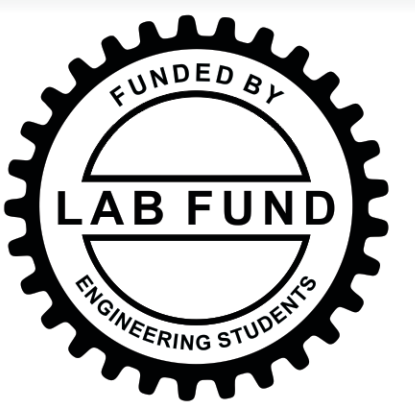


Percutaneous Gastrostomy Tube

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Background

- A gastrostomy is a procedure to insert an enteral feeding tube, for patients who cannot swallow food.
- Existing gastrostomy procedures (SUR, PEG) require specialists and/or surgery.
- Percutaneous Radiologic Gastrostomy (PRG) tube operations have shown to require less resources, and have a faster, safer, and easier insertion procedure.
- Current PRG tubes have shown to have post-op complications such as tube dislodgement and leakage into the abdominal cavity.
- Although current PRG tubes are easier and safer to insert, post operation complications have made them a secondary alternative.

Objective

- Improve the PRG tube to be reliable, while still being as simple to insert as current tubes.
- Tube to be inserted without a gastropexy (temporary fasteners holding stomach to anterior abdominal wall).
- Must not allow any gastric leakage into the abdominal cavity.
- Must hold the stomach against the inside of the abdominal wall with the use of the internal and external bumpers to prevent gastric leakage, this is a static force of 16lbs.
- Must overcome minimum tensile load of 110 N – 225 N to remove.

Recommendations

- Final manufactured product to be injection molded with medical grade polyurethane.
- Research composite materials for structural supports.
- Radio opaque finish necessary for guidance with medical imaging.
- Further testing of the insertion process.
- [REDACTED]
- Add grips on catheter body for better grip during procedure.

Design Solution



Testing and Analysis

- Several iterations of prototypes were fabricated and evaluated based on manufacturability (quality) and function.
- A 3D printed prototype was tested by Inventorr M.D. using the abdominal wall of a rat. The test experimentally determine the tensile load required to remove the internal bumper - 209.00 N \pm 9 N.
- ANSYS was used to estimate force requirements to remove the tube which was found to be 174.93 N
- Testing was performed on already deceased rat, S.M.H. was responsible for the test and appropriate R.E.B.



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