

URETHRAL STRICTURES IN MEN

Studies On Reconstructive Surgery And Pathophysiology

AKADEMISK AVHANDLING

som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien vid Göteborgs universitet kommer att offentligen försvaras i hörsalen Arvid Carlsson, Academicum, Medicinargatan 3, fredagen den 9 december kl. 09.00

av **Teresa Olsen Ekerhult**

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Avhandlingen baseras på följande delarbeten:

- I. Teresa O. Ekerhult, Klas Lindqvist, Ralph Peeker and Lars Grenabo. **Low risk of sexual dysfunction after transection and nontransection urethroplasty for bulbar urethral stricture.** J Urol. 2013; 190: 635-8.
- II. Teresa O Ekerhult, Klas Lindqvist, Ralph Peeker and Lars Grenabo. **Limited experience, high body mass index and previous urethral surgery are risk factors for failure in open urethroplasty due to penile strictures.** Scand J Urol. 2015; 49: 415-8.
- III. Teresa O Ekerhult, Klas Lindqvist, Ralph Peeker and Lars Grenabo. 2016. **Outcomes of re-intervention after failed urethroplasty.** Submitted for publication in Scandinavian Journal of Urology.
- IV. Teresa O Ekerhult, Klas Lindqvist, Lars Grenabo, Christina Kåbjörn and Ralph Peeker. 2016. **Sclerosis and severe fibrosis as a predictive factor for restricture after bulbar urethroplasty.** In manuscript.

SAHLGRENKA AKADEMIN
INSTITUTIONEN FÖR KLINISKA VETENSKAPER



Abstract

Urethral Strictures In Men: Studies On Reconstructive Surgery And Pathophysiology

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Urethral stricture is a common disease that is characterised by fibrotic tissue arising from inflammation after urethral injury. Urination is inhibited when there is total obstruction, and the suffering is immense. Following the paradigm shift in treatments, from internal urethrotomy to open urethroplasty surgery, different surgical techniques have emerged. The aims of this thesis were to assess the outcomes of different reconstructive surgical techniques, including redo surgery, and to analyse the histopathology of urethral stricture disease.

All consecutive patients subjected to urethroplasty at Sahlgrenska University Hospital during the period 1999–2014 were identified and data were retrieved from their medical charts. Papers I-III were retrospective studies and Paper IV was prospective. All the patients were subjected to a follow-up regimen of 3, 12, and 24 months, and more if deemed necessary. If the patient was satisfied with his micturition after 2 years of follow-up, he was discharged from follow-up and instructed to come back if micturition problems should re-appear. Failure or re-stricture were in all the studies defined as the need for a new surgical intervention, such as dilatation, internal urethrotomy, or a redo urethroplasty.

For bulbar strictures, treated with either transection with excision followed by anastomosis (EA) or using a graft as an onlay, **Paper I** reported success rates of 91% and 71%, respectively, with a low risk of sexual dysfunction. This indicates that EA is a feasible method for treating bulbar strictures. In **Paper II**, penile strictures were studied; they were treated with one- and two-stage substitution urethroplasty, (SU) with success rates of 65% and 72%, respectively. Limited clinical experience, obesity and previous urethral surgery emerged as predictors for less favourable outcome. In **Paper III**, 195 re-interventions performed for 82 failures out of 407 consecutive primary urethroplasties, were analysed. EA and SU were equally successful interventions for bulbar re-strictures. Twenty percent of the patients were cured with one single direct vision internal urethrotomy. After one or up to seven re-interventions in each patient, 18 patients remained as failures at the study end-point date, yielding an overall success rate of 78%. The most complex cases involved redo surgery for penile re-strictures, these complicated strictures probably need to be centralised at a specialised clinic, to ensure an optimal outcome. **Paper IV** the histological findings of the resected part of the urethral stricture were analysed. The fibrosis was classified into Grades I–III, where III involved sclerosis. The occurrence of severe fibrosis with sclerosis was a strong predictor of failure after EA surgery for bulbar strictures.

In summary, transection and non-transection surgical procedures entail low rates of sexual dysfunction. Overall, bulbar strictures have a higher success rate than penile strictures, the latter being the most complex ones. Two-stage procedures, involving grafting of buccal mucosa, appear to be the most successful treatment for penile strictures. There are several risk factors associated with urethroplasty surgery. Redo surgery was a relatively rewarding treatment in this cohort, even though several re-interventions were needed to achieve a satisfactory outcome. Sclerosis is a risk factor for failure of urethroplasty in bulbar strictures. The establishment of a classification system for fibrosis pave the way for extended investigations into the origin how strictures develop on the cellular level, as well as novel therapeutic regimens.

Keywords: urethral stricture; transection; urethroplasty; sexual dysfunction; sclerosis; fibrosis; obesity; redo surgery