Andrea Spiker :

Welcome everyone to the Arthroscopy Association's Arthroscopy Journal podcast. I'm Dr. Andrea Spiker from the University of Wisconsin. And today I have the privilege of speaking with Dr. Stephan Aoki, who is a professor and chief of sports at the University of Utah, where he also serves as a University of Utah team physician and head orthopedic team physician of Real Salt Lake Soccer. Dr. Aoki was a senior author of the article titled Previous Arthroscopic Hip Surgery Increases Axial Distractibility Compared to the Native Contralateral Hip and May Suggest Instability which was published in the May 2022 edition of the Arthroscopy Journal. Dr. Aoki's co-authors include Alexander Mortenson, Kelly Tomasevich, Sue Ohlson, Dillon O'Neill and Joseph Featherall. Thank you so much Dr. Aoki for joining me today.

Stephen Aoki:

Thanks Dr. Spiker, always great to talk to you. It's always nice to spend time with you. I find you to be one of my favorite colleagues to hang around with at the meetings. Thank you.

Andrea Spiker :

Likewise. I'm so glad you're here on our podcast with us. So Steve, would you mind starting us out today by just telling us a little bit about your practice and the types of sports and other injuries that you see?

Stephen Aoki:

Sure. So my practice is a split between pediatric and adult sports medicine. I spend about 50/50 of my time having a clinic with pediatric patients and then more of an adult practice as well. It's sort of backwards with the two where on the pediatric side, I see probably about 80% knee, 20% hip. And then on the adult side, it's the exact opposite where it's about 80% hip, 20% knee currently as far as numbers. I've been at the University of Utah for a while now and did my training here as well. I'm not sure what happened. I've always thought of myself as one of the junior partners in my group. And then one day I blinked and no longer in that role. I'm starting to feel my age.

Andrea Spiker :

It's just showing that you are now an expert in the field. And I think that's not just at Utah, but also nationally. So we're glad to have you here talking about some of your recent research.

Stephen Aoki:

I appreciate the opportunity.

Andrea Spiker :

Speaking of this current research paper that we're talking about, how did this question related to Distractibility of the previously operated on hip arise?

Stephen Aoki:

Sure. This is... As you know, hip instability is kind of a challenging issue in the world of hip preservation. And I do find it to be a little bit harder and maybe the questions that we have are a little bit more challenging to answer right now in the native state. But I guess in the revision side of things, I think it's starting to get a little bit more clearer as far as the issues that we run into with hip arthroscopy and particularly capsular management. There's... We're starting to see... As far as from the revision standpoint, you see patients with hip pain after a hip arthroscopy and while most people do well after a

hip arthroscopy, there are some people who just don't improve. And it's been historically you look at why do people hurt?

And it's sort of always been under resection of bony deformities and labral re-injury. But as we started to evolve, we're starting to understand more that the capsule and the hip stability is more important. I was just recently involved in an international consortium on hip instability, where we're trying to identify how we all define the issue of hip instability. And this was another arthroscopy publication that was headed up by my good friend, Marc Safran at Stanford. And he gathered up a international consortium to look at what do we look at? And probably the one thing that we could... The one major issue that we could all agree on is that under anesthesia that the hip distracts easily. And so it just pulling on the leg... We all kind of had this idea that when you pull on the lower extremity, that the hip opens up or is easier to distract and that was a sign of instability.

And we just wanted to look at this a little bit more with more objective data. And luckily the table I use for hip arthroscopy now has a built in tensiometer which allows you to look at the Distractibility and how much force it takes to distract a hip. And I always tell my patients that's like having a built in fish scale so they can understand what we're doing when we do an exam under anesthesia. And we just wanted to take that information, try to put something objective to it and see can we put a little bit more objective data to this idea that a hip distracts more easily and that's a sign of instability. And that's kind of how these papers have sort of evolved.

Andrea Spiker :

And you bring up an excellent point about what we typically understand as one of the main reasons for revision, hip arthroscopy, and previously it's always been described as that under resection of the cam. The new understanding of some of these more subtle and soft tissue related issues is an interesting one. And it's also something that's, I think, harder to see preoperatively. So our limitations in MR-Imaging, especially in the post-op hip, really make it hard to see those things related to the capsule, for example. So I think this is an excellent question and I'm so glad that we're starting to finally get a little bit more data on what this means.

Stephen Aoki:

Yeah, I agree. I agree. We need to... There's certainly more areas or more research that we need to do to focus on this idea, to understand all the reasons why individuals are not doing well after a hip-scope because there's the issue of hip stability. We've always thought of it as a really constrained joint and that's not necessarily true.

Andrea Spiker :

So speaking of a native hip joint, how then were you able to determine the Distractibility of the hip that had not been operated on? Were you in the operating room trying to distract that hip first, prior to pulling traction on the operative leg?

Stephen Aoki:

Yeah, exactly. So this started out just trying to figure out how to figure out is someone really loose because of what they had previously from their previous surgery? And so as you know, everyone's kind of built a little bit differently. Some people are just naturally a little bit loose and other people have a tight hip. And so we're trying to figure out why is someone symptomatic on one side versus the other. And like a lot of the other things in orthopedics, we're kind of looking at symmetry and symmetry within a person. And so I did used to sort of get a feel of the contralateral hip by just pulling on the hip before I

have the tensiometer and then I'd pull on the contralateral hip and try to get a feel of whether I could get that hip to move.

And now with having a tensiometer I can take and I can look at the native hip or the contralateral hip and pull on that hip and get an idea of their baseline and compare it to the hip in question, the one that's undergoing the revision. And so I can look at the difference between the two sides and the way that we have it designed as far as a protocol, as far as how I look at this, it's look at the hip and I visualize it on fluoroscopy at zero pounds. And then I pull it in 25 pound increments up to 100 pounds. And then I compare the two sides.

Kind of the two main things that I look at clinically is at what pound pressure do we start seeing distraction and then at overall distraction at a hundred pounds, how much did it distract compared to the contralateral side? And that gives me an idea of, is it truly loose or is it looking pretty normal? And then there's some limitations. It's kind of a basic concept but as far as looking at trying to get an idea of how much that hip moves and how much it distracts, it's kind of the best I've got right now, as far as trying to make sense of this issue.

Andrea Spiker :

Yeah. And this is a lot more than we've ever had before so that's great. Now, in your experience, are there any clinical signs or imaging findings that might suggest hip instability in the previously operated on hip prior to getting the patient in the operating room and then testing Distractibility?

Stephen Aoki:

Yeah, sure. We have another paper that we put out a few years ago that looked at sort of the clinical issues that may occur with these individuals. So we took individuals that were hip instability patients where we went back and we did either a capsule repair or capsule reconstruction. And we tried to look back and see what do people complain about. We looked back at history, physical and studies, and tried to figure out are there certain findings that people were complaining about? And the biggest issue is pain. There's pain and they're just not improving. And in that paper, most of the patients had pain with their activities of daily living and all of them struggled with sports. It happened most commonly in females, hyper mobile patients. And then there's probably some issues related to the shallow dysplastic or mildly dysplastic hip with stability. And they're just less tolerant of having a capsular issue.

We also identified patients more recently that thin capsules are more likely to have instability after a hip scope. Maybe they're not as likely to heal. And so that's another study that should be coming out here pretty soon. On physical exam, my preference is to do an axial distraction test. And the way I do that is, at least initially when I first started doing it, I would put my knee underneath their ischium and I bend the hip up about 45 degrees or so. And then I do pull on the hip and I start off pulling lightly and then I start pulling a little bit harder. And I look for three components. I look at pain. I look at whether someone has apprehension when you pull and whether I can actually get that hip toggle out of joint and it has this little bit of a softer end point.

It doesn't... The body doesn't shift and move while you're testing. That's evolved as well. I also think of it a little bit like Lachman's exam, where you examine the contralateral hip first. And you can get a feel of that hip as you pull on it. And usually on the normal hip or on even an FAI hip or where they have pain with impingement testing if I do an axial distraction test, they usually don't hurt. When I pull on a hip that's unstable, they usually have complaints or they feel that difference between the two sides. There's certainly other ways of looking at stability that have been described as well.

The last aspect of this is the MRI issue. We have another paper that we put out looking at MRIs and MRAs. My preference is to get an MR-Arthogram on all revision patients because it's just easier to

identify size and quality of a capsular defect. Sometimes it can be really difficult to see on an MRI. And we've had patients where we've had patients come in with MRIs, where their capsule looks pretty decent. And then we've repeated it with an MR-Arthogram and it's a large defect that's obvious to visualize on your study. So at least in the revision setting, I always get MR-Arthrograms.

Andrea Spiker :

I agree with you. I have the same preference in the revision setting, whereas I get an MRI with no contrast in a native hip, the MR-Arthogram, I think it's so impressive sometimes when you see exactly as you were discussing a huge plume of that arthogram dye exiting the capsule where it may just lay flat on an MRI without that increased fluid inside the joint.

Stephen Aoki:

Yeah, I agree. It takes away the guessing, right? It... You see these real large defects sometimes that you just don't visualize on the MRI.

Andrea Spiker :

Absolutely. So let's talk a little bit about what you found. Did you find that the type of capsulotomy the patient had in their prior surgery make a difference in the Distractibility?

Stephen Aoki:

Yeah. That's a great question. With the numbers that we have, we just weren't able to look at the actual type of capsulotomy and whether that played a role in the instability issue. I'll tell you though, that when you look at the capsulotomy types where you're looking at inner portal, versus T-ing it, our numbers were not very high on the T side. But our numbers, I think in general, if you look at our area, there's probably a little bit of a bias as far as how things are done from a capsular management standpoint. But that's a great question. I think it's still something that is yet to be answered. I will tell you that the ones that... The individuals that come in to see me, where they have not had a capsular repair, and they're coming in with instability, they consistently distract more than their native hip. So I think if you look at the ones... I kind of expect, if someone didn't have a capsule repair and they're complaining of discomfort, they're going to have an unstable hip.

Andrea Spiker :

Yeah. That's an excellent point. I have the same experience with patients who haven't had a capsule repair at their prior surgery. And I'm hoping that nowadays there's more of a shift in that people around the nation are repairing capsules as we're realizing these issues if you don't repair the capsule. The one question I always have if a patient comes in with a failed hip arthroscopy from another surgeon, even if they do say they've done a capsular repair, it's hard to know what the quality of that capsular repair was. Did they put one stitch in and call it repaired or did they do a nice robust capsular repair? And I think that makes a difference that we just, as of yet, can't quite quantify when we're looking at pre-op imaging and operative notes.

Stephen Aoki:

Sure. I completely agree with that. I will also tell you that I kind of feel like with my capsule repair, I think about this a lot when I'm surgically addressing the hip and I'll do my best to close that capsule and I try to preserve that capsule throughout the surgery so that I'm not getting into any of the native tissue. And I still have my patients that don't heal. And it's even in individuals that get water-tight closure. There's

sometimes individuals that don't heal that capsule. Maybe it's not enough for their hip to give them the stability that they need, that it might stretch out or down the road, do they re-tear it with an aggressive pivoting episode? There's just some people who that soft tissue doesn't do its job in the healing process. It just doesn't... It's not competent enough for the patient.

Andrea Spiker :

Absolutely. Yeah. And I certainly have had patients who two weeks after surgery, especially here in Wisconsin, when we have icy winters slip and then go into the splits or something occurs before the capsule has completely had a chance to heal. And then of course there are patients with connective tissue disorder such as Ehlers-Danlos and they may have some difficulty healing that capsule as well.

Stephen Aoki:

Yeah. You bring up a good question with patients. You have that patient that's doing really well. They have that injury right after the surgery and all of a sudden things just don't feel right. It doesn't... They just have that look in their eye that something's wrong. I move on those patients quickly nowadays because I've been through this enough where you kind of watch them, you nurse it, you nurse it, you nurse it. I move on them quicker nowadays. I'll clinically if someone has an injury in a way that they hyper-extend or they move their hip and it just something happened and they are now all of a sudden worse, I'll move on that hip and go in because usually that means that they ripped through those capsular stitches.

Andrea Spiker :

Yeah. That's a very good point. So what do you think, in those patients that had a reported capsule repair prior to surgery, when you got into that hip in the revision setting, what did you see? I mean, did you find that in most cases that the capsule just had dehisced or had not healed? Was there a lot of scar tissue? Was it just a thinner healed capsule? What was a common theme when you got back into those hips?

Stephen Aoki:

Yeah. It's variable and I think that, as you know, when you look at MR-Arthogram the appearance is quite variable as far as what you see. And we try to quantify this on MR-Arthogram, it's really challenging. Sometimes the capsule looks like it's sort of bare, but it looks thin. And so there's sort of this redundant look on MR-Arthograms. And it usually correlates to when you get in to the hip that that hip, that capsule looks like it's sort of there. But when you start dissecting through the soft tissue, you can kind of tell what's scar and what's sort of bridging scar and what's native capsule. And other times it's like a blown out capsule where it's just grossly, that ballooning effect up in the front, in that inner portal or in that T region.

Oftentimes what I'll see is kind of a gap where you see that the stitches are visible. And it sort of marks out that area of the capsule that didn't heal or split open. And then on T-cap slotting is what I'll see is that on MR-Arthrograms, those are the ones that if the vertical on the T has failed, what it looks like on the MR-Arthogram, it almost looks like it's deficient in capsule going all the way down the neck. And when you get in and you see those capsular defects, it's usually that there's an opening that you can find and you can kind of trace that down and follow that area where the stitches didn't heal.

And so, again, it's quite variable as far as what I see when I get in there. The one thing that I'll tell you that I'd usually do for the revision hip is if I'm going in for a revision, I'm always using that... When I'm setting up my portals, I'm setting up my portal that I normally do, but I move that spinal

needle around and I try to find the defect so that I don't cause more harm to the native capsule. I'm feeling for that area. And usually you can feel an area where you just drop into the hip where you can find that defect. And so I'll target my spinal needle into that previous capsulotomy defect so that I'm not injuring further capsule.

Andrea Spiker :

That's a great tip. So in our last couple of minutes here, do you have any takeaways from this particular research study? You've looked at it with other papers and multiple different questions but what was there about this particular study that you think might change your practice going forward or be an emphasis in something that you teach your residents and fellows?

Stephen Aoki:

Yeah, that's probably the most important question here is trying to take what we do and try to apply that to the clinical perspective so we can take better care of patients. And when I'm looking at... I guess the main issue that I would try to get out there is that when you're evaluating a hip, that's still painful after a hip arthroscopy, we've historically thought of it as something structural with like the labrum or bony anatomy. And I think we just have to think about hip instability due to capsule insufficiency as just another potential cause. And I personally think that it's under evaluated and it happens more than we think after hip arthroscopy. And this has changed my practices.

In my practice today, I currently rely a lot on that stress exam under anesthesia when making a clinical surgical decision. So I do that stress exam at the beginning of all of my hip arthroscopies to get an idea of is there something different about that the hip that we're operating on? And that gives me some information that I can use to potentially hopefully overall make this process better and try to make it so that when we look at the results of hip arthroscopy, that we continue to get better so that we have less individuals that have continued hip issues after the procedure.

Andrea Spiker :

That's an excellent point. And I think understanding more of these underappreciated problems will just, as you said, make us better and help our patients going forward. So thank you so much for doing this research and putting this out there and also for talking to us about your experience.

Stephen Aoki:

Thanks, Andrea. I really appreciate the time.

Andrea Spiker :

Dr. Aoki's paper titled Previous Arthroscopic Hip Surgery Increases Axial Distractibility Compared to the Native Contralateral Hip and May Suggest Instability can be found in the May 2022 issue of the Arthroscopy Journal or online@wwwdotarthroscopy.org. This concludes our episode of the Arthroscopy Journal podcast. Please join us next time. And thank you so much for having us.

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