Abstract CARP
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The project title: Compression Anastomotic Ring-locking Procedure (CARP).

Background:
Compression anastomoses might represent an improvement over traditional hand-sewn or stapled techniques in colorectal surgery. We describe a novel concept of suture-less colonic anastomosis named CARP (compression anastomotic ring-locking procedure), which allows quantitative measurements of the compression pressure of the anastomosis and radiological examination of the anastomotic integrity.

Methods:
CARP-1: A “proof of concept” study where a total of 31 pigs underwent a resection of the sigmoid colon with construction of a low colo-colic anastomosis using the CARP device.


Results:
CARP-1: All animals recovered uneventfully. Perioperative compression pressure could be measured by the device and radiological examination effectively visualized the anastomosis without signs of leakage. The device was spontaneously evacuated by the natural route within 6 days. Histology revealed collagen bridging of the CARP
anastomosis already after 48–72 hours. Long-term follow up (51–108 days) revealed no stricture formation in the anastomosis and bursting pressures ranged between 120–235 mBar, with majority of bursts (10/12) outside of the anastomosis.

**CARP-2:** No anastomotic leakage or bowel obstruction were observed. One patient had to be re-operated because of a wound dehiscence. Fourteen out of twenty-five patients received the CARP anastomosis. CARP could not be used in nine patients because of size restrictions. The compression pressure ranged between 85–280 mBar. The CARP instrument was evacuated spontaneously in all patients by the natural route within 14 days. Colonoscopy 8–12 weeks after surgery showed well-healed anastomosis without signs of stenosis in all cases.

**The aim of the study:** Anastomotic leakage is a serious complication after colorectal surgery and leads to postoperative morbidity and mortality. The aim of this project is to evaluate the feasibility of the novel CARP instrument to determine the compression pressure in a colo-colic anastomosis and to monitor the anastomotic integrity after surgery.

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