New drug-eluting stents very promising

December 5 2017, by Berend Meijering

New-generation stents containing anti-vasoconstriction medication perform well. They are safe and efficient for most patients, over both the short term and the long term. According to Liefke van der Heijden, a trainee cardiologist at the Medisch Spectrum Twente hospital, future research into stents may focus on high-risk patients or those with complex lesions. She will be awarded a PhD by the University of Twente's Faculty of Behavioural, Management and Social Sciences (BMS) on Wednesday 6 December. Her doctoral thesis is titled Second-generation drug-eluting stents and beyond.

Drug-eluting stents (DES) have become an indispensable element in the treatment of coronary artery constrictions. In many cases, keeping coronary arteries open by inserting small, drug-containing tubes is an alternative to major heart bypass surgery. The steady stream of new developments means that stents are progressively becoming safer and more effective. Second-generation stents are already outperforming the first generation devices. They are biocompatible, so there is less risk of an inflammatory reaction, of blood vessel constriction, and of potential new constrictions developing in the coronary artery. The ongoing development of stents has brought an added benefit – the platforms have become more flexible, which has made it much easier to position them. This is particularly useful in the treatment of coronary artery constrictions where the type and extent of the lesions involved makes it more difficult to position the stent.

Dr Van der Heijden's research focuses on second generation drug-eluting stents, and the more recent generations. Both short-term and long-term

follow-up show excellent results in terms of safety and effectiveness. Her doctoral thesis also covers the latest research in this area. The stents that are currently under development include a category that is partially bioresorbable (biologically soluble) and another that is completely bioresorbable. The partially bioresorbable stents are already showing good short-term results. However, there is some debate concerning the safety of the first generation of fully bioresorbable stents. In theory, they are very promising but, as yet, nothing is known about their potential long-term benefits. Studies are needed to find out how their short-term results can be improved.

After stenting, some patients are at greater risk of an adverse outcome than others. These tend to be patients who have had previous bypass surgery, patients whose treatment involved small vessels, patients with highly calcified coronary arteries and patients with a constriction at the point where a coronary artery branches. Certain stent properties could provide better clinical outcomes for these groups in particular. This University of Twente PhD candidate feels that, given the high risk of blood vessel constriction (or re-constriction), future research should ideally focus on this patient population in particular.

Provided by University of Twente