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# THE FIRST EXPERIENCE OF USING TISSUE-ENGINEERED CONSTRUCTS FOR SURGICAL CORRECTION OF ANTERIOR VAGINAL WALL PROLAPSE

**Ailar Assambayeva**<sup>✉</sup> , **Anatoliy Ishchenko** ,  
**Irina Khokhlova**

*Department of Obstetrics and Gynecology, V.F. Snegirev Clinic of Obstetrics and Gynecology, I.M. Sechenov First Moscow State Medical University, Moscow, Russia*

✉ [asambaeva\\_a@staff.sechenov.ru](mailto:asambaeva_a@staff.sechenov.ru)

## INTRODUCTION

Pelvic organ prolapse is defined by herniation of the anterior vaginal wall, posterior vaginal wall, uterus or vaginal apex into the vagina or beyond. The most common type of prolapse is a descent of anterior vaginal wall. Although pelvic organ prolapse can affect women of all ages, it more commonly occurs in older women. It is known that 30.8% of women suffer from this disease in Europe, 19.9–49.6% of women in the Middle East. It is anticipated that by 2050 the number of women experiencing pelvic organ prolapse will increase by approximately 50%. (Pelvic organ prolapse. ACOG Practice Bulletin No. 214. American College of Obstetricians and Gynecologists. *Obstet Gynecol* 2019;134:e126–42). Currently, various surgical techniques are used for the treatment uterine prolapse, including the use of synthetic implants, however, recurrence rate in such patients remain high and ranges from 40 to 60%. Thus, we aim to assess the efficacy of new surgical treatment using tissue engineered constructs.

### *Purpose of the Study:*

To estimate the effectiveness and safety of a novel surgical procedure to correct the anterior vaginal wall prolapse using tissue-engineered constructs.

## MATERIAL AND METHODS

After preliminary experimental work on the creation and evaluation of the biocompatibility of tissue-engineered constructs based on non-biodegradable (polypropylene and titanium endoprotheses) mesh implants with an autologous cellular component (rat and human dermal fibroblasts), four patients aged 44, 54, 70 and 75 years were examined. Inclusion criteria: anterior vaginal wall prolapse (stage II–III); consent to

the installation of tissue-engineered construct. A four-stage surgical program providing for the correction of stage II–III anterior vaginal wall prolapse using tissue-engineered constructs of individual size was used.

## RESULTS

In the early postoperative period, one patient was diagnosed with a small hematoma of the anterior vaginal wall. During the first month after surgery, one patient complained of gradual perineal pain, another patient of frequent urination. Subsequently, these symptoms stopped. After 3, 6, 9, 12, 15 months after surgery, during the pelvic examination at rest, the Valsalva maneuver and transperineal ultrasound, no displacement of organs was detected, ultrasound clearly visualized a tissue-engineered construct without displacement and deformation.

## CONCLUSION

We have developed an original technique to correct the prolapse of the anterior vaginal wall using tissue-engineered constructs based on polypropylene and titanium with an autologous cellular component; which helps to optimize the results of surgical treatment, reduce the frequency of disease recurrence and the risk of developing mesh-related complications.

### *Keywords:*

anterior vaginal wall prolapse, surgical correction, tissue-engineered constructs.