

Composite polymeric clip could revolutionise how surgeons treat aneurysms

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A product developed by German and Spanish partners could revolutionise how surgeons treat one of medicine's more mysterious conditions.

For such a common illness, there remain a lot of things we don't know about aneurysms. We still don't know exactly what causes them. We don't know when or why one aneurysm bleeds or when and why another will not. They are often symptomless and so we may not even be aware that there is a ticking time bomb growing inside of us.

With so many unknowns, Spanish company NEOS Surgery decided it was time to make at least one part of the patient's journey less uncertain and so the InnoClip project was born.

With the help of ADETE (Advanced Engineering & Technologies GmbH) and Institut für Verbundwerkstoffe GmbH (IVW) through EUREKA's Eurostars programme, they developed a tiny plastic clip which clamps and removes potentially life-threatening aneurysms.

"Sometimes, for reasons which aren't always clear, there might be a weak or dented point in the arteries (or walls) of our blood vessels. This dent can become filled with blood and then trapped, a bit like the way air gets trapped in a balloon. If this eventually bursts, it can lead to life-threatening blood hemorrhaging in the brain. This is how aneurysms work," says Ana Rodríguez Alonso, the R&D Project Manager at NEOS Surgery.

But at the moment, Ana explains, the current approach to removing these [aneurysms](#) is flawed.

"Surgeons implant a metallic clip which behaves a bit like a clothes peg. It clamps the aneurysm shut so that no more blood can enter, and gradually empties the build-up of blood in the artery, removing the threat of a burst. But if we want to do a follow-up check on the patient to make sure everything is OK, things start to get complicated", she says.

Normally, a standard MRI and CT scan would confirm very quickly whether or not the clip was doing its job. But the x-ray imaging from these scans cannot accurately identify metallic elements and are therefore unsuitable for follow-up checks.

The alternative is to carry out an angiogram on the patient. However, this is a very aggressive, time-consuming and sometimes quite risky procedure which involves injecting a tube through the patient's skin.

"Our goal from the beginning with the InnoClip project, was to make a plastic clip of composite polymeric materials so that unlike the metallic clip currently being used, could be monitored by basic scans. In some cases, identifying problems quickly in this way could be the difference between life and death," Ana says.

The 1.2 million euro funding received through the Eurostars project has allowed the partners to carry out three years of intense research and development. Because even the smallest oversight can threaten a patient's life, the medical requirements for materials used for implants, like those in InnoClip, are extremely high.

"We wanted to work with the best experts we could find. We had worked with IVW before and knew that they had worked a lot very successfully with composite materials. And they put us in touch with

ADETE who had also worked with medical materials before and focused primarily on the design of the product," Ana says.

The consortium has produced a prototype clip which is currently being manufactured and tested. But this is only the beginning of the journey. The next step is to get the product on to the market. And in this field, the most important thing for NEOS Surgery is that the product develops an excellent and reliable reputation.

"The most difficult thing is to convince surgeons to begin using the product. They are naturally very cautious of changing because they need to be absolutely sure the product is reliable. But the funding from this project has already given our reputation a huge boost. As a result of InnoClip, our product won the Innovation prize at the JEC World Conference this year," Ana says.

Going forward, NEOS Surgery are looking to gain a further foothold in the market and are currently negotiating with manufacturers and distributors of the well-established metallic clips, who might potentially begin to market the new plastic clip.

Provided by Eurostars

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