



**Karolinska
Institutet**

Department of Clinical Science and Education, Södersjukhuset

TRANSURETHRAL RESECTION OF THE PROSTATE – HOW TO REDUCE MORBIDITY

AKADEMISK AVHANDLING

som för avläggande av medicine doktorsexamen vid Karolinska Institutet
offentligen försvaras på svenska språket i Södersjukhusets Aula,
Fredagen den 21 oktober 2011 kl. 09.00

av

Tim Fagerström
Leg.läk.

Huvudhandledare:

Professor **Robert G Hahn**
Linköping University
Faculty of Health Sciences
and

Research Unit
Södertälje Hospital

Bihandledare:

Docent **Claes R Nyman**
Karolinska Institutet
Department of Clinical Science and
Education, Södersjukhuset

Fakultetsopponent:

Professor **Ralph Pecker**
Göteborgs Universitet
Sahlgrenska Akademin
Institutionen för Kliniska
Vetenskaper

Betygsnämnd:

Docent **Michael Häggman**
Uppsala Universitet

Institutionen för Kirurgi
Professor **Anne-Charlotte Sedin-
Kinn**

Karolinska Institutet
Institutionen för Molekylär Medicin
och Kirurgi

Professor **Jan Jakobsson**
Karolinska Institutet
Institutionen för Fysiologi och
Farmakologi (FyFa)

Stockholm 2011

ABSTRACT

TRANSURETHRAL RESECTION OF THE PROSTATE – HOW TO REDUCE MORBIDITY

Transurethral resection of the prostate (TURP) is the gold standard method for surgical treatment of benign prostatic hyperplasia (BPH). Despite the more recent introduction of medical therapies for BPH, the high efficacy of TURP still makes it one of the most common surgical operations worldwide and approximately 6,000 such operations are performed every year in Sweden. However, this surgical technique is not without problems with per- and postoperative bleeding events and TUR syndromes being the most serious ones. The overarching goal of this Thesis was to explore if morbidity in TURP could be further reduced, either by pharmacological or surgical interventions.

Study I was a double-blind, randomized, placebo controlled, multicentre study comprising 214 patients. The aim was to determine whether pre-treatment with dutasteride reduces surgical blood loss or postoperative complications in patients who undergo TURP. Placebo was compared with dutasteride 0.5 mg/day 2 weeks before and after TURP, or 4 weeks before and 2 weeks after TURP. Despite significant suppression of intraprostatic DHT, pre-treatment with dutasteride did not result in any significant reduction in blood loss during or after TURP or complications afterward compared to placebo. **Study II & III** comprised 202 patients with BPH scheduled for TURP. After randomization to either bipolar or monopolar surgery, 185 patients were evaluated with respect to blood loss (Study II) and postoperative outcome (Study III). In Study II bipolar surgery resulted in significantly lower blood loss (235 ml vs. 350 ml, $P < 0.001$) and transfusion rates (4% versus 11%, $P < 0.01$). The latter probably explained by the 81 % difference in blood loss for the 75th percentiles (472 ml vs. 855 ml). In Study III, bipolar surgery was followed by a 16–20% higher percentage of the patients reporting ongoing improvement at 3 and 6 weeks after the surgery ($P < 0.05$). There were fewer readmissions in the bipolar group than in the monopolar (5 vs. 13, $P < 0.05$). No differences between the groups with respect to hospital stay and catheter duration was recorded. Both bipolar and monopolar TURP resulted in marked and sustained improvements of IPSS, bother score, and TM. **Study IV** was an experimental exploration of the *in vitro* degree of vaporization in bipolar and monopolar resection, something previously poorly investigated. Samples of chicken muscle and lamb kidney were resected and then desiccated. Results showed that more muscle than kidney tissue was vaporized. The fraction of vaporized tissue was significantly higher in the bipolar technique. In muscle, the differences between monopolar and bipolar were 17% ($P < 0.05$) and 26% ($P < 0.001$) respectively, depending on the type of irrigation used. For kidney, the differences were 27% ($P < 0.01$) and 34% ($P < 0.01$) respectively.

In **conclusion**, no significant reductions in blood loss during and after TURP or complications afterward with dutasteride compared with placebo are observed. Bipolar TURP significantly reduces the total surgical bleeding, with as much as 81% for the largest haemorrhages as well as the need for erythrocyte transfusions. Postoperative readmissions are fewer and postoperative recovery is faster in bipolar TURP. Bipolar TURP, results in equally long lasting good results in TM/IPSS and QoL, as in standard monopolar technique. Vaporization stands for a further 50% tissue removal during conventional resection and is significantly higher in bipolar standard loop resection. Bipolar resection devices work satisfactorily in Ringer's Acetate in an *in vitro* setting.

All previously published papers were reproduced with permission from the publisher.

Published by Karolinska Institutet. Printed by Larserics Digital Print AB

© Tim Fagerström, 2011

ISBN 978-91-7457-408-1