Effects of vaginal prolapse surgery and ageing on vaginal vascularization
Weber, M.A.

Citation for published version (APA):
Weber, M. A. (2016). Effects of vaginal prolapse surgery and ageing on vaginal vascularization

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: http://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.

UvA-DARE is a service provided by the library of the University of Amsterdam (http://dare.uva.nl)
The first objective of this thesis was to assess the effects of vaginal prolapse surgery on vaginal vasocongestion and vaginal wall sensibility in patients with prolapse organ pathology (POP). We hypothesized that implantation of synthetic mesh could cause a detrimental effect on sensitivity (VAS) and consequent sexual problems. We showed that vaginal vasocongestion levels were diminished after surgical correction of POP. Vaginal wall sensibility of the distal posterior wall was significantly increased after vaginal surgery with the use of synthetic mesh. This could indicate that previous native tissue repair had decreased preoperative vaginal vasocongestion and vaginal wall sensibility in patients with recurrent pelvic organ prolapse. We showed that vaginal vasocongestion and vaginal wall sensibility were significantly decreased after vaginal surgery with the use of synthetic mesh, which is not the case with surgical repair using biologic material. The hypothesis that surgery with synthetic mesh could cause a detrimental effect on vaginal vasocongestion and vaginal wall sensibility was not confirmed. The effect of vaginal surgery on the microcirculation of the vagina was evaluated in a study group of healthy young female volunteers, free of comorbidity's that could influence the microcirculation, using sidestream dark-field imaging (SDFI). The microcirculation of the vagina is a recognizable pattern in the population of young and healthy women. The hypothesis was to demonstrate that vaginal microcirculation, as defined by the measurements in women with POP, makes them very suitable for the evaluation of the effect of vaginal surgery on the microcirculation of the vagina. Our second objective was to describe the effect of vaginal surgery on the microcirculation of the vagina. We hypothesized that vaginal microcirculation has a recognizable pattern in this population of young and healthy women. The third objective was to objectively assess the effects of vaginal surgery on subjective and objective measurements of vaginal microcirculation. We hypothesized that vaginal microcirculation is highly sensitive to changes in oestrogen concentrations and vaginal pH, which can cause a change in vaginal microcirculation. Our third objective was to evaluate whether vaginal microcirculation, as representative for the microcirculation of the vagina, shows a recognizable pattern in this population of young and healthy women. The fact that vaginal microcirculation resulted in no additional insight into the physiologic changes POP entails, but the consistency of the measurements in women with POP makes them very suitable for the evaluation of the effect of vaginal surgery on the microcirculation of the vagina. Our fourth objective was to evaluate the effect of vaginal surgery on the microcirculation of the vagina. We hypothesized that vaginal microcirculation showed a recognizable pattern in this population of young and healthy women. The third objective was to evaluate the effect of vaginal surgery on the microcirculation of the vagina. We hypothesized that vaginal microcirculation can be used to quantify vaginal microcirculation, as defined by the measurements in women with POP, which are very suitable for the evaluation of the effect of vaginal surgery on the microcirculation of the vagina.
Effects of vaginal prolapse surgery and ageing on vaginal vascularization

M.A. Weber
Effects of vaginal prolapse surgery and age on vaginal vascularization

Colofon

Cover and design by: Jornt van Dijk en Matthijs Ariëns, Persoonlijkproefschrift.nl
Printed by: Ipskamp Drukkers BV

©Maaike Weber, Amsterdam, the Netherlands 2016

All rights reserved. No part of this thesis may be reproduced, stored or transmitted to any form or by any means, without prior permission of the referenced journal or the author.

Financial support for printing of this thesis was kindly supported by: Academisch Medisch Centrum Amsterdam, Astellas, Bard, BMA BV (Mosos), Boston Scientific, Braedius Medical BV, Chipsoft, Coloplast, Entercare, Erbe, Memidis Pharma BV, Will-Pharma BV.
Effects of vaginal prolapse surgery and ageing on vaginal vascularization

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad van doctor
aan de Universiteit van Amsterdam
op gezag van de Rector Magnificus
prof. dr. D.C. van den Boom
ten overstaan van een door het college voor promoties
ingestelde commissie,
in het openbaar te verdedigen in de Agnietenkapel
op woensdag 22 juni 2016, te 10.00 uur

door

Margaret Anne Weber

geboren te Utrecht
Promotiecommissie

Promotores: Prof. dr. J.P.W.R. Roovers
           Prof. dr. M.J. Heineman
Universiteit van Amsterdam

Co-promotor: Prof. dr. ir. C. Ince
Universiteit van Amsterdam

Overige leden: Prof. dr. G.G. Kenter
               Prof. dr. J.J.M.C.H. de la Rosette
               Dr. E.T.M. Laan
               Prof. dr. ir. T.H. Smit
               Prof. dr. H.A.M. Bröllmann
Universiteit van Amsterdam
Vrije Universiteit Amsterdam

Faculteit der Geneeskunde
Voor mijn ouders
# Contents

**Chapter 1** General introduction 9

**PART 1: EFFECTS OF VAGINAL PROLAPSE AND VAGINAL PROLAPSE SURGERY ON VAGINAL VASCULARIZATION**

**Chapter 2** The effects of vaginal prolapse surgery using synthetic mesh on vaginal wall sensibility, vaginal vasocongestion, and sexual function: a prospective single-center study 23

**Chapter 3** Vaginal microcirculation: non-invasive anatomical examination of the micro-vessel architecture, tortuosity and capillary density 41

**Chapter 4** Is pelvic organ prolapse associated with altered microcirculation of the vaginal wall? 61

**PART 2: EFFECTS OF AGEING AND LOCAL OESTROGENS ON PELVIC FLOOR DISORDERS**

**Chapter 5** Assessment of vaginal atrophy: a review 83

**Chapter 6** Focal depth measurements of the vaginal wall: a new method to non-invasively quantify vaginal wall thickness in the diagnosis and treatment of vaginal atrophy 119

**Chapter 7** Local oestrogen for pelvic floor disorders: a systematic review 135

**Chapter 8** The effect of vaginal oestriol cream on subjective and objective symptoms of stress urinary incontinence and vaginal atrophy: an international multi-center pilot study 207

**Chapter 9** General discussion 227

**Chapter 10** Summary and conclusions 239

**Chapter 11** Samenvatting en conclusies 249

**Appendices**
- List of co-authors and affiliations 261
- List of publications 265
- PhD portfolio 267
- Curriculum Vitae 271
- Dankwoord 273