**Title: TCT 22: FAME 3: FFR-Guided PCI Vs CABG in Pts With Multivessel CAD**

**Participants: Dr Yuhei Kobayashi**

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**Dr Yuhei Kobayashi**

"- Hi, I'm Yuhei Kobayashi, from New York-Presbyterian Brooklyn Methodist Hospital, as well as Weill Cornell Medicine, interventional cardiologist.

**Reasoning Behind This Study**

First of all, we didn't have that much evidence in terms of comparing three vessel coronary artery disease population between PCI versus Coronary Artery Bypass Grafting, especially in the newer generation drug-eluting stents, with fractional flow reserve-guidance. There was original paper published in New England Journal of Medicine last year, which was presented in TCT Late-Breaking, last year. Comparing 750 patients three vessel CAD in PCI versus 750 patients undergoing CABG. And the result at that point original trial design was no inferiority design hoping PCI was no inferior to CABG, which was not the case. So in this particular substudy, what we have looked at is two-fold.

**Study Design**

Number one, we first of all, looked at how anatomical complexity called syntax score affects the outcome of the PCI compared to CABG. Also as well as when we integrate FFR information which is called functional syntax score, which by measuring FFR and then eliminating FFL negative regions and we count syntax score again and then called functional syntax score. And then one of the purpose is to look at if the functional syntax score is better for the outcome post-PCI compared to CABG, that's number one. And number two, we also looked at if the post-PCI FFR predicted the outcome of PCI, as well as intravascular imaging guidance in this PCI cohort, improving the outcome of the PCI.

**Key Results**

When we looked at the functional complexity of coronary artery disease, first of all, syntax score is being shown to be predictable of outcome post-PCI, but not post CABG, which was replicated in this cohort. When we look at the syntax score, which was not predictive of CABG cohort, but syntax score less than 22 is very different from higher than 22 in PCI cohort. And actually if the syntax score is less than 22, PCI even did better than CABG. And then when we calculated the functional syntax score in the PCI cohort, functional syntax score less than 22 was about 50% of population. And then the outcome of PCI was almost identical to the CABG. So the results suggest not only syntax score, but integrating FFR and calculating functional syntax score actually captures more population, which has a good outcome after PCI compared to CABG. When we looked at the post-PCI FFR, if the post PCI-FFR is high, which is actually a better outcome compared to post-PCI, FFR is low. And in this phase three study, we did not mandate the measurement of post-PCI FFR, but in the future, when we are optimising the PCI with FFR, we can probably measure FFR after the PCI. And if it's low, we try to achieve a higher value, and then that may improve the outcome of PCI. And also in the FAME study, which we were criticised that the intravascular imaging guidance was not utilised very well. And then about in about 12% of sub-population, either IVUS or OCT was used to guide PCI. And in this cohort, compared to another 88% or so population, the outcome of PCI was similar irrespective of PCI was guided by intravascular imaging or not. Those are the key messages.

**Suggested Treatment Options for Patients in This Cohort**

So first of all, when we encounter three vessel disease coronary artery disease population, which is anatomically three vessel disease and then we typically calculate syntax score to risk stratify PCI, or CABGs better in this population, but now we have FFR information integrated and we can calculate functional syntax score by doing that. We can capture about 50% or so patient of three vessel disease angiographically do well after PCI compared to CABG. So then I think in the modern approach, we do angiogram and then we do physiology, and if the functional syntax score is lower than 22, I think we can tell our patient that the outcome of PCI is similar to CABG. But if it's higher than 22, we might recommend the patient to go to CABG because this is clearly better outcome. And also post-PCI, in the future, by optimising the PCI using FFR, we can achieve better outcome. And then we don't know at this point integrating imaging in this cohort was not necessarily improving outcome, but again, this was a small population which may have shown different result if we have more patients who has been guided by intravascular imaging.

**Further Study Needed**

So first of all, in this FAME 3 study, we show that the PCI overall was not non-inferior to CABG, in this modern technology including the latest drug-eluting stent, also a systemic physiology guidance. But we noticed half of them, half of the three vessel disease population do similar to CABG if the anatomical and functional complexity was not that high. But again, in this population, unfortunately intravascular imaging was not systematically utilised or post-PCI physiologic assessment was not really mandated. So I think these are the knowledge gap and the future direction will probably enforce in this population by integrating more systematic intravascular imaging guidance, as well as systematic post-PCI physiologic assessment and then achievement of the pathic results of the PCI. Then our PCI results would be even better down the road.”