men, and the incremental size difference goes down in the smaller sizes, which are routinely used in women.

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JEFFREY H. DeCLAIRE, MD: I agree.

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KEITH R. BEREND, MD: That looks perfect there, huh?

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JEFFREY H. DeCLAIRE, MD: Yeah. What we did -- there was a little more bone, and it felt that she was in between. And you can see what I did there was we went down a size. Again, the concern is notching, which this looks great. And all we did was reinsert the guide, and the only two cuts you need to make are the anterior distal cut and the shamford cut, and we're set to go here.

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KEITH R. BEREND, MD: So you've got a little lamina spreader there. Is that --

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JEFFREY H. DeCLAIRE, MD: Yep. What we're going to do now with the lamina spreader is, again, assess our flexion space, but now we're going to look in the posterior compartment, clean out meniscus, and then we're going to also clean out that wonderful posterior cruciate ligament.

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KEITH R. BEREND, MD: And as you're doing that, I mean, this is one of the most critical factors, cleaning out the back of the knee. I mean, all of the new knee designs are so-called high-flexion designs. They accommodate patients who end up with high flexion. But the only way to get a patient like this that had 90 degrees of pre-op flexion up to the 125-135 degree range which we should have with that thin of a leg is to clean out the back of this knee. And you've got to get all the osteophytes out, you've got to get all the scarred capsule out, and in this case take out the cruciate ligament, if necessary.

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JEFFREY H. DeCLAIRE, MD: That's correct, and that's what we're going to do here is spend some time taking out both medial and lateral meniscus and remainder of the anterior cruciate ligament as well as the posterior cruciate ligament. Once I clear the soft tissue we're then going to assess the posterior osteophytes both medially and laterally. As you said, I think there was a good poster exhibit at the Academy just this year that looked at this, and it's just what you said, Dr. Berend, is that if there is too much of this soft tissue or the flexion space is filled with osteophyte or tissue that that flexion won't be reestablished or regained.

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KEITH R. BEREND, MD: And also note while you're cleaning out the back here, I mean, you have an outstanding view of the back of this knee.

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JEFFREY H. DeCLAIRE, MD: Yep.

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KEITH R. BEREND, MD: You are perfectly safe cleaning out the back, you can see everything you need to see. So now you've got two lamina spreaders in there, so you're sort of --

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JEFFREY H. DeCLAIRE, MD: This has given me a feel for my flexion gap, and I feel that I -- the tension that I have and...have some calibration that we've got pretty equal balance of our flexion space right now, so I feel pretty good with what we've got going here. But before we leave here, you know, the other part of what we want to do is try to create some element of blood management or blood control. And I've been using this -- this bipolar sealant called the tissue link, which utilizes heat at around 100 degrees Centigrade so it shrinks the collagen, therefore sealing the vessel, versus cautery, which is right around 330 degrees, which basically burns the tissue. And you can see you essentially just paint the back of the knee here. We're going to do this later on in the procedure, and the areas that are key sources of bleeding are the perforated capsule, perforated meniscus, and certainly that posterolateral area where that genicular can hide.

00:33:02

KEITH R. BEREND, MD: And there's some pretty good evidence mounting right now with the newer -- with the new tissue link generator and new wand there that you're using that postoperative drop in hemoglobin is significantly less, patients have more vigor, there's less swelling and less pain, and that may be a very, very important part of this operation.

00:33:23

JEFFREY H. DeCLAIRE, MD: Yes. I call that the soft tissue component of minimally invasive knee surgery. You can do the most accurate and perfect procedure with a three or a four-inch incision, but if you get a large hemarthrosis, then everything is sort of lost. What we're going to do now is assess our balance. I put a spacer block in here. It feels pretty equal and balanced here. We've dropped an alignment rod, and I'm happy where our alignment or where our resection is with the tibia. Now I'm going to drop the knee into extension, and again, I'm happy with that alignment as well. Balance-wise this is a 10, so she may be around a 12, but we'll assess that later when we do our trial reduction.

00:34:07

KEITH R. BEREND, MD: That looks real good. So really your medial release you just accomplished on your exposure, and you're not thus far having to do anything different.

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JEFFREY H. DeCLAIRE, MD: Correctly. I do a I-- I do a very limited release at first depending on the patient's anatomy. She did not have a huge flexion contracture, so I did a very minimal release. Later on if we found that to be tight then I would go back and do a more extensive approach. What we're going to do now is prepare our tibia, and this is where I want to show you the Microplasty tibia. Again, you can see we're still in about 70 degrees of flexion. We've got excellent exposure here. Again, this is the typical exposure you'd see with the traditional approach. The preparation of this is with this instrument that has been designed to allow for a simple insertion. And as I'm going to show you here, there is a different shape to this component. Now, one key feature of this is this bevel in the back. You see back here, the posterolateral aspect is where many times there can be impingement. If there's impingement there, then this is going to rotate. And internal rotation is not going to be ideal, as we all now. So this low profile really helps to accommodate a more accurate placement of our tibial component here.

00:35:23

KEITH R. BEREND, MD: And especially true in the big, tight knee or in the obese patient. That's really where these things -- these specialized instruments and the specialized component really comes into play is making it just plain easier to do this part of the operation. What size do you got there?

00:35:43

JEFFREY H. DeCLAIRE, MD: This is a 63, and that might be -- you have to be a little careful because the medial aspect of the tibia as you can see here is wider than the lateral, so our size will be dictated by the lateral. So you don't want to, again, internally rotate to get coverage. We want to be here, so I'm looking at my lateral side. And let me see the rongeur just for a second. There's a little prominent bone here that I'm going to take out. Yet we want to get as much coverage as we can, but I don't want to -- now, see with my rotation I'm looking at we're impinging on the popliteus there, and I'm overhanging medially here, so I think -- And I think if I put it there, that's a little too much internal rotation. So we're going to go to the 63.

00:36:34

KEITH R. BEREND, MD: Looks like a 63. You might still have some osteophytes around the medial site, too, huh?

00:36:38

JEFFREY H. DeCLAIRE, MD: Yep, we do. So the pins are already present for fixation, and then here is our punch. You can see this punch has again been modified. It's shortened to 20 mm, it has a different shape. The key to this is to allow for a rotational insertion of the component without impinging on the distal femur, which has been sort of the struggle that

occurs with the more traditional components in that you have to extremely hyperflex the component -- or the knee in order to get that component to seat itself. Also, by rotation of the component we can extrude the cement from posterior to anterior, and that allows for that clearing of the cement to occur much more easily. Let me see the rongeur just for a second. And before we go any further, let me -- maybe I can demonstrate to you. Let me see the trial there. This is our trial component, and you can see the keel. The goal here is that we can insert this into the bone, initially set our keel with contact posteriorly. Cement will be extruded anteriorly, and it can rotate in.

00:37:57

KEITH R. BEREND, MD: And in a big tight knee you can sneak that down under the condyles without having that perfect exposure that requires you come straight down with the longer keel.

00:38:03

JEFFREY H. DeCLAIRE, MD: Exactly. The other method of insertion which I have done is you can do this in about 40 degrees of flexion, which relaxes the tissues and it falls right in. It's a little different than what we're accustomed to. Let me show you the difference here. Again, we're in 70 degrees of flexion. We're not hyperflexed. You can see what happens immediately is impingement into the distal lateral femoral condyle here, so what I would have to do is hyperflex this knee, sublux the tibia further in order to allow this component to drop in. You can see here we would be fighting. Now, again, what this can do, especially in an older patient with soft bone, is it could falsely internally rotate it even though you've made your keel, or it can toggle your component so that it goes in obliquely. And in soft bone if you're pounding that in, sometimes it will go in that direction. So the last step, again, we're doing a posterior stabilized knee. As you mentioned, one of the unique things about this system is the varying degrees of constraint. Cruciate-retained knees and posterior stabilized knees, and we've debated about that forever and ever, but I think as we all know one of the key things is accurate balance of flexion extension space that will give us a good knee. I think stability with the posterior cruciate ligament is the key, whether it's with a -- the patient's posterior cruciate or a substitute of one, I think the clinical success of both have been quite good. But the other thing I want to point out, that if the surgeon is a cruciate-retained knee and you feel that there is deficiency, then this is very easy to just take one more cutting block, and we're going to cut a very conservative amount of bone off of the distal femur here. Again, this has been redesigned, low profile, our fixation screws are right here rather than on the distal femur. It has a sizing guide here which allows me to see accurately where I would want to place this medially and laterally. And that looks good right there. So we're going to go ahead and pin this.

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KEITH R. BEREND, MD: So with these same instruments and the same knee system, again, you can go from CR flat all the way up to a constrained primary with really the simplicity of just this one jig or just changing the bearing.

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JEFFREY H. DeCLAIRE, MD: Exactly.

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KEITH R. BEREND, MD: You're using a little recip saw there. I usually use just a regular sag saw.

00:40:43

JEFFREY H. DeCLAIRE, MD: This, you could do it either way. It's also designed for a chisel, it can be used as a slot here, and that's really a surgeon's preference. But yeah, I think you made a great point there is, you know, everything else we have done is the same as if you were doing either cruciate-retained or a posterior-stabilized knee. My preference with posterior stabilized knee is, and I think this has been shown in some of the kinematic studies that there appears to be better rollback of the femur, greater degrees of range of motion. And one of the biggest things is late failure of the posterior cruciate ligament that

can create the posterior cruciate deficient total knee with associated flexion and stability.  
But again --

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KEITH R. BEREND, MD: Talk to me a little bit about that flexion and stability issue.

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JEFFREY H. DeCLAIRE, MD: Well, when the posterior cruciate ligament, if it's functioning, then everything works like it's expected. With the PCL fails or is disrupted, there is an increase in the flexion space of about 2 to 3 mm, so if there is failure or deficiency, there's two things that occur. One, you get abnormal laxity in flexion because of that increase in your flexion space. And those are the patients that will have chronic pain, they may have an ache, they may have effusions. They typically will have difficulties with stair climbing or getting out of a stair, going up or down stairs. And x-rays and everything can look just fine, but there's still these symptoms. And the way to assess this if you have patients like this is to have the knee hanging over the exam table in flexion and then -- and then examine the knee with the patient relaxed. Let's try the 10.

00:42:44

KEITH R. BEREND, MD: Yeah, I think that's an important point. I mean, the geometry of this knee is one of the -- the articulation is one of the most proven on the market with the Maxim Heritage and now the Vanguard. And it really seems like if you get this knee balanced in the OR, it's going to be balanced for a long, long time rather it's a CR or a PS. There's really no mid-flexion instability to any significant degree. Have you seen any?

00:43:09

JEFFREY H. DeCLAIRE, MD: No, none at all. I think that's been one of the key things, especially with the design. There's a one-to-one conformity of the coronal -- in the coronal plane of this component that gives greater contact and greater surface area, which creates that stability. We've implanted the 10 trial here, and we're going to assess our range of motion, and she does feel a little lax, and so what we're going to do is trial the 12 now. And then we're going to proceed and finish preparation of our --

00:43:44

KEITH R. BEREND, MD: Now, one of the things you said, Dr. DeClaire, and I thought it was interesting, is you said we're going to use a 63 so that we can rotate this to accommodate the fact that the lateral plateau's a little smaller than the medial plateau. Why not use an asymmetric base plate?

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JEFFREY H. DeCLAIRE, MD: Certainly that is an option, and there are systems that do have that, and an asymmetric base plate could be used that could accommodate that asymmetry of the anatomy.

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KEITH R. BEREND, MD: I think one of the interesting things about that is that the total knee designs -- the longevity of total knee designs have really not been associated with the shape of the tibial base plate, with the exception of sizing. As long as it's sized appropriately, and with this system having so many various sizes of base plate that can actually match with any size femoral component, so you can put the smallest tibia underneath the largest femur and still have excellent contact area with that one-to-one geometry, that you don't need to have that asymmetric base plate because you can increase the surface area, perhaps decrease the rate of loosening of the tibia as long as you've got it well-aligned. So I don't really see a need for an asymmetric base plate.

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JEFFREY H. DeCLAIRE, MD: Yeah, I don't. I agree with you. I don't think there's a need for it. I know there are some systems out there that have that, but I really don't think there's a need, as you have explained. What I want to show you here, we've just prepared our patella. We want to get as much surface coverage as we can, preserving, you know, the normal thickness. We've lateralized it to help tracking, but you can see this medial edge of

bone, and this is very common. You'll see this a lot. This can cause symptoms, it can impinge, and the way to address this is a simple, sometimes release here just underneath the osteophyte, and then just removing this I think is an important step.

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KEITH R. BEREND, MD: Yeah. You know, Merrill Ritter and his group had a study that showed that if that was contacting on a long-term outcome x-ray it didn't make much difference, but you know, that was a different day and age. Their average range of motion was 20 degrees less than what we're seeing now, the recovery was slower. I think that's an excellent point there, Dr. DeClaire. The other thing that I would comment on is, at least in my experience with this knee, my lateral release rate is well less than 1 percent.

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JEFFREY H. DeCLAIRE, MD: Yes, I would agree.

00:45:57

KEITH R. BEREND, MD: And it was upwards of 20% before -- before switching over because the patellar femoral mechanics are so much better with this than I think really any other knee on the market right now.

00:46:05

JEFFREY H. DeCLAIRE, MD: I would agree. And here we're assessing our range of motion and our patellar tracking, and that looks great.

00:46:12

KEITH R. BEREND, MD: And it's perfect. You even have the tourniquet up still, which, you know -- So what are you doing there? That's key.

00:46:18

JEFFREY H. DeCLAIRE, MD: This is -- we're assessing flexion stability or laxity. And take this out for a second. I use the bone hook -- I call it the bone hook test -- in the notch. When you hold the knee, when the surgeon holds the knee and the thigh, many times your hand that's holding the leg will be applying an axial-axle-axle -- I can't say that word.

00:46:39

KEITH R. BEREND, MD: Axially?

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JEFFREY H. DeCLAIRE, MD: Yes. Applying a load which can falsely give you a sense of stability. So as we place the hook in here and you pull, it's now free, I don't have to support it, and I can easily look at stability at 90 and 60 and then she takes it out full extension.

00:47:03

KEITH R. BEREND, MD: So you really -- you've assured that this knee doesn't have any mid-flexion instability. You've got a PS component in there. Could you do that test with the CR component as well, just hook it under the lip of the CR?

00:47:15

JEFFREY H. DeCLAIRE, MD: Yes, we do it on --

00:47:17

KEITH R. BEREND, MD: On everybody. That's a great look.

00:47:21

JEFFREY H. DeCLAIRE, MD: What we're going to do now is prepare the surfaces and go ahead and prepare for implantation and cementing.

00:47:28

KEITH R. BEREND, MD: While we're doing that I'm going to run through a couple more questions for you here while you're getting your cement ready and whatnot and getting your bone ready. What are you -- are you going to put lugs on the back of your femur, little spiky lugs? You didn't drill for any.

00:47:44

JEFFREY H. DeCLAIRE, MD: No.

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KEITH R. BEREND, MD: You're not going to put any -- do you think that's necessary?

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JEFFREY H. DeCLAIRE, MD: I don't think that's necessary, yes.

00:47:51

KEITH R. BEREND, MD: On the four-in-one block that you showed, that Elite block, the new block has the sliding guide anteriorly and posteriorly. I've used the Slidex four-in-one block. What are the advantages of this newer Elite block over the previous four-in-one Slidex type block?

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JEFFREY H. DeCLAIRE, MD: I think one of the advantages is it's fixed -- it's well-fixed with two pins on both sides. The other Slidex blocks is held on by just a sort of a press-fit of the pegs and it requires your assistant to also hold that block down, and many times the vibration will cause that to come loose, and that just doesn't happen with this. I think it's also lower profile. The other thing is you have to -- in resecting the anterior and posterior aspects, you can do it in all one motion, whereas with the other Slidex blocks, it's done separately. So a little easier to perform, I think potentially more accurate because the block is so well fixed to the femur.

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KEITH R. BEREND, MD: That's great. The -- you know, and I've said that I think especially somebody who's interested in cementless, whether it's a cementless CR or cementless PS, I think that may be a real benefit in having a little bit more stable block. I've not found it to be a problem with using cement, which we're mixing the cement here on the back table under a vacuum there. You're using a pre-colored cement, it looks like a blue cement.

00:49:29

JEFFREY H. DeCLAIRE, MD: Yes. This is cobalt. It's very easy to handle. It also has -- we're using antibiotics in our cement, again, to help minimize risk or the incidence of infection with this. And we do that routinely now.

00:49:52

KEITH R. BEREND, MD: Yes, and I've found with that blue cement, if you let it sit just for -- as she's doing, she's preparing the keel with some of it on the back there. And then really it's a high viscosity cement, pre-colored, very easy to use. It doesn't smear. You mix it in the bowl. You're fully cementing the keel, it looks like here, Dr. DeClaire. Is that --

00:50:14

JEFFREY H. DeCLAIRE, MD: Yes. I do cement the keel. I think, again, that's an important part of this. I think that's been shown not only in primary knees but revision knee that when you cement the keel that there is that added stability.

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KEITH R. BEREND, MD: And I would think with this short little keel that, you know, the advantage might be reduced if we didn't cement it. I think you probably need to cement that. So you're applying some cement to the back of the knee there. Now, what are you going to do for your bony preparation for cementation?

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JEFFREY H. DeCLAIRE, MD: What we've done is just with jet lavage we want to make sure we're getting rid of all the blood and debris. Maybe you saw it there, but we place the knee in full extension, which allows another view of that posterior compartment and that posterior capsule, which again I used the tissue length device as well as the cautery to again get added, or another attempt to control any bleeding that may occur. We then re-flex the knee and again prepared the bone here again, and now we're going to get ready to cement and implant. And what we'll do is try to pressurize this. She does have some osteoporotic bone here, so she is going to absorb this very nicely.

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KEITH R. BEREND, MD: And you can see, I mean, that's high-viscosity cement. It's in a relatively doughy state. Probably have plenty of working time.

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JEFFREY H. DeCLAIRE, MD: It's very easy. It doesn't really stick to your gloves like some of the others do, and that's worked out very nicely. Now, as we mentioned, what I like to do is engage posteriorly, and then we're going to try to extrude that cement towards the front. And then plant and impact our device. So it does minimize that cement extrusion. But again, you know, part of this component, it makes it easier for insertion, but it is as you can see absolutely necessary to get to this lateral and posterolateral aspect of the knee in order to be able to accurately remove all of this cement. And there we've just extruded a little more cement. Now, retractor management or retractor choreography, as I call it, is a critical step. What Paul is doing here is, it's not a tug-of-war, so once he relaxes on the posterior retractor here, we get better exposure laterally so she's not fighting herself.

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KEITH R. BEREND, MD: But you were able to sneak that tray under that lateral condyle. It's a perfect view of it right there. You didn't struggle at all

00:53:08

JEFFREY H. DeCLAIRE, MD: Yep. You can see right here that we would have had to hyperflex if we were using a more extended keel. Now, she's going to relax here, and you can see how we can get better exposure posteriorly.

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KEITH R. BEREND, MD: That cement seems to be cleaning up pretty well. It's not --

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JEFFREY H. DeCLAIRE, MD: Yep. Let's get that. Okay.

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KEITH R. BEREND, MD: Beautiful.

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JEFFREY H. DeCLAIRE, MD: Now we're going to go to the femoral side here.

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KEITH R. BEREND, MD: Now you -- this is a 64-year-old female. What do you tell this patient, or what do you tell the 50-year-old patient that comes in the office that needs a knee replacement and they say, as every patient does, and certainly it's the most important thing to the patient and their family, "How long will this last?" What do you tell them?

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JEFFREY H. DeCLAIRE, MD: I tell them our goal is that this is going to last them for the rest of their life. That's our goal. Then I proceed to tell them what our data is. And I think we do have data, certainly in the 15-year range, and now we're starting to see data in the 20-year range. And so I think there's that potential that we can get long-term success. Obviously the clinical data is one thing that we talk about, but then it's also all these technical aspects of it with appropriate alignment and balance. But I do think there's good long-term studies out there showing high success in that 20-year range that Dr. Ritter and others have reported on.

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KEITH R. BEREND, MD: You know, I've gone to telling people, they asked that and they certainly mean until it wears out as sort of the rest of the question. And you know, I think that with the implant designs the way they are now that very low incidence of stiffness, very low incidence of revision for instability, low incidence of any of the other complications as long as it's well-aligned and well-balanced, I think it leaves infection, femur fracture and long-term wear as the big, the big risks of revision. And I tell them they probably have a half-a-percent chance per year of ever having to need another surgery. So at 20 years there's a 90% chance that they're probably going to be doing fine.

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JEFFREY H. DeCLAIRE, MD: Yep.

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KEITH R. BEREND, MD: And hopefully that makes sense to them, but I think that's better than saying, "Oh, this knee's going to last 15 years," and then you're hanging crepe and

they come back and say, "I thought you said it would last 15 years," and you know, they got infected or something. So it's --

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JEFFREY H. DeCLAIRE, MD: Tibial trial. Yes, I think that's a great, great point that it certainly depends on all those factors. Yeah.

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KEITH R. BEREND, MD: So did you end up going with a 10 or a 12, or had you made that decision yet?

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JEFFREY H. DeCLAIRE, MD: We went with a 12 here. And we're just going to finish up clearing our cement. And now you can see, again, once we've kind of done all this, our patella can very easily be exposed and we can address.

00:56:07

KEITH R. BEREND, MD: Now, but you everted the patella there. Do you think doing that at this stage of the operation -- it doesn't look like there was any tension on it. You did it with two fingers.

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JEFFREY H. DeCLAIRE, MD: Yes. It's very --

00:56:15

KEITH R. BEREND, MD: Is that a bad thing to do?

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JEFFREY H. DeCLAIRE, MD: No, I don't think so at this stage. Now, I think there's a difference if you're doing as we were used to doing it in the past, where we evert it with a lot of tension and hyperflexion. But here, especially with all the cuts that we've made, it can very easily be everted, which is another point to make, that if the surgeon requires that knee to evert the patella, then after all the resections are made it can be resected at the end of the procedure in extension with eversion using instrumented methods as well.

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KEITH R. BEREND, MD: Now, if I'm a surgeon and I've been doing total knees for a long time, my patients have traditionally done well, it's one of the best operations that any person could possibly do to improve quality of life, why would I consider doing less invasive surgery? Are there any clinical benefits? Is there anything in the literature, is there any real evidence that we should be doing it through this approach?

00:57:14

JEFFREY H. DeCLAIRE, MD: Oh, yes, absolutely. There's no question that the early clinical results are significantly better compared to traditional method. In fact, we looked and reviewed our bilateral data, two knees done at the same time, where we compared patients who had a standard approach to our patients who had a minimally invasive approach. And this was a mixed group of patients that had either midvastus or subvastus. And with our traditional patients with standard medial arthrotomy eversion patella, roughly 87% of those patients would go to an inpatient facility after an average of about three days in the hospital. With the minimally invasive group it was the complete opposite. We found that 83% of our patients were being discharged home on an average of 3.2 days in the hospital. So now I tell my patients if we're doing bilateral with a minimally invasive approach that the majority of the time they're going to be going home rather than to a secondary healthcare facility.

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KEITH R. BEREND, MD: It makes a huge difference. You know, we looked at our series of a consecutive case control study that was published last year, and we saw the exact same thing. And interestingly, a lot of the studies have come out where the protocols have changed in terms of the rehabilitation. So they've taken not only a change in the surgery but also a change in the rehabilitation, the surgery anesthetic, the local anesthetic injection, which I'm sure you're going to use, done all of these things, the rapid recovery, and said, "Well, look. We've got them moving faster, they've got better motion." What we tried to do

in our study was isolate that factor of just the incision, and we used the same knee design, the same instruments, standard approach versus a small approach, and we saw a distinct, what I call a headstart. And it's just like anything else, if you get a headstart, you're more likely to win. And these patients have a headstart, their length of stay is less than two days in the hospital on average with, in that study, 25%. We're upwards of 50% of patients now going home in less than 24 hours. And that's something that we just couldn't achieve without rapid recovery techniques and without minimally invasive microplasty type techniques.

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JEFFREY H. DeCLAIRE, MD: Yeah, I think that's a key point. It's really a whole program, and what I like to emphasize is that the surgical technique is one part of the whole program. Certainly what we do here technically in minimizing soft tissue trauma, minimizing bleeding and swelling, is key, but like you just mentioned, a preoperative therapy program and educational program. So really, the rehab for our patients starts about two weeks before we do their surgery. What we do there is educate the patient on what they're going to be doing as far as their exercises, we start them on that program, they learn about the exercises. We will also improve their motion and improve their strength prior to surgery. So like you just mentioned, it's a headstart. You're a little further ahead in the process than if we didn't do that, and that's worked out tremendously. The second part is what we're doing here, which not only combines the surgical component but the anesthesia and the pain management protocols. Our --

01:00:30

KEITH R. BEREND, MD: Did I see you put a drain in there?

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JEFFREY H. DeCLAIRE, MD: Yes, we did.

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KEITH R. BEREND, MD: What's your -- give me your rationale on that.

01:00:36

JEFFREY H. DeCLAIRE, MD: This is a reinfusion drain so that really my thinking is that whatever I can do to minimize any intraarticular swelling or bleeding that I want to achieve that, and so that's kind of my thought on using a drain. I know there are people, and maybe you're one of those, Dr. Berends, that you don't use a drain or --

01:01:01

KEITH R. BEREND, MD: Well, you know, the interesting thing is with that tissue link technology, the data clearly shows that there is a reduction in the drop of hemoglobin, less postoperative pain and swelling, and I wonder if we can't get away from using a drain, although you're using a reinfusion drain. But you know, things like the tissue link or the GPS technology with the platelet growth factors, both of those have been shown to reduce the incidence of transfusion and pain.

01:01:26

JEFFREY H. DeCLAIRE, MD: Yeah. I think that's a great point you make because going forward, you're right, there's potentially as we move forward and get further data with regards to blood loss and hemoglobin drop that we may not need drains at all.

01:01:44

KEITH R. BEREND, MD: Now, you locked that poly in with that little locking mechanism, that locking bar, as it's called, in the front. You know, Jerry Eng's study years ago showed that this locking mechanism, which is taken from the Maxim mechanism, has the least amount of micromotion of any locking mechanism on the market. And that in combination with direct compression molded poly we've shown in a recent retrieval analysis far reduces the rate of backside wear, the severity of backside wear in a modular knee system. So it allows us to take the heritage and the long-term data that Merrill Ritter and Rick Worland and others have shown us with the direct compression molded AGC and adapt it to a modular knee

design like this, where we can go from a CR to a PS just with one single box cut. So that locking mechanism is really a critical part of this knee system, I think.

01:02:32

JEFFREY H. DeCLAIRE, MD: Yeah, I think you're right. I think it's the combination of both the locking mechanism and the direct compression molded polyethylene that's allowed for the great long-term success. And another point with that is this is the same locking mechanism that's used in revision with the SSK component, so that gives you another bit of feel for how secure and stable that is. Other systems on the market require much more elaborate fixation of polyethylene when you're doing revision knee surgery. Well, we're going to get ready to close. As we close here, we're going to put our initial suture in, and you can see this closure is much simpler. Do you have a ruler there? Here's where we made our midvastus approach.

01:03:20

KEITH R. BEREND, MD: And interestingly, you went up there with the tissue length there to establish your -- but it didn't tear, it -- look at the clean edges there. I mean, it's remarkable how little soft tissue damage there is other than where you made that actual resection.

01:03:32

JEFFREY H. DeCLAIRE, MD: Yeah. You can see we've just done the small arthrotomy and just this little split in the VMO, which we'll put some sutures in as well.

01:03:38

KEITH R. BEREND, MD: And you had fantastic exposure. I mean, that really --

01:03:41

JEFFREY H. DeCLAIRE, MD: And that -- again, I like to emphasize that, and certainly if you can't get this exposure based on the anatomy or the type of knee you're doing, then by all means it's very important to extend that exposure.

01:03:55

KEITH R. BEREND, MD: How about closure in flexion? Do you find that to be part of your rapid recovery?

01:03:56

JEFFREY H. DeCLAIRE, MD: Absolutely, and that's what I'm just getting ready to do here. I wanted to get that initial stitch in. But as you know, there's a great study by Roger Emerson. It showed that if we close in flexion, it will help our range of motion.

01:04:08

KEITH R. BEREND, MD: Now, I've had two questions emailed in to me, and apparently it's a hot topic right now. Both questions asked, and I'll get what your opinion is on this, and I'll share with mine, "What is the youngest age you can get or undergo a knee replacement?" This is the second time we've had that question.

01:04:26

JEFFREY H. DeCLAIRE, MD: Yep. The youngest patient I have done has been a patient in their late 30s. That was a -- and this goes back several years. It was an individual who had had close to 12 to 14 surgeries, young athlete when he originally injured his knee, and essentially had end-stage disease, chronic pain, on narcotics, out of work, and came in essentially begging, or asking and requesting a knee replacement. And I think obviously that's a challenging individual, but it's -- as you speak with patients like this, really their knee is appropriate. If you just look at the knee, then the knee is -- there's indications to do their replacement. Certainly with the data that we're seeing, hopefully these knees can provide long-term success, but it's a commitment. It's a commitment on the surgeon, a commitment on the patient to try to make this knee survive, which requires modification of their activities. But it's really the anatomy and physiology of the knee that you have to address, I think.

01:05:39

KEITH R. BEREND, MD: Yeah, and I agree completely. I think, as you mentioned right at the top of the webcast, the average age for knee replacement's going down, it's not going up. Baby boomer generation, younger arthritis, cumulative injury, and more people becoming aware of the long-term data. I mean, direct compression molded polyethylene, better than 95% success at 20 years. You know, I think that information gives us some comfort in performing knee replacements on younger and younger patients. Just like I said earlier, the thing that worries me more in a younger patient is their long-term risk of infection or periprosthetic fracture. You know, I'm not as concerned about loosening and lysis and where as perhaps we used to be 10 or 15 years ago because now we have the data to support what we're doing. I see patients routinely in their 40s, probably the majority of patients are in their 50s, and then the older patients after that, and occasionally a patient in their 30s that's in that same scenario that you just mentioned.

01:06:36

JEFFREY H. DeCLAIRE, MD: Yeah, those are great points. And you know, the other part of it that I see and I think patients are starting to recognize is, you know, the only other option for a young individual with end-stage disease is to modify his activities significantly, which not only means changing his lifestyle, but it means not being active and getting the exercise and the things we need to stay healthy. We now know that in order to maintain blood pressure, cholesterol, weight gain, that an exercise program is critical. So indirectly, it's really factors into their whole general health and well-being.

01:07:14

KEITH R. BEREND, MD: It absolutely does. Well, we're finishing up our closure here. Dr. DeClaire and the operative team here, I want to congratulate you on an outstanding operation and surgical experience. And I'm certain that I speak for all of the people joining us on the webcast and those that'll join us in the future. This is extremely education and very, very valuable information, and we want to congratulate you and thank you for your expertise that you've shared with us tonight and congratulate the whole team and thank everyone here in Rochester for their participation, and specifically thank this patient for allowing us to take part in her first step in her recovery.

01:07:54

JEFFREY H. DeCLAIRE, MD: Well, thank you, Dr. Berend. And I'd like to just ditto that. I think it's good to demonstrate these techniques, and I would also like to thank everybody for their participation and thank the audience for being with us here tonight, and I hope we've shared some good, valuable information for you.

01:08:18

ANNOUNCER: Thank you for joining us for a minimally invasive primary total knee arthroplasty featuring the Vanguard Complete Knee System, Microplasty Elite Instrumentation, and the Biomet Microplasty Tibial Tray from Biomet Orthopedics, Inc. Biomet, as the manufacturer of orthopedic products, does not practice medicine and does not recommend the specific implants or instruments herein for use on any specific patient. The surgical techniques shown herein are utilized by the surgeons herein for general educational purposes.

01:09:01

[end of webcast]