Anastomosis Robot Tool (ART)

Trippel, Yuki
Kovacs, Dominik
Steinlechner, Thomas

Anastomosis Robot Tool (ART) is a surgical instrument. It may be used in surgery for bowel resection (i.e. cutting out a segment of large bowel that is affected by cancer) to reconnect the two ends of bowel. In order to achieve a tight anastomosis (i.e. the surgical connection of two parts of bowel) ART joins the two ends together with a circular row of staples. This principle is already known from the conventional instrument “circular stapler”, that however has a clear disadvantage: Due to its shape and its rigidity the circular stapler is not able to anastomose parts of bowel which are farther away from the anus than 20 cm, which causes longer hospital stays and large scars. In order to realise a minimally invasive operation for all parts of the colon (i.e. large bowel) it was necessary to miniaturize the circular stapler and execute all movements and actions in an electromechanical way. Due to the high requirement of torque and the small space in the device, it was necessary to design a special gear motor. ART is controlled by a fail-safe tethered remote. The remote informs the surgeon about the stage of the operation at any given time. The small dimension of our instrument allows the surgeon to move it through the whole large bowel with a coloscope or with laparoscopic forceps.

Awards Won:
Second Award of $2,000