



Bioactive Device for Improved Vascular Aneurysm Occlusion and Healing

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WARF: P07117US

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing an endovascular device for improved treatment of vascular aneurysms.

Overview

As many as one in 20 people in the United States are estimated to have some form of cerebral aneurysm. The majority of cerebral aneurysms are treated from inside the blood vessel, which is referred to as the endovascular route. One such procedure involves packing lengths of thin metal coiling into an aneurysm to densely fill the cavity with coil loops that block, or occlude, blood flow to promote healing and prevent aneurysm rupture.

Unfortunately, use of these coils may produce numerous complications. Coil compaction over time can result in incomplete occlusion of the aneurysm, potentially causing subsequent aneurysm enlargement or even rupture. Unpredictable and incomplete healing associated with traditional coils also can lead to rupture. Larger aneurysms require time-consuming placement of numerous coils, leading to increased risk of fatality associated with the period in which a patient is under general anesthesia, as well as the procedural risk of imprecise coil placement. A method or device to overcome coil compaction, promote healing and reduce procedural time associated with coil placement is needed.

The Invention

UW-Madison researchers have developed an endovascular device for occluding a cerebral or vascular aneurysm. The device is composed of a single nickel-titanium coil surrounded by a bioactive polymer shell. Nickel-titanium is a shape memory alloy that allows minimally invasive delivery of the coil. The polymeric shell component overcomes the problem of coil compaction by supporting the coil, and also forms a barrier blocking blood flow into the aneurysm. Furthermore, the shell is composed of elastic, blood-compatible and bioactive material that stimulates regrowth and healing of the vessel wall.

When deployed, the device fills the aneurysm and causes contact between the wire stent and surrounding tissue. The bioactive polymer shell provides an isolated biological environment to promote accelerated and complete wound healing. The device allows for more precise, controlled aneurysm blockage as well as time-efficient device delivery, thus decreasing the fatality rate associated with traditional coiling treatments.

Applications

- Occlusion of cerebral and vascular aneurysms

Key Benefits

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- Overcomes problem of coil compaction with protective polymer shell
- Potential to decrease mortality rate associated with incomplete aneurysm occlusion and time-consuming delivery procedures



- Potential to stimulate regrowth of vessel walls and tissue healing/scar formation

Additional Information

For More Information About the Inventors

- [Kristyn Masters](#)
- [Wendy Crone](#)

Related Technologies

- [For more information about bioactive and biocompatible polymers for use in medical implants, see WARF reference number P07185US.](#)
- [For more information about the use of polymeric shells used as endovascular occlusion devices, see WARF reference number P08088US.](#)

Publications

- Xu F., Hart K., Flanagan C.E., Nacker J.C., Moftakhar R., Aagaard-Kienitz B., Consigny D.W., Grinde J.R., Crone W.C. and Masters K.S. 2009. A Hybrid Coil/Polymer Device for Occlusion of Cerebral Aneurysms. J. Med. Devices 3, 045001.

Tech Fields

- [Medical Devices : Neurological devices](#)

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