

**NEW KNEE REVISION PROCEDURE (DePUY)  
SHADYSIDE HOSPITAL, UNIVERSITY OF PITTSBURGH MEDICAL CENTER  
PITTSBURGH, PA  
December 6, 2007**

00:00:16

ANNOUNCER: Welcome to UPMC Shadyside Hospital in Pittsburgh, Pennsylvania. Over the next hour, watch Lawrence S. Crossett, MD, demonstrate the DePuy Orthopedics LCS complete mobile-bearing knee system during a revision knee replacement procedure. Today's webcast will be moderated by James E. Dowd, MD, assistant professor of orthopedic surgery, Eastern Virginia Medical School, and director of clinical research, Jordan Young Institute, Virginia Beach, Virginia. During today's event, viewers can send e-mails to the presenters by using the MDirectAccess button on your webcast screen. Now your host, Dr. James E. Dowd.

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JAMES E. DOWD, MD, FAAOS: Welcome to the University of Pittsburgh Medical Center in Shadyside Hospital. We're here today for our webcast of mobile-bearing technology and revision knee replacement. I'm joined here in the operating room with my colleague, Brian Haas, from Denver, Colorado, and we're here today joining our host, Larry, Crossett, from the University of Pittsburgh Medical Center, who's in the operating room now, underway with our first case. Larry, can you hear us?

00:01:22

LAWRENCE S. CROSSETT, MD: I can, Jim, hear you real well.

00:01:24

JAMES E. DOWD, MD, FAAOS: Okay, you were saying that this -- we're joining you a little bit underway with the exposure already, and you were saying this is a second-stage reimplantation for a previously infected total knee replacement?

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LAWRENCE S. CROSSETT, MD: Yeah, what -- yeah, we have one hour, so we really want to spend more time on the revision part of this. We've done the exposure, I'll get to that in a minute. The patient's a relatively young woman who about two years ago had a patella femur arthroplasty, did poorly: pain, drainage, and conversion to a total knee. You know, eventually that removed and had a coag-negative staph infection, had multiple other organisms that had been retrieved multiple times, mostly from drainage. So she came to me several months ago with this long saga, it's gone on for about two years. And with this sort of history of prolonged microbial infection, I was pretty pessimistic. So we took her back, took a block out, debrided pretty aggressively. Cultures came back coag-negative staph resistant, which I would expect and then later came out with a diphtheroid, which -- so we treated both of them, and about a month ago or a little bit more, I went back and re-debrided her. You know, again, sort of laying the brickwork for doing a -- doing a fusion. And the cultures were negative, her...sed rate had trended down significantly, her nutritional status has actually has come back to normal, which is a real surprise. She looks much better, she feels much better, so it's probably reasonable to put this in at this time. And again, this has gone on for two years, and I don't think we're

going to get any better, so that's where we are. The exposure -- you know, and it's a big exposure.

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JAMES E. DOWD, MD, FAAOS: Looks like you got the block out already and mobilized the tissue a little bit there.

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LAWRENCE S. CROSSETT, MD: Yeah, we got the block out. And that's the whole -- the whole issue here is mobilizing this and getting your exposure. I don't like -- and on a primary, I'd never want to take the MCL down this degree, but you can take it down this way or you can let it rip by forcing your exposure, but you need to see the whole thing, and a nice way -- I used to work just on the tibia side when I exposed the tibia, but now sort of early on, what I'll do is when I get trouble getting back here in the corner, I'll expose the femur. I'll make sure that I see circumferentially every centimeter of this femur. And I get -- you know, you can see every part of femur I've exposed.

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JAMES E. DOWD, MD, FAAOS: Yeah, looks great. Makes you a little nervous, digging around back there. But you can free up the back edge of the femur and the posterior capsule, there's a lot of scarring and --

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LAWRENCE S. CROSSETT, MD: But you get that stuff out, and so now our exposure's not an issue. So and as you said, we're -- this is going to be a -- a rotating platform revision, which is a little bit interesting, a little bit of a challenge. We've been doing them -- Brian's been doing them for a while, I've been doing them for about four years now, very enamored with the technology. I'm going to let you guys discuss the whole issues of the advantages of rotating platform. We're going to start reaming. The tibia again is a modular system, so it's like the S-ROM. You know, we're going to have a sleeve, we're going to have a stem, we're going to have a surface. So I'm going to go ahead and start reaming, get a good idea about that, start doing our sleeves. You guys can go ahead and do your thing.

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JAMES E. DOWD, MD, FAAOS: Brian, you've been doing mobile-bearing revisions now for quite a while, too. I know that you're happy with them. What do you think the strongest advantages are?

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BRIAN D. HAAS, MD: Well, it's been my experience in the past that the issues of using a constrained implant have really led to some issues, as you know. The thing is is that we've looked at our lab, at the Rocky Mountain Lab, and looking at rotational forces on some of these constrained implants have really been out of the box and we've seen broken implants. I know you've probably revised some for the same. So I think the key here is we're decoupling the rotational constraint forces with the implant. Also, we're lessening the implant forces at the bone cement or bone prosthetic interface in these cases.

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JAMES E. DOWD, MD, FAAOS: And that certainly makes a lot of sense, given when you're looking at bone like Larry's looking at: the quality's down, it's a lot of sclerotic bone, you're not getting interdigitation of the cement mantle fixation, certainly is not a given, as it is in the primary.

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BRIAN D. HAAS, MD: The other issue is, as Larry's preparing the sleeve here on your screen today, the use of these sleeves has really reopened the concept of almost a cementless revision, which for those of us that have been doing revisions for a long period of time, we'd really like to get away from the days when we used very long

cemented stems in filling up the canals with a lot of cement. These metaphyseal sleeves, once you get used to using them, they really have been a profound addition, especially in a case such as we're doing today, where the question of long-term infection arises, not dumping a long-stem cemented construct in there that potentially would have to be removed in the future if the infection reoccurs is really, in my opinion, a real plus.

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JAMES E. DOWD, MD, FAAOS: Larry, are you sounding the canal there with a reamer to get a depth or a size?

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LAWRENCE S. CROSSETT, MD: You know, I like to keep it to 14. If I get ingrowth in my sleeve two years from now and get a hematogenous infection to this knee, I want to be -- just like an S-ROM hip, I want to be able to come in, bang this tray out with the sleeve, leave the sleeve behind -- I mean, the tray with the stem -- leave the sleeve behind, take that out separately. So I stop at 14. If I don't get a good bite at 14 by 75, I'll go long at one 15. That's been a problem.

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JAMES E. DOWD, MD, FAAOS: Fourteen being the largest diameter that'll pass back through the opening of the sleeve.

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LAWRENCE S. CROSSETT, MD: Exactly. The other thing, Brian, just to mention these advantages. You know, again, the number two reasons for failure in this country are wear and tibial loosening. And we know quite well the advantages wear reduction with a uni-directional rotating platform, that's not, you know, opinion, that's science. And we also know the dramatic reduction and loosening forces, torque forces on a tibia, so you know, if you really believe in this whole low-contact-stress arthroplasty thing, which I do, and you guys do also, you know, why not extend it to the clinically compromised person? Now, getting back to these sleeves, you know, I'm going to broach the sleeve so I get a really solid fit, and that's an incredible thing, doing these revisions. You're just not going to understand the kind of fixation you're having with your implants early on. Now, one of the things I do personally is I will set -- I will place my sleeve, rotate it to the same rotation that I plan on putting on my component. The reason being is I've cracked two tibias in 200 of these revisions, the only ones I've done it in is when I did not put the rotation of the sleeve in the same rotation of the implant, and I try to jam it in, so --

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JAMES E. DOWD, MD, FAAOS: So you'll show us that with the trial, but your point there is the sleeve can be rotated different than the prosthesis and it's just easier for you to know if you line them both up together.

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LAWRENCE S. CROSSETT, MD: You could rotate it 20 degrees either way, but from my experience is --

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JAMES E. DOWD, MD, FAAOS: You just like to keep them straight forward.

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LAWRENCE S. CROSSETT, MD: So I'm looking at my tubercle, I'm looking at this, and I'm going to put this right in here. Now, this is a 37, and I'm thinking I probably should've stopped, but that's down past there, and --

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JAMES E. DOWD, MD, FAAOS: So what do you think about the position of how you're going to rotate the sleeve and the prosthesis? Got any pearls for that?

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LAWRENCE S. CROSSETT, MD: I'm going to put this sleeve in the -- well, you know, I'm sort of going to go with the medial third of the tubercle, that's sort of my general rule, because this is a rotating platform knee, it doesn't -- it's not that big a deal.

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JAMES E. DOWD, MD, FAAOS: You can kind of go where the best cortical fit is and where the best coverage is.

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LAWRENCE S. CROSSETT, MD: And if you look at this, you know, I've got the same amount of bone all the way around the front. The vast majority of times, you know, it just so happens that the best fit happens to be in the medial third of the tubercle.

Probably no accident.

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JAMES E. DOWD, MD, FAAOS: Right, the symmetry there.

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LAWRENCE S. CROSSETT, MD: Okay, so I think I have a 45-millimeter sleeve in here, and I'm beating the bejeebes out of it to get it down. So I want to get it down so maybe I can cut a little bone off of here.

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BRIAN D. HAAS, MD: Yeah, that's a great point, that using the stem and broach system as it is, you're able to cut the top of the tibia now without struggling to put a big jig or anything on the -- on the front of the tibia, which is very hard in a lot of cases as you're battling the patellar tendon complex. So he's just going to use the top of that broach. And the other thing is this really does -- I'm sure he's going to check his alignment at some point, but it's been my experience using this system that my alignment has always been dead-on using the combination of the stem and the sleeve. It's been very difficult to put this in either excessive varus or valgus.

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LAWRENCE S. CROSSETT, MD: Yeah, I agree with that.

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JAMES E. DOWD, MD, FAAOS: I also think if you want to correct the alignment, you know, in contrast to a long stem that goes far down the tibia and sort of is directed by the diaphysis, I've found that I'm able to change position of the sleeve and broach a little bit more in valgus or a little bit more in varus to correct any alignment issues that I want to get to.

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BRIAN D. HAAS, MD: The other thing that this is allowed me to do in my patients has been to put shorter stems in this because you get such good proximal metaphyseal fixation that you don't have to try to struggle and put down those very long tibial stems, which in a lot of patients that have a little tibia valga can be really hard.

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LAWRENCE S. CROSSETT, MD: Well, Brian, then the question that people have asked me is, you know, are we ready to go to stemless revisions with just sleeves?

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BRIAN D. HAAS, MD: I've done that in a number of cases.

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LAWRENCE S. CROSSETT, MD: I have, too, but what's your gestalt? You think it's -- you think the -- I'm not convinced I can do that, and if I don't get a good fit with a 14, you know, 14-75 is the workhorse, but if I don't have a good fit, I go to the one 15 now, and the whole thing of this stem pain is like zero, because again you're getting all your transmission of your forces up above.

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BRIAN D. HAAS, MD: Well, I don't hesitate -- I'm in a little contrarian to you. I don't hesitate to use a larger stem because you can actually, with a high-speed burr,

dissociate the stem from the sleeve because the threaded complex goes up through the sleeve itself. So even if you did have an 18 or a 20 stem distally, if you had to, you could go in with a high-speed burr and dissociate that.

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LAWRENCE S. CROSSETT, MD: Yeah, I agree there. Now, okay, we've gone with a size three tibia, 45-millimeter sleeve, 14 by 75 stem extension. We've been on the air for ten minutes and the tibia's done. And I don't know if you can see that in there. Can we bring the camera in?

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JAMES E. DOWD, MD, FAAOS: Yeah, but I think the hard thing for the audience to appreciate is just how solidly you're hitting that thing to seat it and how rock-stable that is. That's the kind of thing where you've really got to do it or a learning center to really appreciate how solidly these things fix in the mecapsial (sp?) bone.

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LAWRENCE S. CROSSETT, MD: You know, I put a fully -- a fully in --

JAMES E. DOWD, MD, FAAOS: That looks great.

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LAWRENCE S. CROSSETT, MD: A fully coated hip in and we hit this every bit as hard as I do to get those stems in, so I mean, this is a no-brainer.

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JAMES E. DOWD, MD, FAAOS: And then when you struggle to get the trial back out and you realize how well it's fixed, you know, you're used to the trial sort of rattling around in the diaphyseal stem.

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BRIAN D. HAAS, MD: And then the other -- the other thing with this, you see that Larry has rotated that to optimize his peripheral cortical contact with the tibia component, and he doesn't have to worry with his rotational aspect of where he's put that tibial component because of the mobility of the bearing. It's going to self-align. And so this -- especially in some of the harder revisions that we've done, we've been able to cover the tibia appropriately independent of what the rotation of the femur, what the constrained poly's going to be.

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LAWRENCE S. CROSSETT, MD: All right, I don't want to keep interrupting you guys, but this gap measurement is sort of the key to everything I do. This is a 20-millimeter block. Now, it's sitting on a 4-millimeter tray, so I've got about a 25-millimeter space here, so you know, what I'm thinking about right now is I want to know the difference between flex and extension. I want to control my flexion gap. My primary goal is augment posteriorly in the femur. We'll talk about that extensively. I have the ability to use a thicker tray. I've got 15-millimeter and 25-millimeter thick trays, I have those options. So you know, I'm starting to think about all these things now. This is a 20-millimeter block with a 25 space. That's pretty tight, it's a little looser laterally. Now, if I go into extension here, I've got about a 20-degree flexion contraction. If I go from 20 to 10 --

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JAMES E. DOWD, MD, FAAOS: You've given yourself a nice stable tibial platform to go for, right? And you are interested in how your flexion and extension gap measure up relative to one another, not so much the ultimate size, but how they compare, is that fair to say?

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LAWRENCE S. CROSSETT, MD: Yeah, Jim, I'm paying attention to -- yeah, the first thing is the difference. Because my goal -- I'm a gap-balancer, I'm more controlled -- I'm more concerned about balancing my flexion gap, controlling my flexion gap, getting my joint line inflexion. Whatever -- if I can't get it -- my joint line inflexion

correct because I can't augment enough by our limitations, that's how much I'm going to raise the joint line. So right now, you know, with a 10-millimeter block in extension, she comes to full extension, and the rule is it's always looser in flexion and tighter in extension than you think, so right now I think I've got about a 10-millimeter difference, so I would like to -- whatever I do on my femur -- to augment 10 millimeters posteriorly, augment nothing distally, and that'll leave me with a 12.5 or so, you know, poly.

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JAMES E. DOWD, MD, FAAOS: And if you don't augment 10 posteriorly, you'll have a 20 poly and you'll have to resect distal femur and end up elevating the joint line and then the mid-flexion instability.

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LAWRENCE S. CROSSETT, MD: I'm sorry, Jim, repeat that, I had to think here for a minute.

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JAMES E. DOWD, MD, FAAOS: Well, your concept is you're very focused on closing down the flexion gap, which you said was roughly 25 millimeters. If you don't do that, you'll end up with a big, say, 25 millimeter poly in flexion and you'll have to resect distal femur to get it out into full extension.

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LAWRENCE S. CROSSETT, MD: Or what more people are doing is, okay, they'll -- you know, it's 20 in flexion and 10 in extension, so you put 15 in, so it's tight in extension, which they hate, it's loose in flexion. You end up with a lot of constrained poly. You know, we will be -- rare, rare, rare do we use constrained poly. Now, let me just say something. We talked about this flexion gap, controlling the flexion gap. You know, for years and years, I did, you know, I sort of didn't think and I reamed, and you weren't paying attention, and by nature, we tend to lift up when we're reaming this.

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JAMES E. DOWD, MD, FAAOS: Sure, the bow of the femur takes you that direction as well.

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LAWRENCE S. CROSSETT, MD: Well, the dia-- when you get into the diaphysis, it's going to be interior. Now, that's a mistake. What you want to do here is ream against the post-- can you see in here? I'm sorry, can you bring that camera up? I mean, there's my notch right here, okay? Look where I --

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JAMES E. DOWD, MD, FAAOS: So you're staying very posterior against the back cortex.

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LAWRENCE S. CROSSETT, MD: That's right. I'm medial and I'm posterior. All right, that's where I want to be. Now, and I don't -- people say, "well, gee, your flexion component." No, I rather think I'm respecting the distal bow of the femur. But here's the math: if you have 120-millimeter stem, you've got a component, you've got a sleeve, you've got a stem. Let's just use 120 millimeters. If you flex it five degrees compared to what you would do if you went up into the diaphysis. If we go up in the diaphysis, we're way interior. If you flex it five degrees from this diaphyseal filling line, which is way interior, you're able to augment posteriorly 7.8 millimeters. Basically all your augmentation, you're losing by not reaming posteriorly. If you don't pay attention to this, you wonder why you can't control your flexion gap, because you've not reamed posteriorly. And it's changed dramatically. You know, two years ago, 45-50% of our knees had augments. Now 88% have bilateral posterior augments, and we're getting a much better knee from it.

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JAMES E. DOWD, MD, FAAOS: So, Larry, a question came in off the internet early on when we mentioned we were doing a mobile-bearing revision, you know, obviously the revision situation a little more complicated, what about worrying about the spin out? How do you think this plays into controlling the flexion extension gap and what you don't see or don't see in spin out in a revision situation?

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LAWRENCE S. CROSSETT, MD: Well, you know what, my opinion on spin out on a primary rotating platform is absurd. This is not an issue. Spin out is just, you know, something people talk about. You know, I've done -- you know, my first thousand rotating platform knees, I had less dislocations than I did my last thousand fixed bearings, and most had to do with my change in valgus knees, from going to -- going to a lateral approach. But the whole spin out thing is -- is really not an issue.

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JAMES E. DOWD, MD, FAAOS: Brian, you got any thoughts on that?

LAWRENCE S. CROSSETT, MD: Now, it's posterior stabilized. We're posterior stabilizing this. What's your issue of spin out with an EPS knee?

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BRIAN D. HAAS, MD: Well, Larry, you're right. The incidence of spin out, we've looked at our first 200 revision mobile-bearing, and we have not had a spin out in Denver at my institution. And when you really talk to the guys that are doing posterior-stabilized rotating bearings for primaries, the incidence of spin out has been miniscule if anything. So I really think that -- but the premise, though, is that you do have to pay attention to your flexion extension gaps during the procedure.

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JAMES E. DOWD, MD, FAAOS: Yeah, that's really the point that I was trying to bring out is that the concept of how your flexion gap and your extension gap measure out at the beginning of the surgery and maybe some rudimentary math on how you're going to get those equal with posterior augments and distal femoral joint levels can be sort of novel to some people. And it's concentration on getting those two close that I think really gives you great range of motion and more stability that I've seen in my practice.

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LAWRENCE S. CROSSETT, MD: Now, I am going to put a femoral sleeve on her. This is kind of controversial. You know, the whole issue of femoral sleeves, on the tibia, is a no-brainer, you know? Every one of these tibias we take out has a central stem, has got a defect. And Brian, when we were at the meetings, when we were going through the design of these things, and sort of toward the end, they'd say, "hey, by the way, we're going to take the S-ROM sleeves and we're going to put it on the system," we looked at each other and said, "yeah, so what?" And you know, a month later we're putting it in everything because we like it so much. Now in the femoral side, it's a little more work. I'm going to show you how there's a little more thought that goes into it, but you know what, I think on revisions, it's probably more important on the femoral side. I think my failed revisions are on the femoral side. And you think about it, in extension, your stem works good for varus/valgus constraint, but if you're at nine degrees of flexion here, what is your rotational constraint? And that -- it's zero. You know, it's the little crappy cement you've got in the back of your condyle. So I think a sleeve is critically important. So what I'm doing here is I'm just -- I'm taking the time to measure this because I always just do, and so we've got more than enough length here for this -- for a sleeve. Now the next thing is, you know, I ream posterior. Now, I've got to make sure this thing is rock-solid because I'm going to do this just like I do my primary knees. You know, I'm going to -- my -- when I'm in extension's okay, I'm going to use my soft tissue

to set my rectangle. So I want this rock-solid. So it is. And it is a -- it's a 16, so Art, give me a 16. What I'm going to do is a 16 reamer here, and I'm going to put an 18 sleeve up here. So I'm going to really make sure this thing's tight, because it's really important.

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JAMES E. DOWD, MD, FAAOS: And again, you've stayed posterior with all those reamers. You do all your reaming by hand?

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LAWRENCE S. CROSSETT, MD: Yeah. I -- you know, that's just something I've just done for a long time, Jim. It's just... All right, now this is 18, Art? Sixteen with an 18 sleeve. Let's see if that's -- let me have a 22.

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BRIAN D. HAAS, MD: I think the key here, though, is by staying posterior, what that really does to you long-term is it also, once you get your construct in, you'll notice that your trochlear flange is flush to your anterior portion of the femur.

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LAWRENCE S. CROSSETT, MD: Yeah, and what I'm doing this for is -- I'm sorry, Art, let me go with a 20. What I'm doing this for is I don't want to -- you know, all that work I did to put my reamer in the right spot, now I don't want to put this in, lift it up, so let's just --

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BRIAN D. HAAS, MD: Well, and the trouble is, this case you actually have some anterior bone there, but in the majority of revisions, your anterior femur is so stress-shielded that that bone is of so poor a quality that you really can't do what you're going to do next, which is really try to assess your flexion gap.

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LAWRENCE S. CROSSETT, MD: So you saw what we did here, okay, right?

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JAMES E. DOWD, MD, FAAOS: Yeah, that looks nice and solid.

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LAWRENCE S. CROSSETT, MD: So we templated a standard plus for this woman, so I'm going to slide this in a plus cutting block here, okay? And just like -- you know, again, I'm a big, big believer in this whole type of philosophy here. I'm going to put this, my femoral positioner, in just like I would for my primary knees. And can we get a look in here? If we get a light in there... Better? Okay, so let's move it up here and let's take a look. That's pretty darn loose, isn't it?

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JAMES E. DOWD, MD, FAAOS: Yeah.

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LAWRENCE S. CROSSETT, MD: So we said this was going to be a 20, didn't we, so I guess that's not too smart of me. Let me have another 10.

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JAMES E. DOWD, MD, FAAOS: So for the uninitiated, you're using that gold piece to lock your femoral rotation parallel to your tibial base plate?

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LAWRENCE S. CROSSETT, MD: Correct. I want a rectangle.

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JAMES E. DOWD, MD, FAAOS: So that's ensuring you the square flexion gap, or rectangular flexion gap.

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LAWRENCE S. CROSSETT, MD: That is absolutely correct.

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JAMES E. DOWD, MD, FAAOS: And you're paying a little bit of attention to make sure that lifting up on the femur isn't anteriorizing your reamer shaft?

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LAWRENCE S. CROSSETT, MD: Well, you know, I'm --

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JAMES E. DOWD, MD, FAAOS: She's got pretty good bone, but...

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LAWRENCE S. CROSSETT, MD: Let's hold this up here.

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BRIAN D. HAAS, MD: I think the issue, though, is as you get your positioner in position there, is what -- you know, the premise of the no-spin-out question is is that you really want to make it rotational.

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LAWRENCE S. CROSSETT, MD: We're locked in solid there. Okay, let's have a drill.

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JAMES E. DOWD, MD, FAAOS: Yeah, looks a lot better.

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BRIAN D. HAAS, MD: So now he's set his femoral rotation based on making a rectangle of his flexion gap, and that is the real key to preventing spin out is making a symmetrically balanced flexion gap. And Jim, I know -- I've seen you operate, I know -- people in the audience, we are firmly committed to balancing flexion before extension in any revision arthroplasty.

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JAMES E. DOWD, MD, FAAOS: Well, I mean, I just think the variables that are under your control when you're paying attention to the flexion gap at this point, you know, are so -- you've got so many more under your control. I mean, Larry's thinking about the size of his prosthesis, he's thinking about staying posterior on the cortex, he's thinking about posterior augments, he's done the math between a 25 and a 15 flexion and extension space, he knows he wants 10 posterior augments. You know, at that point your main goal is to get control and stabilize the flexion gap and then you'll see where you are in extension. Most of the time, that will keep you from arbitrarily elevating the joint line, which I think is sort of a common mistake where people get into instability issues.

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BRIAN D. HAAS, MD: So as Larry's cutting his posterior area here, we'll let him concentrate. There was a question from the audience about size and trying to determine what's bony deficiency and how to balance your flexion. I think the premise that I always use with balancing your flexion gap is there is a rare occasion where I'll accept some medial lateral overhang for a larger femoral prosthesis if I really have an inordinately large flexion gap, but what I think Larry is emphasizing is he's trying to get his femoral component as far posterior as possible.

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LAWRENCE S. CROSSETT, MD: Well, if we notice -- I mean, people out there do a lot of revisions, and a lot of time, this anterior cut's a joke, you don't hit anything. But you notice, I mean, I did skim bone, which I'm happy about. Now, what I'm not happy about is on the medial side there, you know, I hit bone at five and I just got a little bone here at ten, and I wanted ten and ten. So I think I'm going to be stuck in between, I'm not going to get the full ten. I remember saying when we put the block in that it was a little looser lateral. So I'm getting a ten here and five here, so --

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BRIAN D. HAAS, MD: Would you just cut that and see how things work out at this point, then? Or are you going to go away and sacrifice bone and try to put in a ten and a ten?

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LAWRENCE S. CROSSETT, MD: No, there's no reason. When I trim the five, I'm hitting bone. I do want my prosthesis on bone, I really don't want to have, you know, a bunch of glob-- [ unclear ] on some fibrous tissue back there. I've done that and that's a mistake. Now, remember, we did the flexion balancing, so I'm going to go right to my extension now, and I'm concerned -- again, I'm thinking ahead, thinking, you know, I've got five and ten posteriorly, my flexion gap's not as big as I want, my extension gap's going to be a little tighter. That's my concern right now. So we're going to -- pin puller, Art. Thank you. All right, so we slide that right back down where it belongs. Let's see the saw. And we'll leave that reamer in there the entire time. Now, we're only about five minutes from here from getting ready to put implants in. That's a zero cut. This might come in handy.

00:26:32

JAMES E. DOWD, MD, FAAOS: Is that the five cut?

00:26:34

LAWRENCE S. CROSSETT, MD: That's a five, then we took off, what, a millimeter. I think -- you know, on this side, I'm okay. that's a zero. So you know, I'm -- between you and me, if we didn't have an audience here, I'd say, "gee, I might cut five on the lateral side and just make it easy to get full extension. So we'll probably come back to that later and look like an idiot, but you know, I get to be a purist about all this stuff. Okay, so anyway, what we've done now, we've got distal, we've got posterior, and I'm already thinking I'm going to be a little tight in extension, that's going to haunt me. So we'll put -- now we've got this little device here, I'm going to put all my augments on this. I want a five and ten posteriorly, Art. Okay, so it's five medial here, it's ten lateral, and I want a five distal medial. Thank you. So now I'm going to have this rock-solid little construct here. Now everybody should be thinking, "well, yeah, but when's he going to put a sleeve in?" And we're going to talk about that in a minute. But I could probably start talking about it now, since this isn't a very important -- this is not very important here.

00:27:41

BRIAN D. HAAS, MD: Now this is -- you're just -- you're doing a little carpentry here on taking your --

00:27:46

LAWRENCE S. CROSSETT, MD: Okay, there's a couple philosophies about these sleeves. I'm kind of fascinated by them. And again, I -- my learning experience with sleeves was: go do them and tell us what happens, because no one else has been doing them other than Dickie Jones, and I didn't know Dickie very well back then. Fortunately, I do now, and he's helped me out a lot. But so my thought was, being a gap balancer, let's -- let's get everything balanced, because -- and then put the sleeves in later, which I'm going to do. Now, there's a whole lot of people out there saying, "no way." You know, when I was reaming and saying I need to have this absolutely rigid reamer, you know, Jim was saying, well, gee, put a frigging sleeve in there and you have a rigid reamer. Now, here's the issue. There's two issues: if you put your sleeve in first, early on, and a lot of people say -- they say, "I'm going to put it so it sets my joint line 2.5 centimeters down from my epicondyle access neatly, that's going to be my joint line." That's all well and good. you're going to have trouble matching that in flexion. You're going to have a loose flexion gap and you're going to end up putting a lot of constrained polys in for flexion stability, and that's what the experience has been. The other issue is you don't know rotation yet. Now you can rotate those things any way you want, but when you put your components in, they better be rotated exactly like your trial. When we get to this, I'm going to rotate it parallel to my cut surface so I get -- it's easy to put together.

It's two different philosophies. I'm not sure which is right. I mean, I like to think I'm right here, but there's no --

00:29:17

JAMES E. DOWD, MD, FAAOS: You do like to think that.

00:29:21

LAWRENCE S. CROSSETT, MD: Well, and you know, years of practice has convinced me that usually it is, but you know... But the --

00:29:28

JAMES E. DOWD, MD, FAAOS: No, I mean, I think the point though, the stable --

00:29:29

LAWRENCE S. CROSSETT, MD: Life would be easy, putting your sleeve in first. I just don't trust it. I don't believe in it because that's my philosophy.

00:29:36

JAMES E. DOWD, MD, FAAOS: Because your greatest concern is you wouldn't want to have to augment your distal femur and lift the sleeve out of its nicely broached bed.

00:29:44

LAWRENCE S. CROSSETT, MD: If you're doing a primary knee, you know, is tight in extension, loose in flexion good? I mean, that's the bane of existence for most total knee replacements. So you know, Jim, it's just all philosophy, but I want to recognize people out there who might feel strongly the other way, they want to set their joint line. You can do it.

00:30:04

JAMES E. DOWD, MD, FAAOS: Well, I mean I think the point that I've heard brought up in both sides of the argument is you want to stay posterior and you want control of the platform you're using to set your jigs on. And whether you do it with a very tight reamer handle or you do it with a sleeve, you want, you know, good position, you want to control position of your cutting blocks, and you want it to be stable.

00:30:24

LAWRENCE S. CROSSETT, MD: Could we come up from down here for a minute?

00:30:27

BRIAN D. HAAS, MD: Larry, I think the reason --

00:30:28

LAWRENCE S. CROSSETT, MD: Let me show something here. Let me show something real quick. You know, I talk about -- and for me, you know, the only time I've cracked things putting them in is when my rotation of my sleeve and my real components are different from the rotation of the sleeve I put in for the trial. So again, here's -- I cut this. This is my rotation of my component. See this flat surface here on this, I want those parallel. Okay? So go ahead and talk.

00:30:51

JAMES E. DOWD, MD, FAAOS: Just because it's easy to see when you set up the -- the final component, right? It's just a nice landmark to go off of.

00:30:56

LAWRENCE S. CROSSETT, MD: Yeah, you're dealing with me, you better keep it simple.

00:31:00

BRIAN D. HAAS, MD: Well, I think the other thing you've done here with broaching at this point is you've made your broaching a lot easier because you've gone ahead and reamed to something that is rotationally stable with just a simple cylinder, so now it's much easier to get your broach in the appropriate orientation posteriorly enough that you're not going to run into the issues we talked about.

00:31:18

LAWRENCE S. CROSSETT, MD: Now, if you can cut down above here to here. And you know, we want rotational stability. That's not rotational stability. So I'm going to go up a little bigger.

00:31:30

BRIAN D. HAAS, MD: People ask me how -- how tight do these sleeves need to be, and it's really the same principles that you use on a hip. It's the same thing. If you're pounding it in and you're getting rotational stability and you're having to work a little bit, that's probably the right size, but if you just pound something in and it just drops in there without a lot of effort, then I think you really have -- you really have to go to the next size up, and that's just like you would on a hip stem.

00:31:54

LAWRENCE S. CROSSETT, MD: You know, yesterday, you know, one of my big western Pennsylvania men, you know, I used the biggest sleeve possible and it still wasn't very great. So in that patient, I used a fully porous coated -- now there's the line I'm looking at here, and I'm just trying to make sure I got it. I don't want that line too far.

00:32:12

JAMES E. DOWD, MD, FAAOS: What does that line tell you?

00:32:13

LAWRENCE S. CROSSETT, MD: That's the joint line, that's the depth that I put this thing in. I think we've got pretty good sleeve here now. Plus the thing is, you know, I've got an excellent construct here. I've got fresh-cut surfaces all the way around. You know, that's going to be locked on tight, so that sleeve's going to be there. So why am I putting the sleeve in? What's the indication for sleeves? You know, absolute bone loss is the easy one. So that works on a tibia. It doesn't work here. People are going to say, "look at all the bone I just took away." Number two is the stability of the implant. I think the stability of implant dramatically improves, especially in flexion. You know, what stability you have -- especially with the constrained poly -- you have nothing in rotation, in 90 degrees. So I think that's a big plus. And the third one, which is purely my philosophy is -- because I've been doing this long enough -- I think the potential for long-term bony in-growth in a revision outweighs the sacrificing of bone. I feel really strongly about that. But you know, that's going to take our publications, that's going to take time to -- to show that. Again, I'm just trying to get this relatively good --

00:33:16

JAMES E. DOWD, MD, FAAOS: So you're paying attention to rotating the sleeve relative to the trial the same way you did relative to the bone, right?

00:33:22

LAWRENCE S. CROSSETT, MD: Yeah, you know, I --

00:33:24

JAMES E. DOWD, MD, FAAOS: I agree with that. I mean, they go in quite solidly and snug, and you really don't want to be out of rotation with those.

00:33:32

BRIAN D. HAAS, MD: And sometimes in some small bone -- or soft bone -- you can leave it just a little bit proud to ensure you get a good press.

00:33:40

LAWRENCE S. CROSSETT, MD: Let's see what we can see here. I mean, I don't know if anybody wants to take a look, but you know, if you looked at her x-rays, I mean, she's lost bone, but we are flush up against the anterior cortex, which is a wonderful added stability factor. Our -- you know, every cut is flush. This thing fits like a glove and I'm real happy about it. So we've been working now for 32 minutes, and basically we're done. And I'm hoping this is going to be her last operation. So again, doing the math, I'm five and ten here, so my guess is I'm probably going to need a

ten in extension, a fifteen in flexion, so I'm going to go with a 12.5 and compromise a little bit.

00:34:27

JAMES E. DOWD, MD, FAAOS: So what size poly is that?

00:34:28

LAWRENCE S. CROSSETT, MD: That's a 12.5. And let's just take a look here. That's too darn loose. That's -- well, we're loose loose, so let's go to 17.5. So much for my math, eh?

00:34:41

JAMES E. DOWD, MD, FAAOS: Well, you know, I've never been very good at math for starters, but also it's not so much the absolute numbers to me, it's the relative and the fact that --

00:34:51

LAWRENCE S. CROSSETT, MD: You're absolutely right, Jim. As you go through the case, you know, you're releasing, releasing, releasing, and you know, it does always get bigger.

00:34:58

BRIAN D. HAAS, MD: Especially in these cases where you've had a spacer in for infection. It's been my experience that the flexion space continually gets looser as the case goes on.

00:35:07

LAWRENCE S. CROSSETT, MD: Sure does. Now, a lot of that's our releasing. There's no doubt about it that -- okay, so I mean, this is extension. We don't have a camera on the side. You know, use the flat-belly test, which thank god, I can do that now.

00:35:24

BRIAN D. HAAS, MD: So, Larry, you're trialing with a PS insert, correct?

00:35:28

LAWRENCE S. CROSSETT, MD: Yeah, you know, and I can't remember the last time I used a constrained poly, I really can't, because there's just no reason to, there's no need to. If you have to do it, great, because the forces -- because it's mobile, the force is on the post and the wear is about half. But I haven't had to, so -- see, I'm still a little loose. Now what I'm going to do here, because this huge -- Art, could I have a towel clip?

00:35:54

JAMES E. DOWD, MD, FAAOS: Are you pretty comfortable you're out in full extension there?

00:35:56

LAWRENCE S. CROSSETT, MD: Yeah... yeah, maybe. No, I'm not. And I'm just going to approximate my soft tissues here, especially --

00:36:09

JAMES E. DOWD, MD, FAAOS: Bring that medial side around a bit, too.

00:36:11

LAWRENCE S. CROSSETT, MD: You know, let's just -- we'll just see what makes a difference. Yeah, just see. Now, you know, that's -- that's very good now, that's --

00:36:21

JAMES E. DOWD, MD, FAAOS: Yeah, that's looking a little bit better.

00:36:22

LAWRENCE S. CROSSETT, MD: That's not even approximated. So now that's a 17.5. You know, extension's tough. You know --

00:36:28

BRIAN D. HAAS, MD: It sure looks fully extended.

00:36:30

LAWRENCE S. CROSSETT, MD: Can you -- can I see anywhere near here? Camera helping us.

00:36:35

JAMES E. DOWD, MD, FAAOS: It's not a side view, but from here, it sure looks fully extended.

00:36:36

LAWRENCE S. CROSSETT, MD: Here we go, how about this, guys?

00:36:38

BRIAN D. HAAS, MD: yeah.

00:36:39

LAWRENCE S. CROSSETT, MD: Can we adjust that light a little bit?

00:36:42

JAMES E. DOWD, MD, FAAOS: Doesn't feel like it has that tendency to want to bend when you push on it?

00:36:46

LAWRENCE S. CROSSETT, MD: You know, Jim, a little bit.

00:36:47

JAMES E. DOWD, MD, FAAOS: It looks good.

00:36:48

LAWRENCE S. CROSSETT, MD: A little bit. And I think it's close enough.

00:36:50

BRIAN D. HAAS, MD: The other thing that I use visually, Larry, is if you take the -- if you look at the relationship between the spine and the femur and look at that relationship, obviously you can tell if it's hyperextended if you have impingement of your cam and box. But if -- sometimes just that eyeball, usually about three to four millimeters there --

00:37:08

LAWRENCE S. CROSSETT, MD: Yeah, I can't get my little finger in there.

00:37:11

JAMES E. DOWD, MD, FAAOS: Yeah, that looks good.

00:37:12

LAWRENCE S. CROSSETT, MD: Can we cut the --

00:37:13

BRIAN D. HAAS, MD: That's another -- especially if you're operating on a patient with a big leg, sometimes it's very difficult, but if you -- if you put your trials at full extension and kind of get visually used to what that gap should look like, that's another great thing you can look at.

00:37:29

LAWRENCE S. CROSSETT, MD: One of the things -- you know, we said going along, I didn't get ten posteriorly both sides, so I thought it'd be a little tight in extension, loose in flexion. I could take out more distal femur. That just doesn't seem right. You know, we're doing a revision, why am I going to cut bone away? I can't augment any further. If I could've gone 10 and 15 posteriorly in the femur, that've been the perfect world, but I can't. And thank goodness I reamed posterior so I could augment what I did. So you know, ideally I'd like to have a 15 in extension, a 17.5 in flexion, but you know, I'm not concerned that we're not going to do real well here. We're going to move over here, we're going to start putting some of these implants together. We still have about 23 minutes, so if anybody has questions, I'll let you guys talk.

00:38:18:

BRIAN D. HAAS, MD: Larry, why are you trialing with the PS? I've seen some surgeons in revision settings that will go right to their varus/valgus constraints for trialing. Why would you -- you should never really trial with a varus/valgus

constraint because it's going to give you a false sense of security, both your medial and lateral stability as well as your flexion -- your flexion stability. So I never trial with a varus/valgus constraint, and we looked at our numbers, and we're doing about 90% PS for our revision surgeries. I think the other thing, though, with the varus/valgus constraint that's with this type of design, with the increased stability that's inherent with that plus the rotational decoupling that's happened with this implant, I think I'm more apt to use a varus/valgus constraint in a mobile-bearing than I was back when I used fixed bearings for my revisions.

00:39:08

LAWRENCE S. CROSSETT, MD: Yeah, I think it's a win-win. And again, take it to the extreme of a hinge and we have very good evidence that these sleeves can then grow in that environment, so yeah, I think that's, you know, certainly a less of an evil at this point.

00:39:22

JAMES E. DOWD, MD, FAAOS: Yeah, certainly nobody would try to do a fixed-bearing hinge prosthesis anymore.

00:39:27

LAWRENCE S. CROSSETT, MD: Dave, do we have our sleeve?

00:39:32

BRIAN D. HAAS, MD: Well, I really think just the simplicity of this procedure, as Larry assembles his implants, back when I did a varus/valgus constrained fixed implant, at this point of the procedure I was really focused on the rotation of the tibia in reference to the femur to make sure they were exactly co-linear. And then many times you face a situation -- Jim, I know you've seen this -- where in flexion your bearing wanted to be rotated a certain way and in extension it was another. And when you have something that only lets you rotate two degrees, yet the knee itself wants to rotate greater than that, on some of these fixed-bearing varus/valgus constraints, you're putting tremendous torque not only on the post but on the tibial implant itself.

00:40:10

JAMES E. DOWD, MD, FAAOS: Yeah, I completely agree with that.

00:40:11

LAWRENCE S. CROSSETT, MD: I just wanted to show -- make this point here. We're talking about rotation, and as far as I can tell, you know, my sleeve is rotated exactly with my component.

00:40:23

JAMES E. DOWD, MD, FAAOS: So you make a point of trying to broach the sleeve in the same position you want the component, again, just for ease of setup. It's more reproducible to look at it and line them up together.

00:40:32

LAWRENCE S. CROSSETT, MD: You know, if I -- if I'm not thinking about it and I put my sleeve in like this, I mean, it's going to go in here. And what I'm seeing is this, so I'm trying to force it there and something gives, and it's usually the anterior cortex.

00:40:45

JAMES E. DOWD, MD, FAAOS: Yeah, I actually go so far as to mark the anterior cortex of the tibia in line with the trial and then line them up the same way. Sometimes you have to accommodate an eccentric defect or something, and you know, it just takes a little bit more of an attention to detail, but all things being equal, I'd like to line them both up straight for maximum bone coverage.

00:41:03

BRIAN D. HAAS, MD: So, Larry, can you just show us the extent of the por-- when you get that together, just show us the extent of the porous coating and try to tell us

a little bit about why it's coated to the level it is. And I notice that that stem you're putting on there is a slotted design and why you're using that.

00:41:20

LAWRENCE S. CROSSETT, MD: You know, we -- we, I think you'll agree, we learned a lot of stuff from Dickie Jones and the S-ROM. You know, we don't say it out loud because he'll believe it, but we have. And they use these things. And I think when you start reaming posterior on a cortex on a femur, you know, it's nice to have a little bit of a give there to make sure you're not going to hit up through any anteriorly. I think it just, you know, fits a lot better. The -- the coating on the sleeve is, what, about four levels of relief. Now why that is is because with the S-ROM, that's how it is. And that has worked for a long time. Now, the -- so the next leap is well, let's coat the whole darn thing. And Brian, we've been through that and I was real excited about it, but you know, my femoral sleeve here as Art hands it to me, I'm going to stick -- I have a fully coated sleeve. I said yesterday I used one. But I'm going to stick with this because we had a really, really good fit here. You know, if she gets this [ unclear ] that'll serve her I think forever, and I want to save the fully coated for you know, maybe -- maybe worse clinical situations. I'll let somebody else do that study.

00:42:41

BRIAN D. HAAS, MD: Well, you know, I make the same decision rationale that you do, that if I have extensive bone loss, I will go to a fully porous coated sleeve, but in a situation like you have here today where you have good coverage of the porous coating circumferentially, then I wouldn't hesitate to use the more limited proximal coating on both the tibia and the femur.

00:43:02

LAWRENCE S. CROSSETT, MD: Yeah. Now we're getting to the hardest part of the operation. Putting my augments together. Brian, I know you enjoy this tremendously.

00:43:15

BRIAN D. HAAS, MD: I do like assembling the implants at the end of the case.

00:43:19

JAMES E. DOWD, MD, FAAOS: After you've been using the hammers and saws, you've got those little tiny screws.

00:43:22

BRIAN D. HAAS, MD: So, Larry, we've been -- we were asked by the audience what implant are you putting in? Can you tell us?

00:43:27

LAWRENCE S. CROSSETT, MD: It is a posterior stabilized rotating platform. I mean, for educational purpose of today, that's what we want people to understand. This is a rotating platform, it's a unidirectional -- we haven't talked about where -- we haven't talked about unidirectional, multidirectional things at all, which I think we should.

00:43:44

BRIAN D. HAAS, MD: Well, we'll cover that during our primary today.

00:43:46

LAWRENCE S. CROSSETT, MD: Well, you know, we have -- you know, we've got five minutes, some of these people might not be at both. Go ahead while I'm working here and tell them.

00:43:53

BRIAN D. HAAS, MD: Well, as you're doing the most fun part of any revision case, which is assembling the implants --

00:43:59

LAWRENCE S. CROSSETT, MD: Yeah, why don't you distract them so they don't hear me swear here.

00:44:01

JAMES E. DOWD, MD, FAAOS: Yeah, or drop the screw.

00:44:04

BRIAN D. HAAS, MD: Well, what we've really seen is with all the concerns as I've grown older and more mature in my practice, I mean, my biggest thing in my patients coming back from 20 years ago is now poly wear, and that's the primary reason I'm revising a lot of implants in my practice is poly wear. And we know that if you have a unidirectional rotating bearing prosthesis, that the wear is cut down dramatically. And in some of the studies that I've been able to review, looking at, you know, people, now the big debate is whether or not we crosslink poly. In a unidirectional rotating bearing setting, there's actually no difference in wear between a standard poly and a crosslink poly because the forces are so tremendously cut down. So in my practice, I mean -- the reason I'm doing this in the revision setting is not only do I believe that it's going to decrease wear and decouple the forces on the tibial and femoral prostheses and cut down on post wear, but in the primary situation, I'm trying to give these patients a much longer life implant to cut down on poly wear because I really see that as the weak link in the knees, and I'm doing them on patients that are going to have a life expectancy of greater than 20 years.

00:45:13

LAWRENCE S. CROSSETT, MD: Yeah, yeah. That -- you know, loosening forces, the ability to put the augments on, and the issue with the post wear. I mean, post wear's an issue. All right, now again, let's talk about rotation. And paying attention to me, I'm talking and doing two things at once, which by definition, I'm a male and that can't be done.

00:45:32

BRIAN D. HAAS, MD: So this implant, Larry, has a fixed boss, and you're going to rotate -- you're going to rotate that sleeve parallel to the flange.

00:45:40

LAWRENCE S. CROSSETT, MD: Yeah, that flat surface there I'm going to put parallel.

00:45:45

JAMES E. DOWD, MD, FAAOS: And again, you paid attention to that while you were doing the sleeve broaching just because it's an easy eyeball mark to match up with.

00:45:54

LAWRENCE S. CROSSETT, MD: You know, it's -- you know, it's all relative. It depends what you really think is important. I think that's important. You know, you break a couple --

00:46:00

JAMES E. DOWD, MD, FAAOS: Yeah, no, hugely important.

00:46:02

BRIAN D. HAAS, MD: Well, I think it's hugely important, and it's just ease of assembly at this point. I mean, all of us who have been in long revision cases, this is the part where you're getting tired, you don't want to struggle, the tourniquet has been up for a long period of time. I mean, this is where you want everything to just go slick and you don't want any issues. Again, you're going to use that -- the same sort of stem on the femur that you used on the tibia.

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LAWRENCE S. CROSSETT, MD: Yeah, and I think probably the femur's probably even more important.

00:46:30

BRIAN D. HAAS, MD: Yeah, because you're always fighting an anterior bow, and if you're able to have those slots collapse, I think that in the long run is going to save us all a lot of headache from fractures.

00:46:40

LAWRENCE S. CROSSETT, MD: Art, you want to mix cement? Now listen, we're going to use the antibiotic cement. I don't know what your thoughts are. We're sort of struggling with the cost issue here, but you know, anybody prior infection, any immunosuppressed patient, the transplant patients, rheumatoids, you know, and more and more and more tend to use it. And I know, Jim, you use it a lot, don't you?  
00:46:57

JAMES E. DOWD, MD, FAAOS: Yeah, we use it a lot in our hospital, in our practice. We had a surgical site infection task force we started four years ago, and you know, we've seen our infection rate drop to below the CDC benchmark for our hospital that does as many as we do. And one of the components we used was antibiotic cement. And cost is definitely an issue. We made some concessions on some other things that maybe we didn't need to use intraoperatively to save some money to make up for the difference, but I think all the studies out there, and it's a much more popular thing in the European countries, but you know, there isn't a study out there that shows that it -- that it was a negative effect, let's say, on the infection rate. So it's been good in my practice, it's helped me a lot in the last couple years.  
00:47:38

LAWRENCE S. CROSSETT, MD: You know, yeah, in Europe, we had this discussion, they look at me like I've got three eyes. You know, the thought of not doing it on everybody is unbelievable. I'll tell you something we've done recently, Nalini Rowls (sp?), our infectious -- is one of our infectious disease consultants here, and we started culturing noses. We cultured the nares of every -- every operative patient. You know, 35% of the carry staph, and about a third of those are MRSA, and so we treat those people with bactroban ointment in the nares and we give them special antibacterial scrubs. Our surgical staph infection rate has plummeted by two-thirds.  
00:48:15

JAMES E. DOWD, MD, FAAOS: Wow, that's great. I know our infectious disease individuals are looking at it as well. We've been talking about doing the bactroban, that's good to hear.  
00:48:21

LAWRENCE S. CROSSETT, MD: Well, I think the answer is, you know, we really don't know how to handle these people or treat these people that are positive, you know, carriers, so you know, rather than dealing with it, why don't we just treat everybody?  
00:48:32

JAMES E. DOWD, MD, FAAOS: Right. And at least eradicate it around the time of surgery.  
00:48:37

BRIAN D. HAAS, MD: Well, at my institution, I think the cost of adding cement's about \$200 per batch, and when you look at the overall cost of having a recurrent infection, another surgery, prolonged antibiotics, I think that it's money well spent.  
00:48:50

LAWRENCE S. CROSSETT, MD: Yeah, but you know, then you know, I'm doing more metal/metal, that's more expensive. I'm doing more antibiotic cement, that's more. I'm doing more sleeves. Everything we do day in, day out, costs us more. Can we go back to that camera shot from up top here, please? Again, we can see it pretty well. Can we cut that glare out of there? You can see it pretty well prepared tibia here. That is all very good.  
00:49:13

BRIAN D. HAAS, MD: Any tricks that -- or how do you put the cement on the femur so that you're not getting cement down into the interface between the porous coating and the implant?  
00:49:25

LAWRENCE S. CROSSETT, MD: Yeah, you know, on the tibia, there's not much. We do what I call surface cement. So I'm going to cement all of this surface in here. And on the femur --

00:49:36

BRIAN D. HAAS, MD: Do you put it on the implant or do you put it on the bone and just try to avoid it?

00:49:39

LAWRENCE S. CROSSETT, MD: No, no, I'll put it on the implant, because I don't want any down there. And the femur, I'm just going to put in here. And the patient, as I mentioned earlier, had a patella femur arthroplasty, so she doesn't have a patella, so we're --

00:49:50

JAMES E. DOWD, MD, FAAOS: Not doing that one.

00:49:51

LAWRENCE S. CROSSETT, MD: Yeah.

00:49:52

JAMES E. DOWD, MD, FAAOS: And just a reminder to our audience in the field, you can contact us with questions if you have a burning issue you'd like to have discussed by using the MDirectAccess button on your screen. You know, we're able to read the questions and then get back to you on the answers.

00:50:07

BRIAN D. HAAS, MD: Larry, there was a question from one of our viewers about: you don't vacuum-mix your cement, do you think that plays any role in your knees?

00:50:18

LAWRENCE S. CROSSETT, MD: Probably not. You know, I'll be honest, that's just a cultural Shadyside thing, you know? It's like these little blue bowls cost about, you know, 85 cents apiece. I mean, I think environmentally, we probably ought to vent the fumes if nothing else, but again, that's a cultural thing, that goes back to long before I arrived here at Shadyside nine years ago, so --

00:50:38

JAMES E. DOWD, MD, FAAOS: Yeah, that was actually one of the concession items we gave up cost-wise to accommodate the antibiotic cement price increase.

00:50:45

LAWRENCE S. CROSSETT, MD: You know, now those rare hips I cement anymore, you know, I'm fusing and the whole bit, so I guess there's a little bit of inconsistency.

00:50:54

BRIAN D. HAAS, MD: I think --

00:50:55

JAMES E. DOWD, MD, FAAOS: Imagine that.

00:50:57

BRIAN D. HAAS, MD: Well, I think in my practice, I've always just vented the cement. I've never used a centrifuge, and it's really just a safety factor in the operating room.

00:51:05

LAWRENCE S. CROSSETT, MD: Yeah, yeah. You know, that whole discussion, we're obviously not going to solve here. Now I know, this is about as much fun as putting augments on.

00:51:17

JAMES E. DOWD, MD, FAAOS: Watching the cement dry? Harden up?

00:51:20

LAWRENCE S. CROSSETT, MD: You know, you could put the -- you could start the cement earlier, but that lateral posterior augment's so tricky to put on, every time I

mix the cement early, you know, the cement's setting up and I can't get the augment on, but --

00:51:31

JAMES E. DOWD, MD, FAAOS: Hey, Larry, I know we've had this conversation, but you know, you've started looking back at doing these mobile-bearing revisions over the last four years, and you think you're doing anything, you're having a better level of success range of motion-wise or function-wise?

00:51:45

LAWRENCE S. CROSSETT, MD: You know, range of motion, that's like -- that's a no-brainer. We looked at our -- we looked down a couple ways. The first hundred or so was very inconsistent. I went in a big circle in where I started, where I ended up. You know, I started here and didn't know how to do it right and I ended up back here doing it better. So the last hundred are a very consistent group which we'll need to study, but motion-wise, you know, 40% of our revisions are for infections, so they've all been staged, you know, forever. And --

00:52:14

JAMES E. DOWD, MD, FAAOS: Just sort of worst-case-scenario.

00:52:16

LAWRENCE S. CROSSETT, MD: You know, the number of people at six months less than 90% of flexion is very, very small. And more mimics the percentage of people who had revision for motion, which you know, that's always such a promising venture.

00:52:30

JAMES E. DOWD, MD, FAAOS: Yeah, I've had sort of the same experience. I went back and looked at fixed-bearing and compared them to the mobile-bearing, and you know, the overall average range of motion didn't really change much, but the percentage I had over 110 degrees was significantly more, which I feel very strongly that it's owing to that posterior condylar offset and paying attention to posterior condylar augment.

00:52:50

LAWRENCE S. CROSSETT, MD: Exactly. I can't honestly sit there in an educational forum and say that our motion's all great and wonderful because we're using a rotating platform. I mean, you know, we'd like to think that, but we're not doing it for motion, we're doing it for wear and other issues. But the -- you know, what we've learned because, you know, spin out. You know, the last thing I want to do, everybody's worried about spin out, so the last thing I want to see is this spin out, so I pay attention to this whole posterior flexion gap issue and then I start thinking about reaming, we do the math on it, so you know, I'm putting my components in such a better -- such a better position right now, and --

00:53:31

JAMES E. DOWD, MD, FAAOS: Yeah, but I think it all plays together. I mean, but certainly the technique and the paying attention to the flexion gap and restoring the posterior condylar size and offset and augmentation, you know, your tendency is to look at the bone and you're deficient back there, and so you just hold up a component, and you know, put on something that's going to contact the bone a little bit and you really haven't done that much for restoring what should be offset back there.

00:53:52

LAWRENCE S. CROSSETT, MD: So we're doing a better job of what we do, and you know, I do believe it's going to last a whole lot longer. That sounds generally like a win-win, which I guess is why we're here, right?

00:54:05

JAMES E. DOWD, MD, FAAOS: Right.

00:54:06

LAWRENCE S. CROSSETT, MD: I think that's a win-win for the patient, it's a win-win for us. Nothing worse than your patient -- you get, like I've been around here for a long time and you've seen your own patients coming back with failures. You know, it's -- it's not a whole lot of fun. So now again, this setting down here nice, that sleeve's nice and snug.

00:54:31

BRIAN D. HAAS, MD: And I think the real key there is as you're driving that in, it's almost a sense like you would drive in a hip stem. I mean, you're getting that sense of not only rotational but really of -- of compression and you're actually getting some tactile feedback that you're -- you are really hitting something in solidly and that sleeve is engaging. So that's a good tactile feel you get back.

00:54:54

JAMES E. DOWD, MD, FAAOS: Yeah, I can't say enough about how solid I find those. There's a number of cases where I have a tough time getting the trial back off again because of the way it fits. And usually, you know, previously it would be the case that you put the trial in and you move it around and the femur always kind of rattles around and it pops off when you flex it. And you know, with the sleeves in, it's hard to get back off again. So what poly did you end up deciding on, the 17.5?

00:55:18

LAWRENCE S. CROSSETT, MD: I did. You know, that snaps in posteriorly, so that's snug. And again, yeah, so I'm going to, you know, give her a lecture about -- you know, she's had these blocks in for...my goodness, you know, eight, nine months. I think we'll be able to squeeze out a few degrees of extension. You know, it's a compromise. It's a compromise.

00:55:42

BRIAN D. HAAS, MD: Especially in these secondarily -- these secondary revisions after you've had a spacer block in. It's been my experience through the years that these patients, many patients will not loosen up over time, but these are definitely a patient that I think I'd rather have it just a little bit tight than a little bit loose. Larry, there's -- we've had two questions come in late about tibial offset. While the cement's drying, do you have a tibial offset option? Do you need one when you use stem and metaphyseal sleeve, and has that been an issue in any of your cases?

00:56:13

LAWRENCE S. CROSSETT, MD: Here's the problem. You know, we're working with groups and designs and stuff and everybody comes into these groups saying, "we need offset." And so I mean, there's stuff on the shelves, there's these designs that are looking to offset sleeves, but I guess the people that have been doing this for a while, we just don't use them. I mean, if you have an offset issue, you can position your sleeve -- your stem and your sleeve to off-- to outcome that. You may have one size smaller tibial tray than maybe you want, but now this becomes a -- you know, a compromise. You know, if you think you need offset to get a little bigger tray and if -- if the loss of the benefit of a rotating platform wear, loosening forces, metaphyseal sleeves, if you think that's that big of an issue, then I hope we get offset sleeves developed real quickly. But you know, once people start using these things, it's not -- I used a lot of offset tibias when I was doing fixed bearings, but it's just not been an issue that I've run into. What's your experience?

00:57:19

BRIAN D. HAAS, MD: I have not seen the need for an offset tibia in my practice using the sleeves, and having not to -- not to go to excessive-length tibial stems after I've started using the sleeves, I haven't seen the need in my practice for an offset stem.

00:57:33

JAMES E. DOWD, MD, FAAOS: Yeah, I mean, I've been much happier using the sleeve to control the centric position of the tibia and the good metaphyseal bone than I ever was trying to use the diaphysis to guide me.

00:57:44

LAWRENCE S. CROSSETT, MD: Yeah. You said there was two questions, or just two questions about the same topic?

00:47:46

BRIAN D. HAAS, MD: Well, the other question if we have time is since this patient doesn't have a patella, we haven't discussed the patella at all. What are your -- what do you do in the patella knee situations? Do you use all poly metal back rotating --

00:57:59

LAWRENCE S. CROSSETT, MD: You know, if I can, I resurface it. If there's any way I can resurface it, I do. If I can't, I generally do a patella-plasty. Those people have done pretty well. They hurt for about three months and they do fine. You know --

00:58:10

JAMES E. DOWD, MD, FAAOS: What about leaving the patella behind, Larry, if it was some other resurfaced dome -- poly dome thing?

00:58:16

LAWRENCE S. CROSSETT, MD: You know, most people -- I'm sorry? All right, Greg's telling me get the hell out of here. Yeah, he's right. I'm going to slow him down.

00:58:27

JAMES E. DOWD, MD, FAAOS: He's going as fast as he can.

00:58:28

LAWRENCE S. CROSSETT, MD: I'm going to slow him down and stab him. The -- what were we talking about, sorry?

00:58:35

JAMES E. DOWD, MD, FAAOS: Would you leave a patella component behind, well fixed, all poly, dome?

00:58:39

LAWRENCE S. CROSSETT, MD: Yeah, yes, I would, because usually taking them out, a well-fixed patella, is usually more of a problem than it's worth. Although I'll tell you, you know, I mean I've put 200 of these plus these in and I'll tell you that I have one I remember that I retained a -- a dome patella with an LCS, you know, anatomic trochlea, and I got a bunch of crepitus. I mean, you know, what's that mean, I don't know? But generally I'd leave it alone.

00:59:03

JAMES E. DOWD, MD, FAAOS: I agree. Well, that's been great. I mean, you made that look great, and you know, it's a nice way of going around the revision in a difficult case. We didn't get to see all the exposure, but certainly have the soft tissue window nicely exposed by the time we were there. Looked great, appreciate it, appreciate UPMC for letting us be their guests today, and it was a great show.

00:59:22

LAWRENCE S. CROSSETT, MD: Okay, Jim, and we -- are we still on or off?

00:59:25

BRIAN D. HAAS, MD: We -- we are at -- we're still on, but we're signing off.

00:59:27

JAMES E. DOWD, MD, FAAOS: Signing off.

00:59:28

LAWRENCE S. CROSSETT, MD: I can't swear yet.

00:59:30

BRIAN D. HAAS, MD: Well, thanks very much.

00:59:31

LAWRENCE S. CROSSETT, MD: Thanks, guys.

00:59:35

ANNOUNCER: Thank you for watching today's broadcast demonstration of the DePuy Orthopedics LCS complete mobile-bearing knee revision system, brought to you from UPMC Shadyside Hospital in Pittsburgh, Pennsylvania. OR-Live makes it easy for you to learn more. Just click on the Request Information button on your webcast screen and open the door to informed medical care.

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