A system for securing intraocular lenses during cataract surgery and other applications where sutures create challenges

Duke
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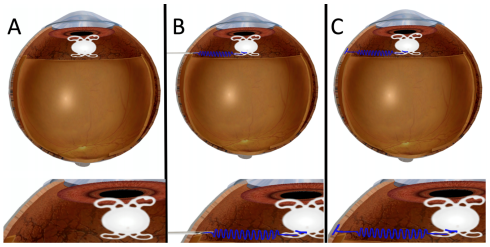

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Unmet Need

Suturing is a common method to close wounds and fixate devices. However, due to the inherent physical constraints of the intraocular cavity, forming knots within the eye to affix hardware or repair damaged structures with sutures is challenging and time-consuming. Specialist surgeons are often required to handle these difficult procedures such as secondary intraocular lens implantation or reconstruction of the iris. In cases where inferior techniques are performed, further damage to the eye such as glaucoma and corneal failure may occur. There is a need for a simpler method of holding tissues together to decrease operation time and increase safety of intraocular fixation techniques.

Technology

Duke inventors have reported a delivery system intended to replace sutures in situations such as secondary fixation of intraocular lenses during cataract surgery. Specifically, a memory material that can return to a designated shape, like nitinol springs that are used for treating aneurysms, is collapsed into the device. This memory material is then delivered across the tissues or materials meant to be fixed together in order to secure them once it expands and returns to its designated shape. For example, the inventors have described a device that uses a needle to pass through alternating edges of an iris defect to deliver a memory material polymer that forms a spring that will hold the tissue edges together.

Other Applications

In addition to applications in the field of ophthalmology, this technology may have broader use in endoscopic surgery and other minimally invasive procedures.

Advantages

- Could decrease operation time and improve safety compared to sutures for certain conditions
- Particularly useful for iris defect repair, secondary intraocular lens implantation and other intraocular procedures that require suture fixation
- Could be expanded to applications beyond suturing in ophthalmolog

Publications

- US Patent App 17/109,919