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Low rectal cancer - Aspects of surgical techniques and treatment results

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ABSTRACT

About one third of all patients diagnosed with rectal cancer have a low tumour (i.e. 0-5 cm from the anal verge). Abdominoperineal excision (APE) is the most common surgical procedure in low rectal cancer, performed in approximately 80% of patients. While oncological outcomes in rectal cancer have improved in recent decades, the outcome after APE has remained poor and local recurrence rates have been reported in up to 23% of cases. This may be explained by technical difficulties encountered during APE, resulting in tumour perforations and positive circumferential resection margins. Moreover, many patients have a complicated postoperative recovery, marked by perineal wound complications. The APE technique has recently changed to a more radical procedure, entailing an extralevator approach (ELAPE), in an attempt to improve oncological outcomes.

The aim of this thesis was to evaluate different surgical techniques in patients with low rectal cancer.

The objective of **Paper I** was to assess treatment and outcome in patients operated for low rectal cancer, focusing on differences related to the type of resection. All patients diagnosed with low rectal cancer from 1995 to 2003 in Stockholm were included in the study (n=613). The surgical procedures performed were APE, anterior resection (AR) and Hartmann's procedure. Clinical data, including data on histopathology and outcome, were analysed in relation to the type of surgery performed. The study showed that intraoperative bowel perforation (IOP) was more common after APE (12%) than AR (4%) and Hartmann's procedure (9%); $p=0.03$. Incomplete tumour clearance was also more common in the APE group (18%) than in the AR (5%) or Hartmann groups (14%); $p<0.01$. Although local control and survival were poorer after APE than after AR, the type of operation per se was not an independent prognostic factor.

In **Paper II** the objectives were to investigate if ELAPE improved oncological outcomes compared with standard APE (SAPE) and to analyse the morbidity associated with ELAPE. In this multicentre study, 176 ELAPE operations, performed by 11 European colorectal surgeons, were compared with 124 SAPE from one centre in the United Kingdom. Clinical and histopathological data were collected along with specimen photographs. Tissue morphometry was also performed on the distal ten slices of the specimen. The results showed that ELAPE removed more tissue from outside the smooth muscle layer per slice (median area 2120 versus 1259 mm²; $p<0.001$), leading to a reduction in the involved circumferential resection margin (CRM) (from 49.6 to 20.3%; $p<0.001$) and the intraoperative bowel perforation (IOP) (from 28.2 to 8.2%; $p<0.001$) compared with SAPE. However, ELAPE was also associated with an increased frequency of perineal wound complications (from 20 to 38%; $p=0.019$) compared with SAPE.

The objective of **Paper III** was to evaluate short-term outcomes with a gluteus maximus myocutaneous flap reconstruction (GMF) of the pelvic floor after ELAPE for low rectal cancer. The study included 65 consecutive patients operated with ELAPE and a one-sided GMF for low or locally recurrent rectal cancer at the Karolinska University Hospital between 2002 and 2008. All perineal complications occurring within 30 days after surgery were registered. In addition, the status of the perineal reconstruction at 6 months and 1 year after surgery was assessed based on medical records. The result showed that 41.5% had one or more perineal wound complications. Most common was a minor wound infection, occurring in 23.1% patients, while 18.4% had either a more severe infection with dehiscence or a pelvic abscess. The reconstruction was completely healed in 91% of the patients at 1 year after surgery.

With SAPE the patient remains in the supine position during the perineal part of the procedure. However, turning the patient into the prone position may improve visualisation which could potentially reduce the risk of involved CRM and IOP and, thereby, improve local control. The objective of **Paper IV** was to evaluate local recurrence rates after APE in relation to the positioning of the patient during the perineal part of the procedure. This cohort study included 466 patients operated with APE for low rectal cancer in Stockholm from 2001 to 2010. The study showed an incomplete resection in 12.4% of the patients after APE in the supine position and in 6.8% after APE in the prone position ($p=0.038$). Corresponding figures for IOP were 12.4% and 4.0% ($p<0.001$). Prone APE was associated with a 39% relative reduction rate in local recurrence events compared with APE in the supine position. However, this difference was not statistically significant, HR 0.61, (95% CI: 0.27-1.37).

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