- Hi, my name is Ravish Sachar. I'm the chief of heart and vascular services at UNC Rex healthcare in Raleigh, North Carolina. And, I was the principal investigator for the US, along with a global principal investigator, Tomas Zeller for the ranger DCB trial, comparing their ranger drug-coated balloon, versus a plain angioplasty. The device investigator, investigated in this trial was a Ranger™ DCB.

Device investigated

The Ranger™ DCB, is a drug-coated balloon coated with paclitaxel. It is coated at two micrograms per millimeters squared, and this device was compared to balloon angioplasty alone. The test device, the Ranger™, as I mentioned, contains paclitaxel along with a excipient called the TransPax excipient, which has proprietary and is mounted on an 0.018 sterling balloon platform. And that is a device that was tested, against balloon angioplasty in the Ranger trial.

Study design and patient cohort

So, this study was a randomised controlled trial multicenter prospective trial. It was a three to one randomised design with four, with three patients enrolled in the Ranger arm for every one patient enrolled in the PTR, it was single blind in design. And it was a superiorly design, designed for effectiveness designed to show superiority of the DCB as compared to the plain balloon. This trial had three components. One was the main randomised trial comparing the Ranger™ DCB to plain angioplasty alone. There were 376 patients enrolled in that design and that study, and that there were 278 patients who were enrolled in the DCB arm and 98 patients who were enrolled in the angioplasty arm. In addition to the main trial, there was also a pharmacokinetic substudy and also a long balloon substudy. The results of all three of these components, at one year have already been presented. And what we have now, our 2-year data on the Ranger II study.

Key findings

So what we found is that the benefit seen of the DCB in terms of superiority, and in patency, in terms of freedom from events, that was in a one year was maintained after two years as well. So what we found was that at, at two years now, as compared to what we found initially at one year, there was a continued improvement in patency compared to a ballon angioplasty alone, at the end of the follow up period at 760 days in a capital Meyer analysis, the primary patency was 79.1% for the Ranger™ balloon and 67.8% for the plain balloon. When you look at it in terms of freedom from TLR, which is most important for patients, that are 87.4% of patients, who received the drug coated balloon had no further interventions required at two years as compared 79.5% of patients who received the standard balloon, who did not require any further interventions at two years. And both of these, both the primary patency and the freedom from TLR were statistically significant differences. In addition to that, if you look at the substudies, now at two years of patients who are traditionally considered high risk, some patients at high risk would be women as compared to men patients with chronic total occlusions at the beginning of the procedure or patients with severe calcification. When you look at those three subsets, there were important findings there as well. So, starting first with the chronic total occlusion subset of which there were 80 patients in the trial, there was a difference in primary patency at, at the end of the followup period at 760 days of favouring the drug-coated balloon as compared to the angioplasty plain angioplasty alone, with 69.4% patency at 70 to 60 days for the Ranger™ DCB arm versus 54.5% patency for the plain balloon arm. And similarly, there was a big difference in freedom from TLR as well among patients with chronic total occlusions at the beginning of the study with 85.6% of patients with CTOs at the beginning of the study with no further interventions required at two years versus 62.8% of patients in the plain balloon arm required nor further interventions at two years. So a larger delta among these patients with chronic total occlusions, similarly, among patients with severe calcification, traditionally a high risk cohort, 194 patients in total with severe calcification defined as PACS, are grade three or four, primary patency at the end of the follow up period at 760 days at two years was 84.3% for the ranger arm versus 66.7% for the plain balloon arm. And similarly, a difference in freedom from TLR favoring, the DCB arm at 90.9% versus 79.6% for the DCB arm versus a PT arm respectively against significant differences in both arms. This is very significant. And that 90 close to 91% of patients with severe calcification had no further interventions required when treated with the Ranger™ DCB out to two years. And then finally, when you look at women versus men, there were 105 women enrolled in the study versus 173 men enrolled in the study. Traditionally women have had worse outcomes as compared to men, maybe smaller vessels being the reason, but in this particular study, there was no significant difference found between men and women in terms of outcomes at two years. So overall, what I would say is that we have now two years a continuation of the benefit that was seen at one year in terms of our overall patency in terms of freedom from TLR. But also if you look at high risk subsets, the benefits are favourable as well. Patients with chronic total occlusions at the beginning of the procedure did better. And the delta and the difference as compared to plain balloons was more patients with severe calcifications did better as compared to plain balloon when treated with drug-coated balloons. And the difference was larger, as compared to the overall cohort and women and men. The results was exactly the same. And the final thing I would add is that at two years, there was no difference in mortality, between the two groups. This has been, something that's been followed closely. We don't have five-year data for this yet, but at least at two years, we now know that there's no difference in mortality between the drug-coated balloon arm versus a plain balloon arm.

Suggestions for use of this DCB

So we now know that, patients with femoral popliteal disease who are treated with drug-coated balloons overall, we know that, those patients do better than angioplasty alone. That has been well-established. We also don't know that this is not a class effect and that the benefit seen of the drug varies between the platform that is used, the benefit of the Ranger™ DCB at one year, as compared to angioplasty alone was pronounced. We now know at two years, it's pronounced as well. Those patients who are at high risk do especially better with drug-coated balloon versus plain balloon. And we know that it's safe. So for patients who have significant femoral popliteal occlusive disease, treatment with a Ranger™ DCB can be done safely with the expectation that there will be an effective response among patients overall, but also among patients at high risk for restenosis, such as CTOs, such as patients with severe calcification and equivalent results between men and women.

Take-home messages

So the key take home messages from this trial is that for physicians who are treating their patients with occlusive femoral popliteal disease, they can be confident, that when they treat their patients with the Ranger™ DCB, even among those patients with high risk features such as severe calcification or CTOs or among women, that they can expect to have good results in terms of patency and freedom from TLR, with good safety after two years. And this, two year data gives them the confidence, that they can do this safely for their patients.