

How variable stiffness can change the way we do Ear, Nose, Throat (ENT) surgeries

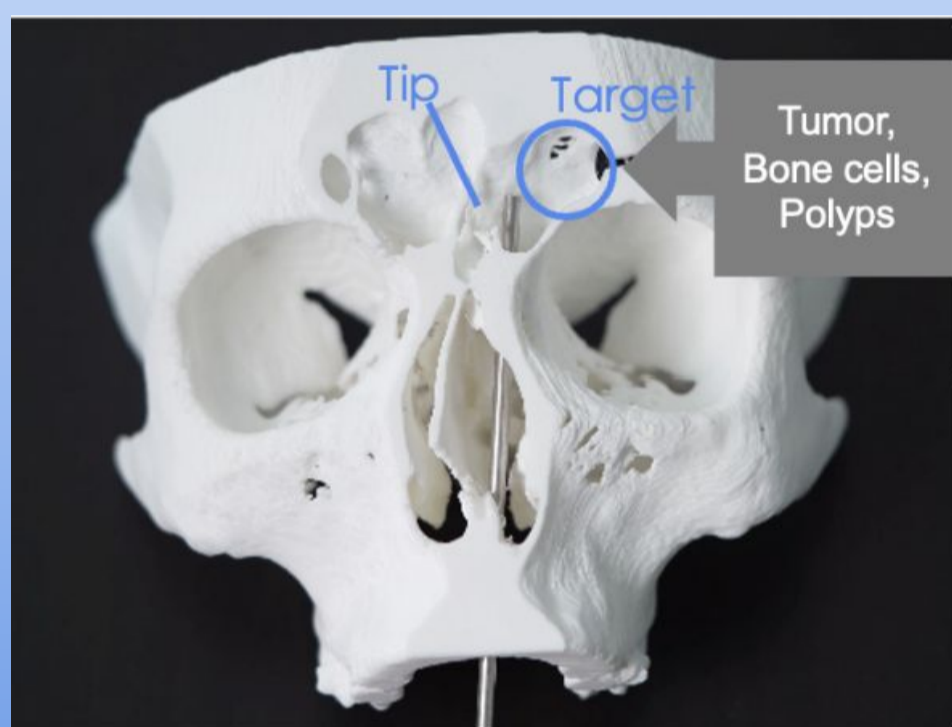
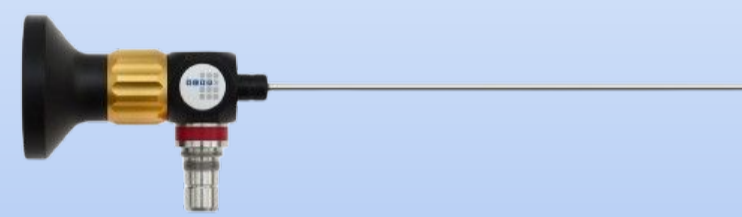
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Each year, several million surgical procedures are performed in the ear, nose, and throat (ENT) region. Due to the complexity of accessing these areas and the lack of suitable equipment, many procedures that could be minimally invasive are instead carried out as open surgeries. This approach makes operations longer and more complicated, increases the risk of complications, and results in higher costs for patients and the healthcare system.

What can you find on the market ?

Rigid scope and cold steel tools



- provide good stability and tissue dissection due to high force application
- cannot access difficult-to-reach areas

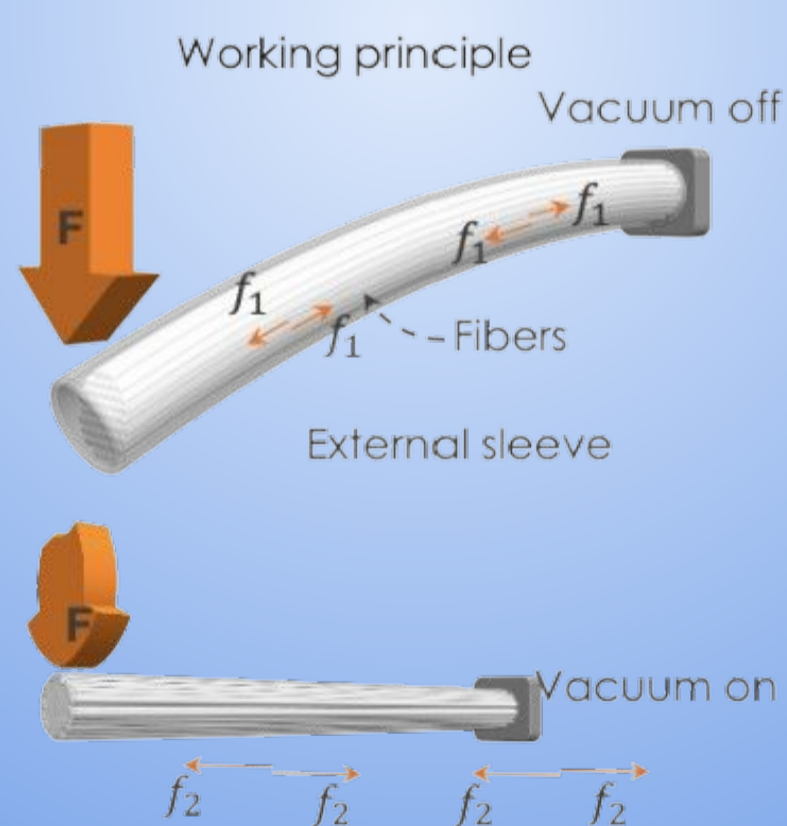
Soft scope



- can easily reach difficult-to-access areas
- Lacks the rigidity needed for forceful surgical use

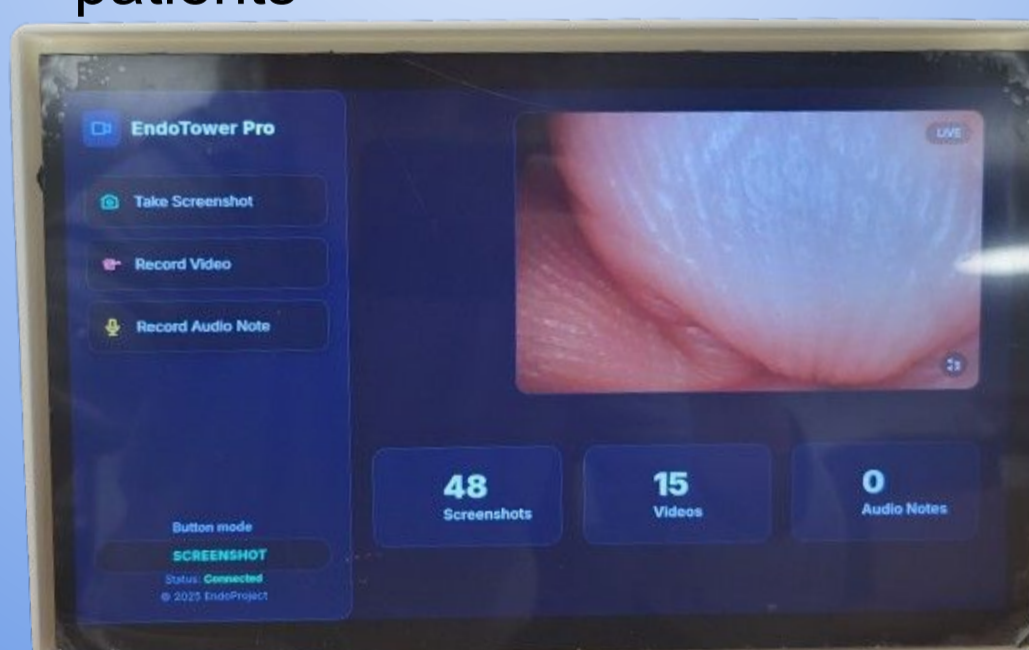
The solution : Variable stiffness

- soft state: copper and PLA fibers are free to move
- Rigid state : air is vacuumed, the external pressure squeezes the fibers together and increase the friction



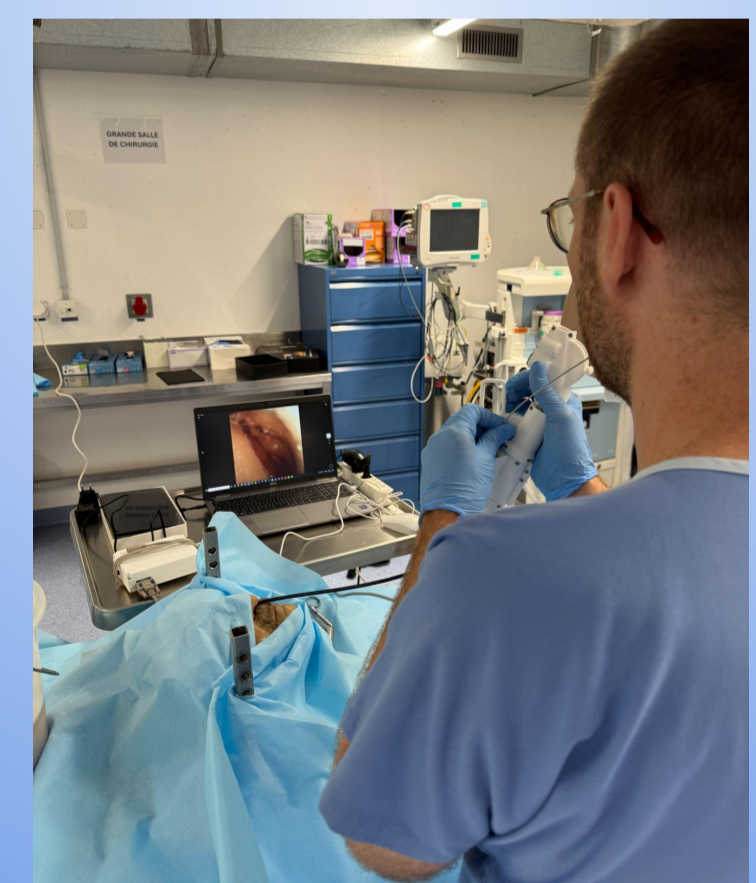
Creating an endoscopic tower

- user friendly interface for the surgeon, easy to use during surgical procedures
- Ergonomic and connected: The surgeon can take a photo/video by pressing one of the buttons on the endoscope and view the media on the interface.
- customised interface for surgeons with follow-up of each of their patients



Testing in real conditions

- Testing the endoscope and the endoscopic tower on cadavers with surgeons from the Centre Hospitalier Universitaire Vaudois (CHUV)
- The best way to obtain constructive feedback and improve the product alongside those who will use it.



Next goals / ideas

Endoscopic tower :

- Develop a model to help surgeons analyse what they see (tumours, veins, etc.).
- Create a 3D map of what is seen by the endoscope camera during the operation, in order to better follow-up the patient.

Endoscope :

- Develop a wireless endoscope
- Create an interface and endoscope that you can use with your phone, when you cannot access a real endoscopic tower