Doppler ultrasound surveillance of recently formed haemodialysis arteriovenous fistula: the SONAR observational cohort study

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Plain language summary

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Plain language summary

What was the problem?

For people with advanced kidney disease, haemodialysis is best provided by an ‘arteriovenous fistula’, which is created surgically by joining a vein onto an artery at the wrist or elbow. However, these take about 2 months to develop fully (‘mature’), and as many as 3 out of 10 fail to do so.

What was the question?

We asked whether we could use early ultrasound scanning of the fistula to identify those that are unlikely to mature. This would allow us to decide whether it would be practical to run a large, randomised trial to find out if using early ultrasound allows us to ‘rescue’ fistulas that would otherwise fail.

What did we do?

We invited adults to undergo serial ultrasound scanning of their fistula in the first few weeks after it was created. We then analysed whether we could use the data from the early scans to identify those fistulas that were not going to mature by week 10.

What did we find?

Of the 333 fistulas that were created, about two-thirds reached maturity by week 10. We found that an ultrasound scan 4 weeks after fistula creation could reliably identify those fistulas that were going to mature. However, of those fistulas predicted to fail, about one-third did eventually mature without further intervention, and even without knowing what the early scans showed, another third were successfully rescued by surgery or X-ray-guided treatment at a later stage.

What does this mean?

Performing an early ultrasound scan on a fistula can provide reassurance that it will mature and deliver trouble-free dialysis. However, because scans are poor at identifying fistulas that are unlikely to mature, we would not recommend their use to justify early surgery or X-ray-guided treatment in the expectation that this will improve outcomes.
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