

Doctors In-Depth

full length interview

"Mako Rio Knee Replacment"
Martin Roche, M.D.

Martin Roche, M.D., Director of Robotics and an orthopedic surgeon at Holy Cross Orthopedic Institute in Fort Lauderdale, Florida, talks about how new technology in the operating room is making knee surgery easier for both patients and doctors.

Interview conducted by Ivanhoe Broadcast News in November 2016.

Doctor, tell us first of all when it comes to knee replacements we hear about it all the time how many have you done this year? I mean I imagine a lot of people end up needing this.

Dr. Roche: Total knee replacements are the fastest growing segments in orthopedics in terms of joint reconstruction. In the United States this year would probably do close to 650,000 and the way the baby boomers are now coming into retirement age where we are expecting to do in the millions during the next decade.

Tell us what MAKO is and how this technology was really a breakthrough here at Holy Cross?

Dr. Roche: When someone presents with arthritis, we use conservative approaches until they fail, and then perform a complete knee replacement. When we first started evaluating and then designing the MAKO technology, we first started looking at each patient's knee individually. Some patients do not require a complete knee replacement; some patients just need the area that's arthritic resurfaced, and that is termed a partial knee replacement. We did our first case in 2006, and here we have done over 1,000 successful cases to date. The nice thing about that approach is that I get to keep your native ligaments, tendons and muscles and only resurface the damaged part of your knee; that's called a partial knee replacement. Then we expanded it to address two parts of your knee so if your kneecap was worn out as well, we could fix the inner or the outer part of your knee plus the kneecap; and that was an extension after the partial knee took off in 2006. We then begin developing a total knee approach. When you have a patient that requires a total knee replacement, using manual instruments does potentially add some inaccuracies because they are not exact as with the robotic application, Preoperatively we can place the implants specifically where it needs to go on that patient anatomy based on their CT scan, and then in the operating room we use the robotic arm as an extension of my hand to place it specifically and accurately every time. During the procedure then we can utilize sensors (Verasense) to look at the different ligaments to determine if the knee is truly balanced, and I can then use the robot to change angles or do what we call releases of the soft tissue to make sure that implant is snug, it's not unstable and it has full range of motion.

This seems like a great advance if only for the surgeon because like you are saying, you need the surgeon but the robotic part of it is helping with it being so precise, how does it help the patient, how does it benefit the patient especially when it comes to recovery doctor? Because we know recovering from a total knee in the past has been very difficult for some patients.

Dr. Roche: Total knees are one of the more difficult acute recoveries of all the joint replacements we do. For multiple reasons, it's very superficial, has a lot of nerve endings, and in a total knee you have to bend the knee so it doesn't get scarred in and have a bad result. The benefit to the patient with this technology is really two-fold. One, we can customize the surgery for you, not all of our knees are built the same, or have the same range of motion, and so going in with one approach doesn't always allow us to address the different variability's we find, so now we can customize the surgery. Secondly, if we can do accurate bone cuts and accurate alignment, there's a less chance of a revision. Today still if we look at the knee to revise or replace a total knee that's been done approximately thirty to forty percent are due to imbalance, instability, malrotation or malalignment and having the tools in the operating room to achieve the exact results you want is going to minimize as that risk. This translates to patients recovering quicker, they can come off their cane or walker earlier, but more importantly they can resume activity such as golf or tennis where it requires that your knee to be balanced and stable for you to use it like you want to use it. Our hope is that in the future that we can show that by putting it in so precisely the wear on the bearings will be minimized and potentially these knees can last even longer than fifteen or twenty years.

It's not just older people who need total knee replacements, right doctor? You have seen people 30', 40's and 50's.

Dr. Roche: Unfortunately, that's the true case. We have seen patients in their 30's, 40's and 50's with either trauma or prior surgery, now as a young person requires a knee replacement. Having the robotic technology it allows me to individualize what part of the knee that needs to be resurfaced or replaced. Then to accurately do it because those younger patients have higher expectations, they are going to put a lot more stress across the implant and they are going to use it to a higher level and we need to demand match that patient. We can now place the implant and pick the right implant to achieve that.

These patients like you said Dr. Roche can go on to do resume normal activities and I mean tennis, cross fit. Will they be able to continue those kinds of activities?

Dr. Roche: Yeah, it is interesting most of our patients come to us now because they can't participate in their social activities, such as golf or tennis. It's so important to them especially when they retired so this procedure does allow them to return to an active lifestyle. We do ask our patients not to run on them because you almost have to think of the bearing as a tire on your car and if it is well aligned, well balanced and the pressure in the tires are equal those patients will perform well. But we do restrict them to high intense activities.

Is there anyone Dr. Roche who's not a good candidate for this procedure?

Dr. Roche: I think anybody that is a candidate for a total knee replacement is a potential candidate for this procedure. It's going to come down to surgeon training, as well as, patients understanding the advance technologies. We do navigate this so if there are patients with very soft bone, we may have some concern because of the way we have to put the trackers in the bone. It potentially may even help us in the larger size patients because it is harder with manual instruments to make accurate alignment cuts and doing the procedure. Having the robot, I don't have to worry so much about how large the leg is or how big the bone is.

Where is this total knee replacement available?

Dr. Roche: Right now, we just finished what we call an empathic study, which is a planned procedure to look at ten different sites throughout the United States to define the efficiencies safety of the procedures. This is a FDA approved procedure in Stryker Corporation the company will probably be launching this throughout the United States going into next year. But for now we were the first site ever in the world to do a partial and now a total knee replacement with this technology and our orthopedic team can offer this technology to our patients.

So far very successful, right Dr. Roche, I mean you are hearing very good reports from patients.

Dr. Roche: Yes, the patients are very happy with the results, but more importantly, interesting patients are coming to us seeking this new technology. A lot of patients that have been thinking about a knee replacement want to go to a center that offers the best technology to get a good outcome and Holy Cross continues to do that.

END OF INTERVIEW

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