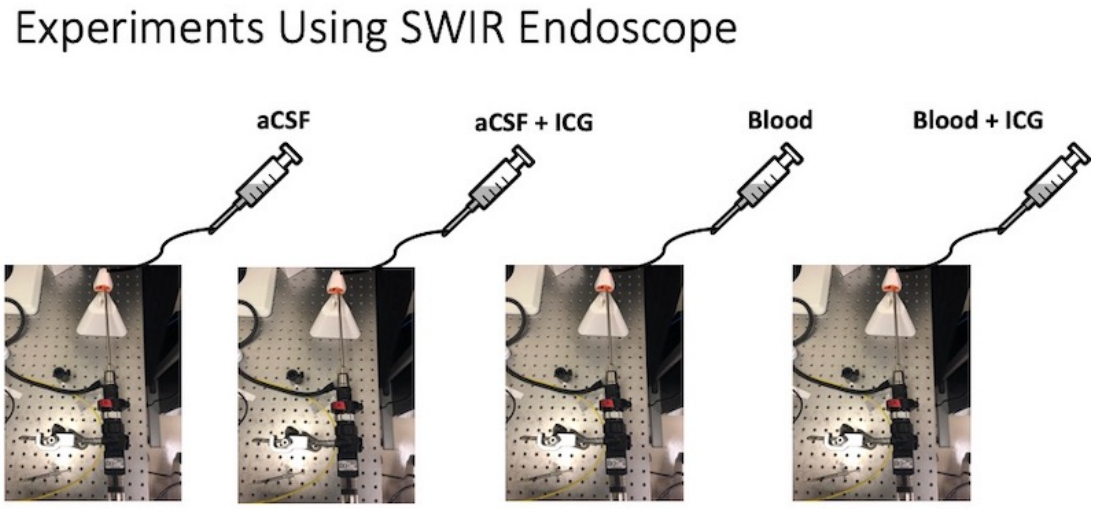
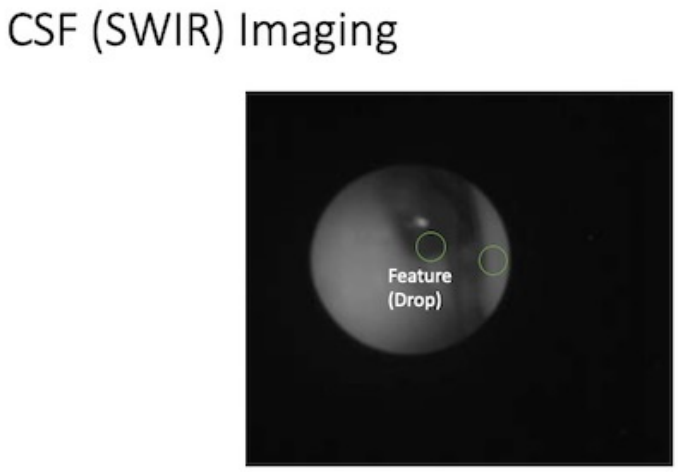
Docket #: S19-019

Optical Method for Intraoperative Detection of CSF leaks in the Short Wave infrared

Stanford researchers have developed new optical device capable of identifying CSF leaks in a safer, label free manner. This multi-wavelength (785nm, 1200nm and 1450nm) surgical system uses an endoscope sensible to the short-wave infrared region (SWIR) to explore different areas of the skull base for CSF leaks. Absorption spectra were obtained for CSF, blood, and mucus. 3D printed models and cadaver testing were used as a proof-of-principle to assess the effectiveness of this surgical device in detecting CSF leaks intraoperatively. This method is believed to be an effective means of diagnosis without the need for intrathecal fluorescein.

Figure





Stage of Development

- **Prototype** has been built and tested on 3D models and cadavers

Applications

- **Identifying CSF leaks**, a common complication arising from endoscopic endonasal skull base surgery
- **Verifying viability of nasal pedicle flaps**
- **Can image other region** in addition to skull e.g., for verifying viability of nasal pedicle flaps, or for identifying ureters during laparoscopic robotic surgeries, or leaks in gastrointestinal surgery

Advantages

- **Safer** – allows detection of CSF without need for fluorescein which can cause serious complications
- **Wider access** - Allows access to different areas of the skull base
- **Broad applications** - can also be used for detection IR dyes in the vasculature or tumors

Patents

- Published Application: WO2020247896
- Published Application: 20220087592

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