

The Effects of Vaginal Prolapse Surgery Using Synthetic Mesh on Vaginal Wall Sensibility, Vaginal Vasocongestion, and Sexual Function: A Prospective Single-Center Study

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ABSTRACT

Introduction. Vaginal mesh surgery in patients with pelvic organ prolapse (POP) has been associated with sexual dysfunction. Implantation of synthetic mesh might damage vaginal innervation and vascularization, which could cause sexual dysfunction.

Aim. We aim to evaluate the effects of vaginal mesh surgery on vaginal vasocongestion and vaginal wall sensibility in patients with recurrent POP.

Methods. A prospective study was performed among patients with previous native tissue repair, scheduled for vaginal mesh surgery. Measurements were performed before and 6 months after surgery, during nonerotic and erotic visual stimuli, using a validated vaginal combi-probe.

Main Outcome Measures. The combi-probe involves vaginal photoplethysmography to assess Vaginal Pulse Amplitude (VPA) (representing vaginal vasocongestion) and four pulse-generating electrodes to measure vaginal wall sensibility (representing vaginal innervation). Sexual function was assessed using validated questionnaires (Female Sexual Function Index, Female Sexual Distress Scale-Revised, and Subjective sexual arousal and affect questionnaire).

Results. Sixteen women were included, 14 completed the 6-month follow-up visit. Vaginal vasocongestion under erotic conditions did not significantly alter after mesh implantation. Vaginal wall sensibility of the distal posterior wall was significantly increased after mesh surgery (preoperative threshold 6.3 mA vs. postoperative 3.4 mA, $P = 0.03$). Sexual function as assessed with questionnaires was not significantly affected.

Conclusions. In women with a history of vaginal prolapse surgery, vaginal mesh surgery did not decrease vaginal vasocongestion or vaginal wall sensibility. Vaginal vasocongestion prior to mesh surgery appeared to be lower than that of women never operated on. Apparently, native tissue repair decreased preoperative vaginal vasocongestion levels to such extent that subsequent mesh surgery had no additional detrimental effect. Our findings should be interpreted cautiously. Replication of the findings in future studies is essential. **Weber MA, Lakeman MME, Laan E, and Roovers JPWR. The effects of vaginal prolapse surgery using synthetic mesh on vaginal wall sensibility, vaginal vasocongestion, and sexual function: A prospective single-center study. J Sex Med 2014;11:1848–1855.**

Key Words. Pelvic Organ Prolapse; Physiological; Mesh Surgery; Sexual Function

Introduction

Pelvic organ prolapse (POP) is a common health problem, as is expressed by a life time risk of 11% to undergo surgery [1]. Thirty percent

of these women will need surgery again because of prolapse recurrence [1]. In case of prolapse recurrence, many pelvic reconstructive surgeons decide to perform vaginal mesh surgery based on evidence of lower rates of prolapse recurrence with

equal dyspareunia rates [2,3]. Three studies assessed sexual function in women undergoing primary mesh surgery, using validated questionnaires [4–6]. One observational study showed an improvement in sexual function at 6-month follow-up, which reached significance after 24 months [4]. Sexual function after primary cystocele repair with or without the use of mesh showed de novo dyspareunia in 3% of the mesh group in another study [5], and in a third study an improvement of sexual function was found in the native tissue repair group but not in the women with primary mesh [6]. These findings may suggest that primary mesh surgery causes more damage to vaginal innervation and vasocongestion than native tissue repair, as sexual function depends on intact vaginal innervation and vasocongestion [7–9].

In 2011, the Food and Drug Administration (FDA) warned against potential detrimental effects of vaginal mesh surgery [10]. One of the mentioned negative effects was the decline in sexual function after mesh surgery due to pain caused by exposure and contraction of the mesh.

We previously showed that native tissue repair negatively impacts levels of vaginal vasocongestion during sexual stimulation as well as vaginal wall sensibility in the cranial posterior vaginal wall [11]. Two hypotheses may be forwarded as to why vaginal vasocongestion and sensibility might be even more affected in patients undergoing mesh surgery than in women undergoing native tissue repair. First, vaginal mesh surgery involves the implantation of mesh into the vaginal wall, necessitating greater dissection of the vaginal epithelium. Second, local effects of the mesh may result in irritation of the vaginal wall or shrinkage of tissue surrounding the mesh.

To study the effect of vaginal mesh surgery on vaginal vasocongestion and vaginal wall sensibility, we conducted a prospective study, performing measurements before and after surgery, using a vaginal combi-probe. This combi-probe was developed by our group [11] and enables measurement of vaginal wall sensibility concurrent with Vaginal Pulse Amplitude (VPA), which is a validated measure of vaginal vasocongestion [12]. Ideally, we would have performed this study in women never operated on, to specifically indicate damage done due to mesh implantation only. However, with the current FDA advice to use vaginal mesh only in patients with recurrent prolapse, our study did not include mesh repair for primary surgery.

We hypothesized that vaginal mesh surgery would negatively affect vaginal vasocongestion and vaginal wall sensibility in women undergoing mesh surgery for recurrent prolapse.

Methods

Participants

Patients scheduled for vaginal mesh surgery were asked to participate in this study. Exclusion criteria were a history of sexual abuse or primary vaginismus, use of medication that negatively affects sexual well-being, diabetes mellitus, hypertensive disorders with vascular disease, and presence of a depressive disorder. At the first visit or during a brief telephone interview, patients were screened for the presence of any of these exclusion criteria. Depressive symptoms were assessed using the Dutch adaptation of the Beck Depression Inventory—Short Form. Patients with total scores ≥ 14 (indicating major depression) were excluded [13,14]. Written informed consent was obtained prior to data collection. The study was approved by the Medical Ethics Committee of the Academic Medical Centre. Patients were paid a compensatory fee of €50.

Study Design

We performed a single-center prospective observational study.

Participants underwent measurements before and 6 months after surgery. This postoperative period was chosen based on a study providing evidence that innervation damage can recover up to six months after a pelvic floor trauma [15].

Psychophysiological Assessment

In the two psychophysiological laboratory sessions, vaginal innervation, vaginal vasocongestion, and sexual feelings and affect were measured under neutral and erotic stimulus conditions.

Vaginal Innervation and Vaginal Vasocongestion

Vaginal innervation and vaginal vasocongestion were measured using the vaginal combi-probe (Figure 1). This combi-probe, which is sized and shaped as a menstrual tampon and which can easily be inserted by the patient herself, includes vaginal photoplethysmography to assess VPA (representing vaginal vasocongestion), and four pulse-generating electrodes to measure vaginal wall sensibility (representing vaginal innervation). The photoplethysmography component of the probe

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