In situ laparoscope lens shielding device to ensure constant clear vision

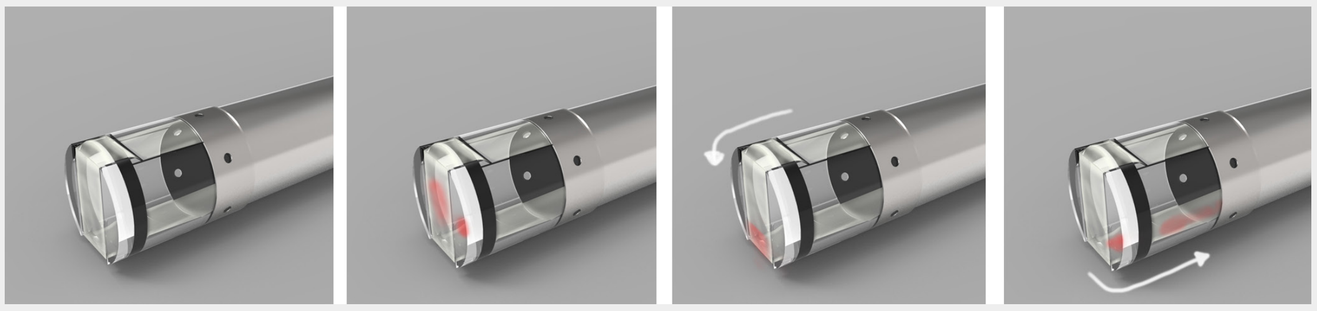
DESIGN CHALLENGE

Laparoscopy is a kind of minimally invasive surgery which involves surgical procedures in the abdominal cavity through a rigid endoscope called the laparoscope. During the surgery, the laparoscope lens gets contaminated frequently due to body fluids, bone dust, surgical plumes and fogging. This impairs the surgeon's vision. In order to maintain a clear view of the operating field, the scope has to be removed out of the patient's body to clean it manually several times per procedure. This disrupts their work-flow, consumes time and creates frustration for the surgical team. The overall context in which the laparoscope is used is quite complex. Multiple users interact with it in a different way at different stages of its use.

The focus of this thesis is creating a solution to keep the lens tip of the laparoscope clean during the surgery to ensure clear and constant vision while also adapting the solution to the complex context.

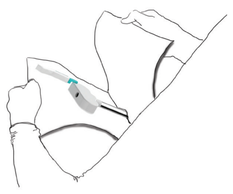
PROPOSED SOLUTION

The proposed solution a an in situ laparascope lens tip cleaner with a continuous transparent tape over the tip of the laparoscope. This surface can be changed on demand in an event of contamination with a press of an easy to use trigger situated within the reach of the surgeon. When the trigger is pressed, the transparent tape moves taking along all the contaminants stuck to the tip surface, thereby cleaning the surface and providing clear vision to continue with the operation.

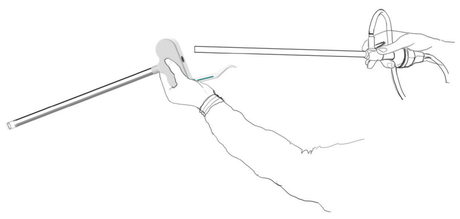


INTENDED USE

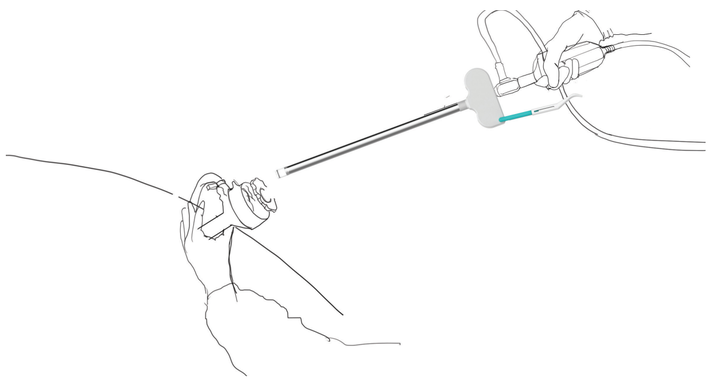
1. Open the protective cover and remove the device



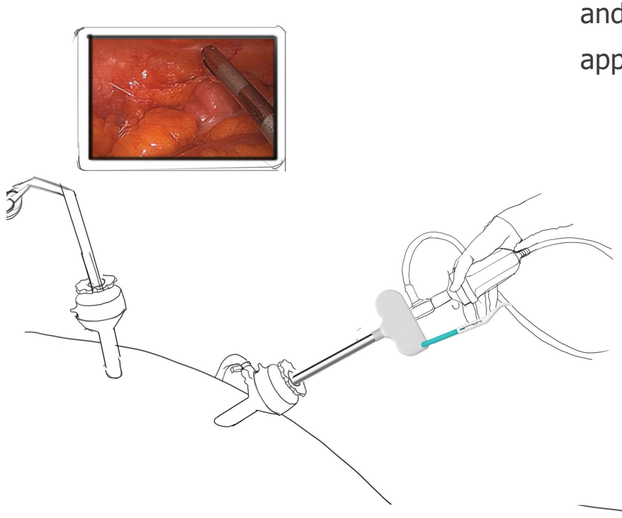
2. Put the device over the laparoscope



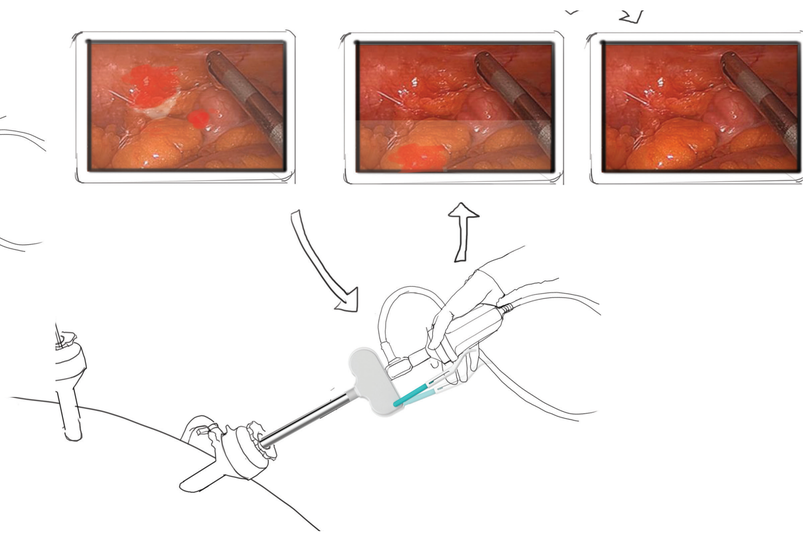
3. Insert the device and laparoscope in the trocar



4. The operative field is visible and operation is in progress.



5. During the surgery, the laparoscope tip gets contaminated with blood splashes.The surgeon reaches out for the trigger and pulls it, the tape at the tip moves and a fresh surface appears at the tip.



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30th August, 2019

Integrated Product Design

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