Göteborg, 2020

Transurethral resection of the prostate
Studies on efficacy, morbidity and costs

AKADEMISK AVHANDLING

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademin, Göteborgs universitet kommer att offentligen försvaras i Hörsal Arvid Carlsson, Academicum, Medicinareberget 3, den 20:e november 2020, klockan 13.00

av **Erik Sagen**

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Avhandlingen baseras på följande delarbeten

I. Erik Sagen, Hans Hedelin, Olle Nelzén, Ralph Peeker. Defining and discriminating responders from non-responders following transurethral resection of the prostate. Scand J Urol, 2018;52(5-6):437-444.

II. Erik Sagen, Ruji-On Namnuan, Hans Hedelin, Olle Nelzén, Ralph Peeker. The morbidity associated with a TURP procedure in routine clinical practice as graded by the Clavien-Dindo system. Scand J Urol, 2019;53(4):240-245.

III. Erik Sagen, Olle Nelzén, Ralph Peeker. Transurethral resection of the prostate: Fate of the non-responders. Scand J Urol, 2020 Sep 4:1-6. Online ahead of print.

IV. Erik Sagen, Reza Javid, Ali Bencherki, Lina Liivrand, Olle Nelzén, Ralph Peeker, Marianne Månsson. Patient related factors affecting in-hospital costs of TURP. Submitted.

SAHLGRENSKA AKADEMIN
INSTITUTIONEN FÖR KLINISKA VETENSKAPER
AVDELNING UROLOGI

GÖTEBORGS UNIVERSITET

Göteborg, 2020

Transurethral Resection of the Prostate: Studies on Efficacy, Morbidity and Costs

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Abstract

Lower urinary tract symptoms (LUTS), due to benign prostatic enlargement (BPE), are increasingly common, in the ageing male. A significant proportion of men will eventually progress with worsening symptoms or with the development of some form of complication secondary to bladder outlet obstruction, e.g. urinary retention. These men require surgical intervention. Transurethral resection of the prostate (TURP) is considered the reference standard surgical intervention for LUTS related to BPE. Over the past decades, the TURP procedure has evolved due to numerous technical improvements and these developments, together with increasing surgical experience, are believed to have contributed to further improvements concerning post-operative functional outcomes, coupled with a decreased morbidity and mortality. The aims of this thesis were to explore and elucidate the effects of TURP, in a non-academic setting, including functional outcomes, complications and healthcare costs. All consecutive men subjected to a TURP procedure due to BPE at Skaraborgs Hospital during the periods 2010-2012 and 2017-2019 were identified and data retrieved from the hospital records. All men were followed-up for 3 months postoperatively and more if deemed necessary. Responders were defined according to criteria set up by de Wildt. Complications were graded according to the Clavien-Dindo system.

In **Paper I**, men with bothersome LUTS and men in urinary retention reported response rates of 95% and 83% respectively indicating that TURP is a successful procedure in both these patient categories.

In **Paper II**, the incidence of major complications was low, during hospital stay (2.3%) and between hospital discharge and follow-up (3.4%). Late complications, requiring endourological re-intervention occurred in 9.7%.

In **Paper III**, we followed the fate of the 35 non-responders and found that 11 men were finally judged to have satisfactory voiding parameters, 16 men utilized clean intermittent self-catheterisation to varying degrees, 7 men had to use an indwelling catheter indefinitely, and only one man still suffered from bothersome LUTS.

In **Paper IV**, we analysed all in-hospital expenses of 122 men subjected to TURP and found that the median cost for this procedure was 37343 SEK (IQR 29852-44260). The main drivers of total cost were length of hospital stay, the surgical procedure and anaesthesia related costs. The main factor that increased total cost per patient was the occurrence of complications.

In summary, TURP is a successful procedure in men with bothersome LUTS and in men with UR. Considering the difference regarding voiding outcomes in men operated on due to LUTS or UR, these groups should be analysed separately in future studies comparing TURP against newer treatment modalities. Men with preoperative urinary retention constituted the majority of non-responders. The use of postoperative urodynamic studies was remarkably low. Almost one in three non-responders finally had a satisfactory outcome with or without re-intervention. TURP in routine clinical practice was associated with a low incidence of severe complications. TUR syndrome was very rare. Within five years a small proportion of men require the transurethral intervention to be redone. However, the costs of a TURP procedure are strongly influenced by postoperative complications and all necessary means should be taken to avoid them from occurring.

Keywords: Transurethral resection of the prostate, benign prostatic hyperplasia, urinary retention, complications, healthcare costs

ISBN: 978-91-8009-058-2 (Printed edition) http://hdl.handle.net/2077/64543
ISBN: 978-91-8009-059-9 (Electronic edition)