



Everting Pre-Shaped Soft Device for Access during Medical Interventions

Tech ID: 31933 / UC Case 2020-061-0

BACKGROUND

Tip-extending devices are a crucial element of medical devices used for surgical intervention. Conventional tip-extending devices navigate using manual and robotic instruments that must be pushed from the base. This type of movement increases the risk of dissection, because of potentially high levels of friction between the environment and instrument along its entire path. Previous tip-extending devices consist of a tip that is sealed off and inverted inside itself which limits accessibility to surgical sites. Standard instruments also struggle to traverse complex anatomical structures due to their stiffness and solid composition. Therefore, tip-extending devices with low levels of friction that can pass through complex anatomical structures are needed to improve surgical outcomes.

DESCRIPTION

Researchers at the University of California, Santa Barbara have fabricated a soft, tip-extending robotic device with a hollow channel and outer sheath that relies on internal pressure for safe and timely movement through the body. The device operates like a vine such that it extends at the tip while the rest of the body remains stationary with respect to the environment, minimizing risk of dissection. This vine acts as a delivery vehicle that pulls an instrument (such as a catheter) with the tip to the surgical site. When it reaches the final target, there is a hollow access channel and sufficient stiffness for treatment to be delivered. Additionally, the body of the vine can be formed and everted to match specific anatomical structures, enabling simple and efficient navigation of channels that were once too tortuous to perform surgery.

ADVANTAGES

- ▶ Minimizes risk of dissection
- ▶ Reduces time for accessing surgical sites
- ▶ Improves anatomical navigability

APPLICATIONS

- ▶ Medical Devices
- ▶ Surgical Procedures

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20240008939	01/11/2024	2020-061

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Soft Burrowing Robot for Simple & Non-Invasive Subterranean Locomotion](#)
- ▶ [Self-Anchoring Burrowing Device for Sensor Placement with Low Reaction Force](#)

CONTACT

Donna M. Cyr
cyr@tia.ucsb.edu
tel: .

INVENTORS

- ▶ [Hawkes, Elliot](#)
- ▶ [Morimoto, Tania](#)

OTHER INFORMATION

KEYWORDS

surgical device, medical device, tip-extending, anatomical navigation, surgery

CATEGORIZED AS

- ▶ **Medical**
 - ▶ [Delivery Systems](#)
 - ▶ [Devices](#)

RELATED CASES

2020-061-0

