A Pressure sensing balloon catheter assisted sleeve gastrectomy

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INTRODUCTION

- The success of sleeve gastrectomy depends on how well a small stomach of appropriate size and shape is created.
- Various types of guiding tubes are available to assist in creating an ideal shape of the stomach during sleeve gastrectomy.
- We are currently developing a guiding tube with pressure sensors attached, which will help even inexperienced surgeons to create a well-shaped stomach of appropriate size during successful sleeve gastrectomy.

METHODS

- The device consists of bougies with attached pneumatic sensors to monitor stomach pressure, enabling surgeons of all levels to perform gastrectomy with ease.
- Real-time sensor detects and alerts surgeon of insufficient or excessive gastric pressure during surgery.
- An experiment of sleeve gastrectomy was conducted on a live pig.

FIGURES

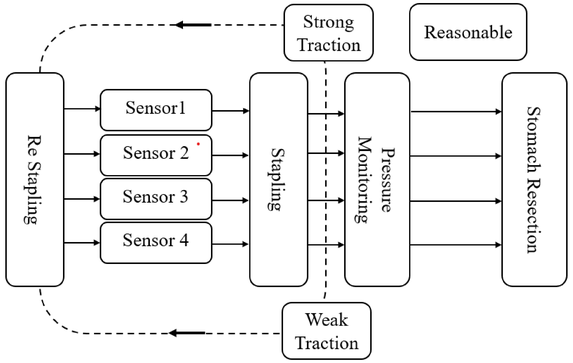


Fig 1. Experiment Process

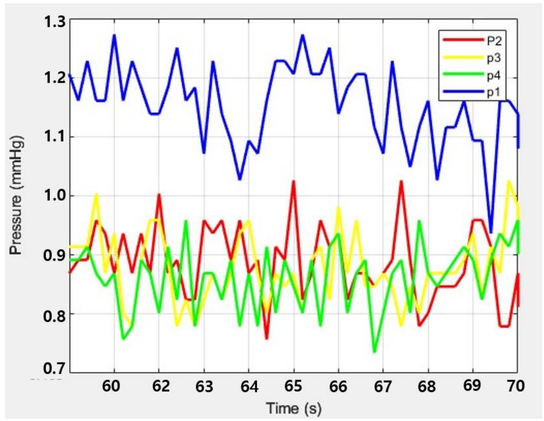


Fig 2. Example of Pressure monitoring

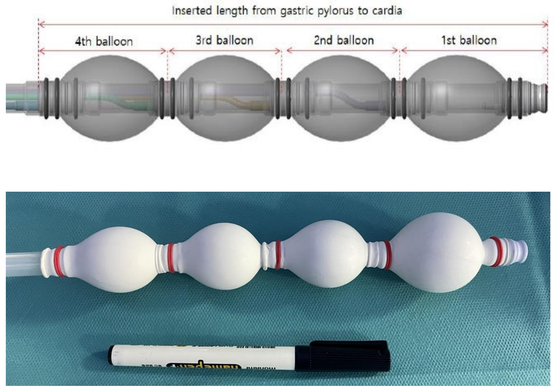


Fig 3. Latex Bougie Design & Fabrication

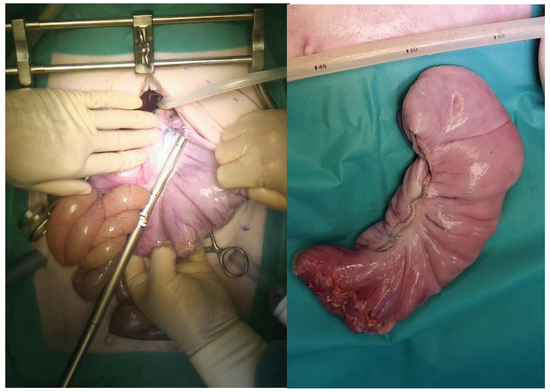


Fig 4. Live Pig Experiment

RESULTS

- The experiment was safely conducted without any problems using the pressure guiding tube.
- Pressure was maintained at 1.1-1.3 mmHg after clamping, and an average pressure of 1.2 mmHg was deemed appropriate.
- Post-surgery sleeve shape and volume were evaluated.

CONCLUSION

- A Bougie catheter connected to multiple sensors was developed in this study to aid sleeve gastrectomy, which was then tested on live pigs through open surgery to confirm its applicability.
- The experiment showed that maintaining a pressure of 1.2 mmHg was the most appropriate volume.
- However, further experiments are necessary to collect and quantify pressure data during laparoscopic surgery.
- With the use of this device, even novice surgeons may perform the surgery more efficiently and prevent complications.