

Health economic aspects of minimally invasive surgical techniques

Akademisk avhandling

Som för avläggande av medicine doktorexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligens försvaras i lokal Humlen, Servicehuset, Sahlgrenska Universitetssjukhuset/Östra, fredagen den 18:e maj, klockan 9.00

Av

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Fakultetsopponent:

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Linköpings universitet

Avhandlingen baseras på följande delarbeten:

- I. Health economic analysis of costs of laparoscopic and open surgery for rectal cancer within a randomized trial (COLOR II).**
Gehrman J, Björholt I, Angenete E, Andersson J, Bonjer J, Haglind E. *Surg endosc.* 2017;31:1225-34.
- II. Health economic analysis of laparoscopic lavage versus Hartmann's procedure for diverticulitis in the randomized DILALA trial.**
Gehrman J, Angenete E, Björholt I, Bock D, Rosenberg J, Haglind E. *Br J Surg.* 2016;103:1539-47.
- III. Health economic analysis of open and robot-assisted laparoscopic surgery for prostate cancer within the prospective multi-centre LAPPRO trial.**
Forsmark A, Gehrman J, Angenete E, Bjartell A, Björholt I, Carlsson S, Hugosson J, Marlow T, Stinesen-Kollberg K, Stranne J, Wallerstedt A, Wiklund P, Wilderäng U, Haglind E. *Submitted manuscript*
- IV. Laparoscopic surgery was associated with fewer complications and lower costs in routine Swedish care for colorectal cancer.**
Gehrman J, Angenete E, Björholt I, Lesén E, Haglind E. *Manuscript*

**SAHLGRENKA AKADEMIN
INSTITUTIONEN FÖR KLINISKA VETENSKAPER**



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Abstract

The aim of this thesis was to compare minimally invasive- with traditional open surgical techniques for various diseases with regards to cost-effectiveness. Health economic evaluations were performed using data from clinical trials and routine care data from registers. The healthcare perspective was represented in all four studies and the societal perspective (including sick-leave costs) was represented in three out of four studies.

Paper I included a cost-minimization analysis of laparoscopic and open surgery as treatment for rectal cancer within the randomized, controlled COLOR II trial. From the healthcare perspective laparoscopic surgery was costlier while from the societal perspective no significant long-term difference was observed. Paper II included a cost analysis of laparoscopic lavage versus Hartmann's procedure as treatment for complicated diverticulitis with purulent peritonitis within the randomized, controlled DILALA trial. Laparoscopic lavage was considered less costly both at 12 months and throughout patients' expected life, from the healthcare perspective. Paper III was a cost analysis of robot-assisted laparoscopic prostatectomy (RALP) versus open surgery for prostate cancer within the prospective trial LAPPRO. RALP was associated with a higher mean cost than open surgery from both the healthcare and societal perspective at 24 months. Paper IV was a prospective cohort study of cost-effectiveness for laparoscopic versus open surgery as treatment for colorectal cancer, with resource use data and unit costs derived from Swedish national registers. Laparoscopic surgery was associated with better clinical and cost outcomes from both healthcare and societal perspectives at 12 months after primary surgery.

Minimally invasive surgery can be cost saving compared to conventional open surgery. It is advisable to perform economic evaluations in routine care, as cost-effectiveness of surgical techniques most likely will change over time.

Keywords: Minimally invasive surgery, health economic evaluation, register-based, trial-based, colorectal cancer, prostate cancer, diverticulitis