Evaluate Vantage

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TCT 2016: Early clinical data back Medtronic’s inside-out stent

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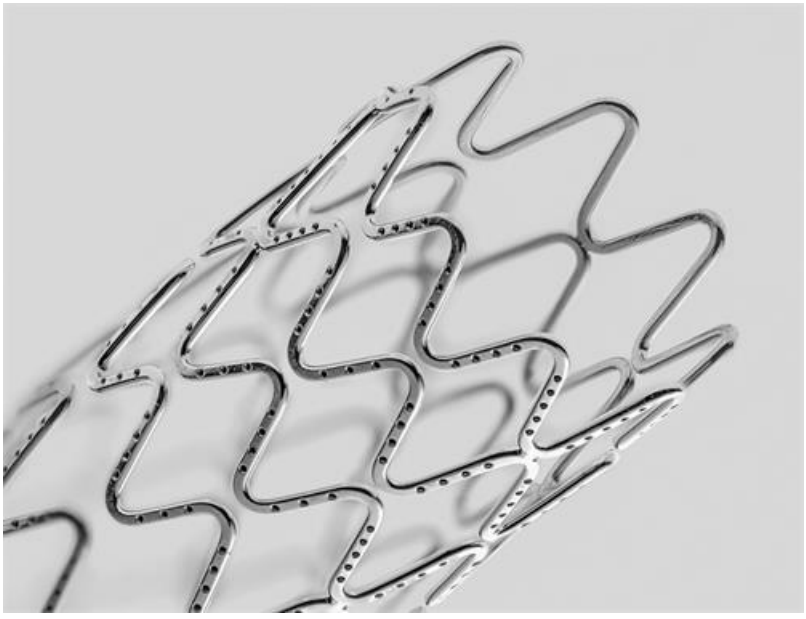
Stents coated with antiproliferative drugs have been an established technology for more than a decade – so it must be time to turn them inside out. Early clinical data on one stent with the drug inside it appear encouraging for its developer, Medtronic.

Known simply as the Drug-Filled Stent (DFS), the device proved effective in its first human trials when compared with historical data on Medtronic’s current drug-coated stent, Resolute. With various dissolving polymer scaffolds having gained approval but disappointed in postmarket trials, Medtronic seems to be banking on a different approach to innovation in this space.

The main point of this device is to do away with the polymers that are generally used to stick the drug coating to the stent itself. These polymers have been linked with side effects including inflammation and hypersensitivity reactions. Several companies have attempted to develop polymer-free stents, but none of these devices has been able to sustain the release of drugs over the three or four months needed to inhibit restenosis.

A technological RevElution?

The wire from which the DFS is formed is made up of three layers. The outer layer is cobalt chromium, like Resolute. This is followed by a very thin tantalum layer designed to confer radiopacity, and the inner core of the DFS is made of silver. Following production of the stent, the silver layer is dissolved chemically, leaving an internal reservoir coated with the cytostatic agent sirolimus.



Tiny holes are then laser-etched on the abluminal side of the stent, providing a way for the drug to leach out into the vessel wall. Medtronic says the size of the holes – 20 microns in diameter – gives the stent similar elution characteristics to polymer-based stents.

Early clinical data, presented yesterday at the Transcatheter Cardiovascular Therapeutics meeting in Washington, DC, are hardly conclusive, but at least give Medtronic reason to continue development. Results from the first 50-patient cohort in the 101-patient RevElution trial showed that at nine months the DFS had in-stent late lumen loss – the difference between the diameter of a stented vessel immediately post-procedure compared with the follow-up angiogram – of 0.26mm.

This was non-inferior ($p<0.001$) to historical data from the pivotal US study of Resolute, which showed nine-

month in-stent late lumen loss of 0.36mm. No cases of binary restenosis or thrombosis were seen though one patient, who had stopped antiplatelet therapy for a surgical procedure, had target lesion failure.

A Medtronic spokesperson told *EP Vantage* that the device could gain CE mark in 2019.

The DFS sale

The initial clinical data are positive, but the patient numbers are small, and using a historical control is not the most rigorous evaluation. But the drug-eluting stent space is now largely commoditised, and developers are chasing new innovations in an attempt to jump ahead of rivals.

This can be risky. By far the most eye-catching innovation in this space for many years has been Abbott's dissolving vascular scaffold, Absorb, approved in the US in July. But in subsequent studies, designed to prove its worth over older technologies, it has been rather a let-down.

Three-year clinical data from a 500-patient European postmarketing study, Absorb II, were also presented at TCT, and showed that the bioresorbable scaffold was not as good as Abbott's market-leading metal-based Xience drug-eluting stent. The trial missed both co-primary endpoints, superiority of vasomotion and non-inferiority in late loss, and there were six cases (1.8%) of very late stent thrombosis – blood clots occurring a year or more after implantation – in the Absorb arm versus none in the Xience group.

Abbott was already struggling with poor adoption of this new technology, and the new data will not help. With the established devices competing on price there is little chance of selling a new product at a premium. Backing an entirely new technology is not necessarily a bad idea, but Medtronic will need markedly better results with its new approach if it is to carve out a place for it on the market.

Trial name	Trial ID
RevElution	NCT02480348

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