Microline Surgical Articulating Laparoscopic Surgery Device

Project Recap

- Due to IP restrictions, detailed information on the project cannot be given.

Overview

During the semester, Team Microline developed an articulating laparoscopic surgery device to be manufactured by Microline Surgery. The device is capable of articulating, applying clips while articulated or prostrate, applying three clips, and is also disposable. Laparoscopic surgery is a minimally invasive surgery, which is performed by making several small incisions in a patient. Several tools are then inserted into the patient along with a video camera that allows the surgeon to see what he is doing. The new device developed by Team Microline will allow for a greater maneuverability within the patient, which will make surgeries quicker and safer.

Objectives

The problem statement as originally given by Microline Surgical stated that the device should be able to articulate 90 degrees for each magazine, apply a clip while articulated or prostrate, apply 3 clips without having to remove tool from patient, and for the tool to be disposable. Scaling of the tool up six times was permitted but was to be designed for manufacture at 5mm diameter. It was also a requirement that the group use Microline’s current clip and jaw designs.

Approach

- Determine customer needs and metrics via Microline site visit.
- Perform external patent search to determine if there is prior art for design.
- Develop design concepts and rank them using matrices.
- Select design concept and create necessary CAD files.
- Use shapeways.com to rapid prototype parts.
- Develop initial prototype and perform testing.
- Modify final prototype based on prior testing and experimentation.

Outcomes

The project was completed within the budget of $1250. The majority of the budget was invested in a site visit to Microline Surgical in Beverly, Massachusetts, which provided valuable information on the project. The team was able to successfully achieve all of the design goals laid out by Microline Surgical. The concept developed was new and innovative while providing numerous improvements over previous prototypes. Wall thicknesses were increased so as to be able to increase manufacturability. The final prototype is capable of articulating, advancing a clip while prostrate or articulated, apply three clips, and is designed to be disposable. Overall the project was a success and Microline was pleased with the outcome.