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Endovascular Occlusion of Vascular Defects Using Microcatheter Delivery of a Two-Component Polymer

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Invention Description

Endovascular polymer treatment is a relatively new and expanding field. Clinical uses include treatments for arteriovenous malformations (AVMs) and aneurysms. Current endovascular occlusion techniques use materials such as isobutyl-2-cyanoacrylate, polyvinyl alcohol, ethanol, hyaluronic acid gels, and cellulose acetate. These materials have many disadvantages, including their toxicity, requirement for organic solvents, and difficulty of application.

Researchers at Arizona State University and the University of Michigan have optimized the properties of the two-component polymer calcium alginate for use for *in vivo* endovascular occlusion. By optimizing its biocompatibility, gelled mechanical stability, and pre-gel viscosity, they were able to develop a material that could be delivered from microcatheters and could withstand *in vivo* blood pressures without dislodging or degrading.

This optimized alginate is a versatile tool for occluding blood vessels in many situations. Additionally, because calcium alginate fills the blood vessel lumen without adhering to the vascular wall, it does not cause tissue insult or exhibit the biocompatibility problems associated with polymer glues.

Potential Applications

- endovascular occlusion, such as for treating arteriovenous malformations and aneurysms

Benefits and Advantages

- Biocompatible
- occludes via mechanical blockage, with no adhesion to vascular walls that could cause tissue insult
- two liquid components have low viscosity for easy of delivery via microcatheters
- good mechanical stability after gelation
- does not require organic solvents

Intellectual Property Status:

US patent 6,592,566

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