Help for coronary vessel constrictions – Tübingen cardiologists have developed an alternative to drug eluting stents

Prof. Christian Herdeg at the University Hospital of Tübingen has developed an alternative approach for intracoronary pharmacotherapy for the treatment of patients with constricted coronary vessels. Localised drug delivery using special catheters is far superior to the use of uncoated stents and is also a way of avoiding the disadvantages of coated, i.e. drug eluting stents. For patients with existing or recurrent stenoses, the new method, which has just been tested in a clinical trial, offers promising possibilities. On 16th April 2009, the new method was awarded a prize at a meeting of the German Society for Cardiology in Mannheim.

Coronary vessel constrictions (stenoses) are a serious health problem. Patients suffer from chest pain and distress, and in the worst cases life-threatening infarctions may even result. Stenoses can be treated with the insertion of stents, small lattice tubes that support the vessels from the inside and keep them open in order to allow the blood to flow through. Folded stents can be accurately placed in the heart using a heart catheter.

However, the long-term effectiveness of stent implantations is limited due to new constrictions (restenoses) that tend to occur following coronary interventions. Stents coated with a drug that prevents, or least delays, restenosis were developed as an alternative approach to standard stents. However, these coated stents are also associated with some disadvantages. In addition to the reaction of the vascular wall to a foreign metal object, the drug coating prevents the implant from becoming integrated into the vascular wall, resulting in sudden constrictions caused by blood clots. Furthermore, in the case of coated stents, only the vascular wall regions that are in direct contact with the stent lattice are in contact with the drug; the gaps between the metal grids have no contact with the drug.

Heart specialists at the University Hospital in Tübingen have developed an alternative approach that combines the advantages of uncoated stents with the advantage of homogenous drug transfer to the vessel wall as a whole, thereby also avoiding the potential disadvantages of coated stents. The new strategy, which is currently only used at the University Hospital of Tübingen, involves the insertion of an uncoated stent and the subsequent transfer of the drug to the whole vessel wall with a catheter. The use of a special catheter enables a complete moistening of the constricted area at the same time as enabling the stent to grow well into the tissue.

Prof. Herdeg

"I have been focusing on catheter-based drug delivery since my doctoral thesis," said Prof. Christian Herdeg, the inventor of the new method. Herdeg has already received four prizes for this innovative method. On 16th April, the 42-year-old cardiologist received the Andreas Grüntzig Prize along with a cheque of 5,000 euros. This prize is the most prestigious prize awarded in the area of interventional cardiology.

Herdeg's method is already being routinely used at the Tübingen University Hospital and the benefit of the method has been confirmed in a recent clinical study

involving 204 patients (LOCAL Tax Study). "We have not only been able to help patients who need a stent, but also patients for whom the implantation of a stent is ineffective or impossible." The method involves the expansion of the constriction with a balloon, followed by treatment of the area affected with drugs. The drug paclitaxel has been seen to have a long-term effect, even after a single administration.

The new comparative study has shown that the method is superior to the method using uncoated stents and leads to results that are as good as those achieved with a drug eluting stent without, however, being associated with the disadvantages of the latter. "This is a clear improvement for our patients," said Prof. Herdeg.

The method is also suitable for patients who already have a stent and who require a second one due to a recurring constriction at the same site. Balloon-assisted drug application often renders a second stent unnecessary.

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