

Complications and side effects of Robot Assisted Radical Prostatectomy with focus on anastomotic stenosis and urinary incontinence

Akademisk avhandling

Som för avläggande av Medicine Doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet, kommer att offentlig försvaras i Förmakets aula, Blå Stråket 5, Sahlgrenska Universitetssjukhuset, den 11 juni 2024, klockan 9.00

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Avhandlingen baseras på följande delarbeten

- I. **Koss Modig K**, Arnsrud Godtman R, Bjartell A, Carlsson S, Haglund E, Hugosson J, Månsson M, Steineck G, Thorsteinsdottir T, Tyritzis S, Wallerstedt Lantz A, Wiklund P, Stranne J. **Vesicourethral Anastomotic Stenosis After Open or Robot-assisted Laparoscopic Retropubic Prostatectomy-Results from the Laparoscopic Prostatectomy Robot Open Trial.** *Eur Urol Focus.* 2021 Mar;7(2):317-324.
- II. **Koss Modig K**, Arnsrud Godtman R, Månsson M, Stranne J. **Patient- and procedure- specific risk-factors for urinary incontinence after Robot Assisted Radical Prostatectomy. A Nationwide, population-based study (in manuscript).**
- III. **Koss Modig K**, Arnsrud Godtman R, Langkilde F, Månsson M, Wallström J, Stranne J. **Incontinence Post Robot-Assisted Radical Prostatectomy: Anatomical and Functional Causes (IPA)- A Prospective, Observational, Clinical Trial** (submitted).
- IV. **Koss Modig K**, Månsson M, Arnsrud Godtman R, Langkilde F, Stranne J. **The correlation between membranous urethral length on MRI and sphincteric urethra length on urethral pressure profile prior to radical prostatectomy (in manuscript).**

SAHLGRENKA AKADEMIN
INSTITUTIONEN FÖR KLINISKA VETENSKAPER



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Abstract

This thesis quantifies the risk of two postoperative complications: symptomatic anastomotic stenosis and post-prostatectomy incontinence (PPI), following radical prostatectomy. We aim to identify and explore the risk factors and predictive markers for these complications using data from multiple studies.

The **first paper** analyses data from over 4,000 patients in the Laparoscopic Prostatectomy Robot Open study to assess the incidence of symptomatic anastomotic stenosis after open and robot-assisted radical prostatectomy and its potential influence on urinary incontinence. The **second paper** utilizes patient data from the National Prostate Cancer Registry, collected between January 2017 and December 2021, to identify patient- and procedure-related risk factors for PPI. A prospective study, detailed in the **third paper**, the IPA-study, involves magnetic resonance imaging (MRI), urodynamic evaluations, and dynamic ultrasound of the pelvic floor to investigate the anatomical and functional causes of PPI. The **fourth paper** focuses on the correlation between membranous urethral length (MUL) as measured by MRI and the sphincteric functional urethral length (sFUL) from urethral pressure profiles.

Anastomotic stenosis rates were low overall but were twice as prevalent following open radical prostatectomy compared to robot-assisted procedures. Increased suture numbers showed a protective trend. Strong association for PPI were found with factors such as older age, larger prostate volume, lesser degree of nerve sparing, and earlier urinary incontinence, as reported on electronic Patient-Reported Outcome Measures. Despite previous suggestions, no correlation was found between MUL and sFUL in our analysis.

The findings highlight significant differences in complication rates between surgical techniques and underscore the importance of various anatomical and functional factors in predicting postoperative outcomes. Our ongoing research, which will expand to a multi-center study in spring 2024, continues to build on these insights, aiming to refine predictive models for postoperative complications in prostate cancer surgery.

Keywords: anastomotic stenosis, urinary incontinence, prostate cancer, radical prostatectomy