BERNARD GERSH: Hello, I'm Bernard Gersh from the Mayo Clinic. And we are here for a roundtable discussion today with two of my colleagues, Dr. Malcolm Bell, who's professor of medicine at the Mayo Clinic, and Dr. Mackram Eleid, who is a member of our cardiovascular fellowship program. And our topic today is to deal with radial versus femoral artery access in patients with the ST elevation and myocardial infarction.

And this was the subject of a recent review in *JACC: Interventions* published in November. And Malcolm, I was quite struck with the title where you had subheading that said, "A Call to Arms." That's pretty cute, actually. The radial is in the arm, isn't it?

MALCOLM BELL: Yes, so no coincidence there. No, we actually gave that some thought. I thought it was, really, just an attempt to really get people's attention. And it so often happens that you read a title and something catches you. So we thought that it's very relevant.

BERNARD GERSH: Do you think this is something that has not had enough attention?

MALCOLM BELL: Absolutely. I think we're seeing more published recently more discussion, but in terms of actually bringing it into your practice, I think we still have a long way to go. And so we thought that this was a great opportunity to really showcase and to highlight the technique and the data. Mac put together a beautiful argument in favor of the transradial approach. And we're talking about STEMI patients.

BERNARD GERSH: Yeah, I think it's important, again, that this is not elective angioplasty. It's STEMI. Mac, what are the advantages? And then, obviously, I'm going to ask you what the disadvantages are. But let's start off with the advantages.

MACKRAM ELEID: Sure. Well, there's been several studies now, three randomized controlled trials, and meta-analyses, and also registry studies that show that access site-related bleeding is reduced with the transradial approach in STEMI. Generally, that's hematomas, vascular complications like pseudoaneurysms and those types of things. And several of the studies have also shown that mortality is reduced as well. So in-hospital mortality is lower in patients with the transradial approach.

BERNARD GERSH: So I think it's very understandable why the hemorrhage complications are less. But it really is you're making the argument for the fact that these bleeds are responsible for an increase in mortality. And there's always been this discussion back and forth. Is it the bleed?

It's a cause and effect. Or is it just that people that bleed are more fragile? They're older. They have other problems. Or is it bleeding itself that produces mortality and that increases mortality? The fact that these three trials have shown a reduction in mortality would certainly suggest the cause and effect relationship with bleeding. Would you agree with that?

MACKRAM ELEID: I think it suggests that. And there is still some uncertainty about the exact mechanism, but we know that bleeding is tied to mortality in patients with acute coronary syndrome. And there's more reduction of medication, so some of the antiplatelets will be discontinued. And then also, some of the clotting cascade is activated when bleeding occurs, so that could play a role in the mechanism potentially.

BERNARD GERSH: The other factor is that people who bleed get transfusions, and transfusions, they're not good for you. There could be another complicating factor. What was the extent of the reduction in mortality in these trials?

MACKRAM ELEID: Well, there was a 1% absolute risk for a reduction in mortality in the RIVAL study. And then I believe RIFLE-STEACS had about a 4% absolute risk reduction in mortality.

BERNARD GERSH: Were you surprised by that?

MALCOLM BELL: Well, I think if we just go back to your original question about the bleeding, we've known about the link, bleeding to mortality, for a number of years now. And we've always struggled trying to work out what is that link. How is it related? And I think there's a lot of confounders, and I think you've already brought up some of the important issues here. But here, we now have an intervention.

It's a technique. It's not a drug, but it's a technique that has shown a significant reduction in reduction in bleeding, which then has led to a decrease in mortality. And if we think about those numbers, I think that perhaps we shouldn't be too surprised. There's still a concern there about, is it the patient that's really at high risk of bleeding so they have a higher risk of mortality? I don't think we can answer that, certainly not today.

But if we think about those absolute differences, let's put it in other numbers. The number needed to treat, to save a life, in those trials and the meta-analysis, is about 50 patients. So that's substantial.

BERNARD GERSH: That's substantial.

MALCOLM BELL: And we're talking about number needed to treat probably to decrease a major bleed and to save a life, again, about 40 to 50 patients.

BERNARD GERSH: That's very substantial and very impressive. I mean, that really is. If you look at that in the light of many other current treatments, that's a big difference. So what are the disadvantages? Obviously, we'll get into why it's taken us so long to get to this point. But what are the drawbacks or potential drawbacks?

MACKRAM ELEID: Yeah, historically, there's been a lot of reluctance to use the transradial approach for STEMI patients because of the longer procedural duration and then the higher amount of experience required to use the transradial approach. And then also, perhaps more delays in door-to-device time. But all of these studies--

BERNARD GERSH: And what sort of magnitude?

MACKRAM ELEID: Right, the magnitude is, well--

BERNARD GERSH: The magnitude of time of prolongation with the radial technique?

MACKRAM ELEID: In the NCDR registry that just came out, the data from NCDR, there was about a four minute increase in the door-to-device time with transradial.

BERNARD GERSH: But that shouldn't make a difference. Right now, door-to-balloon or door-to-device times have shortened so much nationally that we've got room to play with. I can't believe that four minutes would make a difference.

MALCOLM BELL: And so we were seeing here that door-to-balloon time, your again, your recent analyses haven't really shown that it's decreased mortality. But this is perceived as one of the disadvantages. And again, I think that's one of the points to make here. We're not really talking about a three or four minute difference. This is in experienced hands.

BERNARD GERSH: You did allude to the fact that it's more difficult. It is a learning curve.

MACKRAM ELEID: Right, and that's one of the points that we were trying to bring out, that call to action that we raise awareness that this appears to be a safer technique, and so that we start using it more for more basic cases. And then, slowly graduate up to the ACS patients as well. And I think the experience in our cath lab has been that experienced operators in the femoral approach will adopt the transradial pretty quickly. They master those skills quickly.

BERNARD GERSH: Yeah, I accept that, but we also have to accept it's taken us an awful long time to get to this point. Even with elective PCI, the radial approach was being advocated, what, 15 years ago, more than that

MALCOLM BELL: 20 years or so.

BERNARD GERSH: And for STEMI, and it is, for instance, the use of the radial approaches has been far more widely used in Europe than it has in the United States, and some of the very early work in North America came out of Canada, not the US. From Edmonton, I think, was one of the first very large theories of the radial approach. So what is it about the US that's really resulted in, has created, this delay? It's a long time. It's always come out, well, we do it in Europe, why don't you?

MACKRAM ELEID: Yeah, I think the reasons aren't completely clear, but we think that, for one thing, that there's not all training programs train in the transradial approach, for one thing. And there's still a lot of concerns from people out in practice about whether or not transradial is feasible for STEMI population. There's concerns about not being able to use larger guide catheters, only having up to 6 French available, things like that.

MALCOLM BELL: I think some of the equipment that has been available in some of those countries was in advance of what was available here.

BERNARD GERSH: Oh, really?

MALCOLM BELL: So that really changed things. So when we first started doing radial approaches, just the introducer sheaths, for example, the big problem is you're avoiding a spasm. And I think we've pretty much overcome that in most patients now. But as usual, there's always a lag of getting that equipment into this country. But I can't really guess what the difference is between the European interventional cardiologists and the US interventional cardiologists.

It may be just a coincidence. It may be that, in a few pockets, in a few places in Europe, they really had physician champions of this technique and really pushed it. And it just happened to be the right people in the right place with the environment that was prepared to accept change. And I think we see this a lot in other areas of medicine in America.

BERNARD GERSH: Yeah, it must be, because US physicians and interventional cardiologists are not conservative by nature. They're aggressive, and they're aggressive in adopting new approaches. So it's interesting that there's been this really big lag period.

MALCOLM BELL: Yeah, and Bernard, I can tell you that in our own lab, now we have tremendous support, particularly from our allied health staff. But when we first started trying to adopt this, there always seemed to be some barriers just to get this changed. So you really need to have people who champion this. And I think, generally, this does come from younger individuals as well.

BERNARD GERSH: Do you think that-- I do want to leave some time for some discussion about the patients who should not have the radial technique-- but before we get there, do you think it would be appropriate or defensible to not train people in the radial approach in individual training programs in three years time? Do you think every program will offer this, should offer this?

MALCOLM BELL: Should, I think. It's a great question, and I think, in fact, we addressed this to some extent in this article. I think that, certainly among our junior colleagues and trainees, I think it's become an expectation that they're going to learn the transradial approach. I think it's important.

BERNARD GERSH: When you get randomized trials showing a reduction in mortality reduction and a reduction in bleeding, it seems almost inconceivable that one can ignore that.

MALCOLM BELL: So I think that absolutely, and I would agree 100%. But I think that we've got to be very careful that we don't say the transradial is just taking over from transfemoral, and the transfemoral approach is dead. There are times that you would use them, and we can talk about this in a few minutes. So I think it's important that you're properly trained in both approaches.

But I think to make the point here, what if, if you go back to the question about decreasing bleeding decreasing mortality, think about if this were a drug. And you showed number needed to treat was 50, and you were seeing 40%, 50%, 60% reductions in these major endpoints, we would want to be using that drug. It would already be in the guidelines. And currently, this is not even in the guidelines. And so I think it's really fascinating.

That was the reason. We can be perhaps provocative here, but I think we need to have people talking about this more.

BERNARD GERSH: So it's going to be time to change the guidelines. I think that clearly can't be ignored. Can you just, a few words of caution, just to finish off. We've got just a couple of minutes left. Who should not be treated with the radial approach right from the get go?

MACKRAM ELEID: Right from the get go, I think in patients that are the advanced elderly, there's going to be a higher risk of significant tortuosity in the arm vessels that may make an operator want to start upfront with the femoral approach. And then the other issue is the patient that comes in that's already in cardiogenic shock. Now, there's still an argument for transradial in that population as well and putting in a support device simultaneously from the femoral approach. But what are your thoughts, Malcolm?

BERNARD GERSH: What about people with peripheral vascular disease?

MALCOLM BELL: I think they're always a challenge, whether it's femoral or transradial. But I think that Mac is absolutely right. They're very odd. These are the ones that become more of a challenge sometimes. They may have arterial anomalies, a lot of tortuousity. In some high volume transradial labs, they'll routinely go from the left arm.

But just remember, these are some of the highest risk patients. These are the elderly patients. They are at higher risk. So I don't think we should just automatically go and do a femoral approach on them. I think what we need here is just some common sense.

You need to be experienced in this technique. This is not something that you learn overnight and start doing in STEMI cases. But in experienced hands, I think it's very reasonable to start with a radial approach. And if it's clear that you're running into problems, there should be a certain time where you say, OK, we're going to stop, and we're going to go through the transfemoral or the other radial.

Who else perhaps shouldn't have this? We talked about cardiogenic shock. Again, we typically, our high volume operators, will go transradial and leave the femoral approach for a support device if needed. And I think the patients who, clearly, doesn't have a radial pulse, that's obviously femoral of course. Or someone who's got multiple bypass graphs, and those cases clearly take longer from a transradial.

BERNARD GERSH: Well, thank you both very much. Congratulations on the article. And thanks to our viewers. We hope you'll continue to watch these roundtable series which appear on heart.org [INAUDIBLE]. Thank you.

MACKRAM ELEID: Thank you very much about, Bernard.