- My name is Shannon Thomas. I'm a vascular, endovascular and renal transplant surgeon at the Prince Of Wales Hospital. And I'm also a senior lecturer at the University of New South Wales in Sydney, Australia.

Importance of this Study

The real importance of this study is that if you have kidney failure, or if you have a patient that has kidney failure, then in most countries around the world, the way that they are going to stay alive is with dialysis. And even though transplant is the best way, most people end up on haemodialysis. And that is where two needles are put into a fistula or an enlarged vein, usually in the arms, one needle takes the blood out into the dialysis machine, filters it, and then sends it back through the second needle. Now, the problem is that making a fistula for a patient, it's actually difficult. And there was a meta-analysis in 2017 in the European Journal of Vascular Surgery that showed some 22% of fistulas were only working at six months. So the majority of fistulas that were made never worked and about 21% were just abandoned without any form of revision. So that's a real problem. And where this paper, where this study finds its importance is in addressing that issue, where we joined the artery to the vein to make the fistula for the patient. And then we use stents or balloons to cause it to grow into something that is useful, such that at six months 94% of fistulas are good to go. They're ready to be used, or they are already being used. And so it's a massive paradigm shift in the way that patients with haemodialysis dependent kidney failure are managed.

Study design and patient population

So we performed a retrospective single cohort study of patients who had never had any vascular access before, who presented to our institution over a six-year time period for vascular access. So these patients basically had developed kidney failure for the first time in their lives. And we made a fistula for them. And we then collected all of their data prospectively, but we conducted the data analysis retrospectively, looking at the type of fistulas that were made, how well those fistulas functioned, when they reached maturity, and then we looked at the time to either reocclusion or restenosis, as well as the number of interventions we had to perform to keep those fistulas running.

Key Findings

So the key findings from this study was that at six months, 93.9% of fistulas were mature, and either being used or ready for use. Now, it's a story as to how we got that. So we formed 82 fistulas altogether. We followed them up at 46 days. And at that 46-day time point, on average, 49 were ready to go. 33 of the fistulas were immature. And 14 of them, we watched and waited. 19 of them we proceeded to perform ballooning or stenting such that off the original cohort, only five patients did not have a mature fistula at six months. The second important finding then was the patency. So after reaching maturation before year primary functional patency was 34%. So 1/3 of those fistulas just did not require any intervention again. However, after performing a simple balloon angioplasty or stenting, the four-year assisted functional patency was 83%. So this meant we only had 12 thrombosed fistulas. And in fact, all of those thrombosed fistulas were salvaged such that at four years, we had not lost a single fistula at all. So of all the patients that came to us, that we were able to create a matured fistula in all of them, had a usable fistula as long as required. And this came at a cost of 0.37 endovascular procedures per patient per year.

Impact on practice

Well, I would like to see people changing how they view vascular access for patients. At the moment, people will try to make a fistula. And when it fails, rather than trying to make that original fistula grow and work, they revise it, they go elsewhere. And it means that there are a lot of people in this world who have had a history of multiple fistulas on their body, and multiple grafts, and multiple temporary access devices like permacaths. And I think it's really incumbent on my colleagues and health professionals to make a fistula for a patient, and then either have the skills themselves, or send it to someone who does to make sure that that original fistula can be turned into a mature fistula, such that then the patient will keep that original fistula for the rest of their life, and not need any other sort of access like an AV graft, or a permacath, things that we know are associated with premature death. So I think the interpretation of this really is that the formation procedure, and the ballooning, and stenting procedures that we use to keep a fistula mature or to make a fistula mature, have to be seen within the one frame and one cannot happen without the other. And I think if you do this, you will find very quickly that your population of patients will all be dialyzing through their first fistula that you have created for them.

Further study required

I guess I would like to see this now being conducted at multiple sites. There are many different keys that we have put into place to achieve these results. We've got an open access vascular clinic that patients can come to, that we can monitor patients at. So we've adapted our health system and we've also adapted the techniques, but every country is different. Every health system is different. And so the model that we've created needs to be adapted for those health systems. And so what I'd really like to see is people repeating this study, but adapting it to their local conditions. But again, still trying to integrate the ballooning or stenting procedures, these endovascular procedures with the original formation procedure. And I think, yeah, the more repetition we get, the more confident we will be that we can have all of our patients dialyzing through the first fistula we made for them.