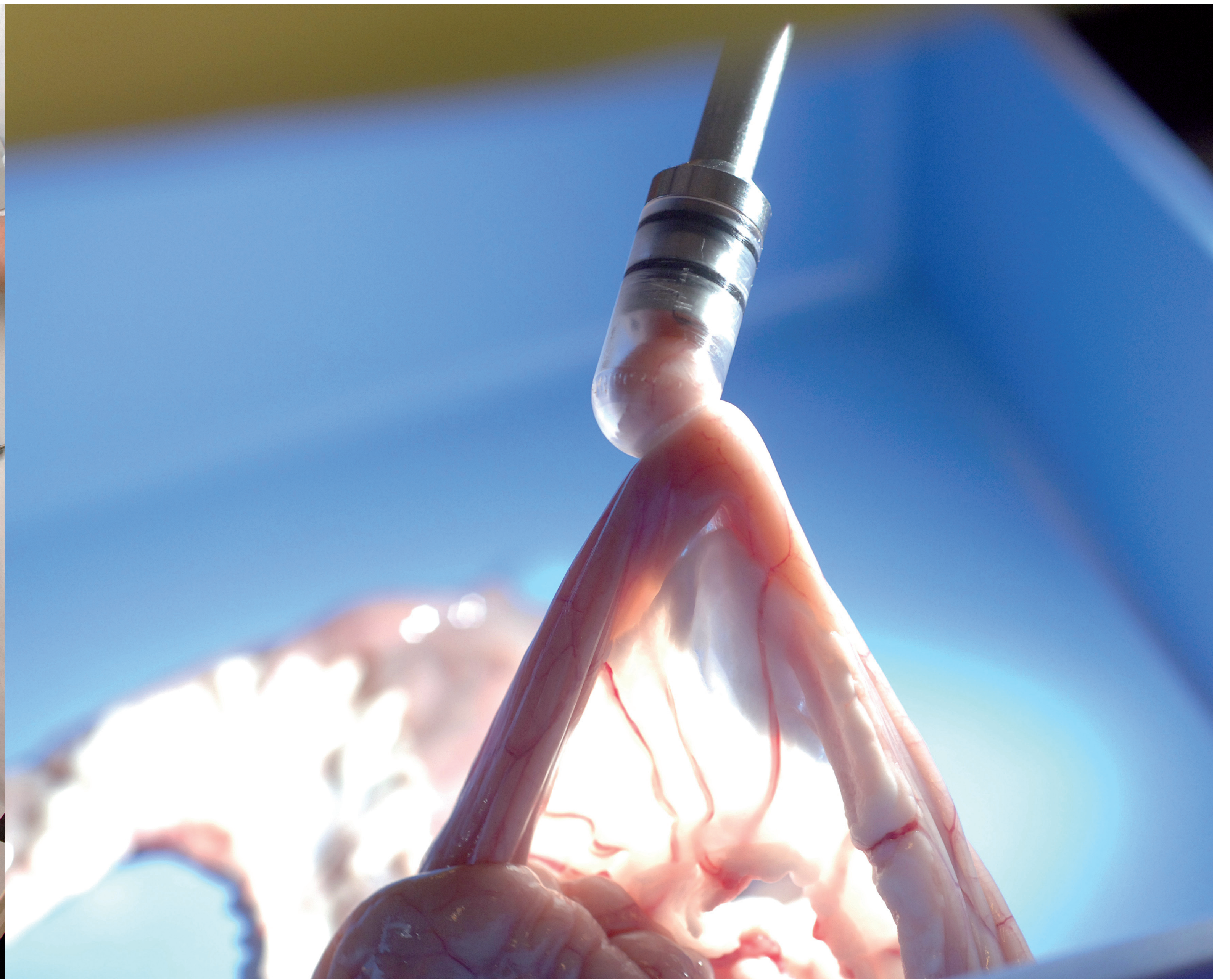
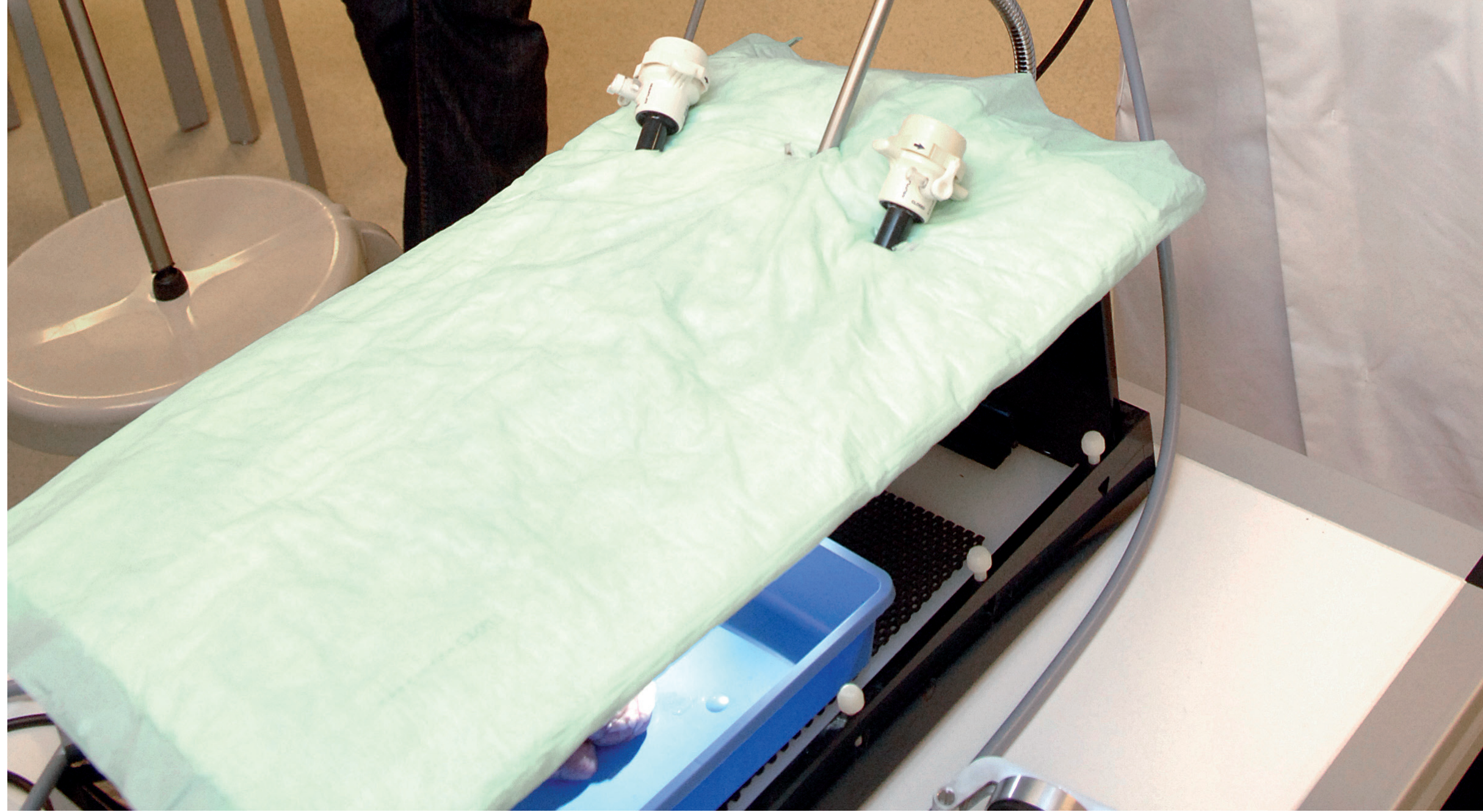




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# Human bowels safely grasped

## The potential of vacuum technique in laparoscopic surgery

### About

In laparoscopic surgery specially designed instruments are required to manipulate the soft organs in a safe way. This is particularly true for the bowels since bowel damage can have severe consequences for the patient, potentially even death. In other application domains vacuum technique is often used for delicate and precise manipulations because of the high level of control. This project investigates the potential of vacuum technique as a manipulation and stabilization technique for laparoscopic surgery.

### Questions

The question whether vacuum technique can be used in laparoscopic surgery can be divided into the following subquestions:

- Can vacuum technique be used to perform simple surgical tasks?
- What are the physical conditions in order to provide a firm grip on the bowel by means of vacuum technique?
- What are the microscopic effects of vacuum grasping on the bowel when the bowel is grasped for shorter periods of time (Manipulation) and longer periods of time (Stabilization)?
- How does vacuum grasping compare to mechanical grasping, both macroscopically and microscopically?
- Are vacuum instruments feasible in terms of usability?

### Results

The project has two main results:

- Vacuum technique is a safe grasping technique to manipulate the bowels. A laparoscopic vacuum grasper was developed and successfully tested by several expert surgeons. This instrument is now due and scheduled for clinical trials. An interesting aspect about the instrument is that it is skill-independent. The instrument can be used without training and still be safe to be used on the bowel.
- A second instrument was developed for positioning and stabilizing the bowel. A first functional model was manufactured and tested successfully. A follow-up prototype is being manufactured for in-vivo tests.

### Partners

- Delft University of Technology
- Karl Storz GmbH
- Catharina hospital Eindhoven

### People

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