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Modern Materials in Surgical Correction of Genital Prolapse

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Abstract

Genital prolapse is a disease manifested by the displacement of the uterus and the vaginal walls to the genital slit and/or by going beyond it. At the basis of this pathology lies the dysfunctionalityof the ligament apparatus of the internal genital organs and the muscles of the pelvic floor. The causes of this pathology include physical, genetic, age, hormonal factors. Pelvic prolapse is a very urgent problem, due to the high incidence in bothpatientof thereproductive age and postmenopausal women, as well as the projected increase in morbidity in countries with excessive fertility and in countries with a high life expectancy. The most preferred method of treatment is surgical correction, based on neo-fasciogenesis with the use of gridimplants. In this study, 37 operations were performed using a titanium implant, wherethe patients were divided into three groups[1-4]. The patients of the first group underwent a modification of the Manchester operation with fixation of the uterus through the membrane of the obturator opening with use titanium implant. Patients of the second group underwent a colposuspension using a titanium implant when was been performing vaginal extirpation of the uterus. In the third group of patientswas performed the correction of cystocele with using trapezoidal titanium implants. The observation time was 8 to 10 months.During this periodneither recurrence of the diseaseno complications was observed. Evaluation of the results was based on complaints, clinical and diagnostic data (ultrasound ofperineum, MRI with functional tests)[5-11]. This study demonstrated the perspectiveof using titanium implants, due to the presence of a number of advantages over polypropylene.

Keywords: Genital prolapse;Cystocele;Gridimplant;Titanium implant;Colposuspension;Vaginal hysterectomy;Total uterine prolapse

Introduction

The genital prolapse is currently a very urgent problem. The problem of changes in the anatomical connections of the pelvic organs of women and their functions, due to the impact on the tissues of the reproductive system of certain factors, such as childbirth, genetics and lifestyle, has not yet been solved. According to various authors the prevalence of this disease is from 28 to 50%[12,13].

It should be noted that aboutthe third of patients is of reproductive age. This means that in countries with high fertility, the morbidity will increase.Due to the increase in lifespan in countries with highly effective medicine, there is an increase in the number of elderly patients with prolapse. Therefore, it can be assumed that the prevalence of genital hernias will increase significantly in the coming decades.One of the main methods of treatment the prolapse of pelvic organ is surgical correction[14-18].In recent years, the operative gynecology has developed a large number of combined techniques aimed at the prevention of the prolapse of female organs and the treatment of prolapse of vaginal wall and the prolapse of the dome of the vagina with the application of synthetic implants.The studies have shown high efficiency of the proposed methods, low number of complications and relapses[19-22].

Despite the fact that according to a Meta-analysis of the Cochrane collaboration, the most effective method of treatment of genital prolapse is promontofixation, the technical complexity of carrying out of promontofixation, as well as the impossibility and the inexpediency of its use at some patients, does not allow to consider the promontofixation is the gold standard in the treatment of prolapse of female pelvic organs[22-27].

Since latelychoosing surgical methods of treatmentwe prefer technologies based on the creation of a new artificial fasciawith the use of frame systems of various extraneous material. At the momentin Russia there are several surgical methodswhich are based on the use of polypropylene implant[28].

This material has a number of advantages over other synthetic analogues and pork dermal flap. However, the use of polypropylene implants in gynecology revealed a number of complications associated with the feature of the material[29].

In particular, infectious complications, erosion and protrusion of the material as a result of rejection of artificial tissue.The frequency of the latter can be up to 6% according to various data.This necessitates the search for new materials for this type of operations with greater inertia to the surrounding tissues.One of these materials is titanium.For more than 10 years, titanium mesh implants have been used in surgery to treat hernias. And also, in orthopedics and dentistry[30]. The data accumulated over the past years allow us to consider titanium silk as an alternative to polypropylene.

Materials and Methods

By now we have performed 37 surgical interventions in three major clinics in Moscow for women with various forms of genital prolapse using titanium silk as an implant.

Amongthese operations12 patients underwent modification of Manchester surgery with fixation of the uterus through the obturator membrane by means of titanium mesh implants. Modification of the Manchester operation was initially developed with the use of Prolene mesh implant and have proved effective compared with standard the Manchester operation. A feature of this modification is the installation of the implant through the obturator membrane with fixation of the implant base to the cervical stump. Being a new ligament, the implant duplicates the stumps of cardinal ligaments, thereby holding the uterus in a certain position[31].

Whileusing a polypropylene flap we achieved a reduction in relapsesin comparison with the traditional technique. We didn't receiving significant complications in the early and late postoperative period. However, several patients noted pain syndrome that occurred in the early postoperative period.

Theresearchoftitanium silk andobservationofpatients for 8-12 months,didn't reveal any recurrence of the disease. Also, there was not a single case of erosion or suppuration of the implants, as well as dysparinia, or pain syndrome. In 8 cases we used titanium implants performing colposuspension during vaginal extirpation in women with complete and incomplete uterine prolapse. This is a unique technique developed and implemented by a team of authors of our Department of our University[32].

In this case titanium tapes are arranged crossways.They are fixed to the sacrospinal ligaments and excreted through the obturator membrane and muscle from the contralateral side. The place of crossing of the tapes falls on the dome of the vaginawhich ultimately is an additional supportpreventing the developmentabaissementof thevagina dome[33].

The monitoring period of this group of patients ranged from 8 to 10 months. At this stagewe didn't have any MESH-associated complication.The last group of patients was represented by 17 women who underwent correction of cystocele using trapezoidal titanium implant, established by the original technique.In this group there were mainly patients with isolated cystocele of II-III degree. To determine the size of the implant, we used the ultrasound of perineal,MRI with functional tests, as well as intraoperative morphometry.

This allowed us to minimize the size of the implant. And given the features of the titanium mesh we can to simulated the shape of the future fascia.In this group of patients there were no complications at the moment. The period of monitoring was 8-10 months.The assessment of the location of titanium mesh in the postoperative period was estimated by ultrasound of the perineum.

Discussion

The obtained clinical data allow us to assert that the titanium implant has a number of advantages in its use in pelvic surgery, compared with polypropylene. Similar conclusions were reached by our colleagues involved in the surgery of abdominal hernias, as well as orthopedists using titanium silk in their practice. All this allowed to highlight and to explain the benefits of this material compared to polypropylene.

The main features of the implantmade of titanium:

a) Biological inertness (only platinum is more inert). No complications of infectious and allergic genesis

b) The feature of the netting titanium implant allows connective tissue to integrate into the net as much as possible.

c) Formation of type 1 collagen. The collagen of the fist type leads to the formation of ripe connective tissue. In the result, a thin and very dense scar is formed.Whileusing polypropylene materialsthe collagen of thethird type is formed, which in its turn form of immature connective tissue. This leads toa rough scar.

d) Absent aseptic (serous) inflammation.

e) The possibility of application of titanium implants in the presence of an inflammatory process in the tissues. With adequate antibiotic therapy, titanium "takes root" well without causing adhesion of microorganisms and without being a nutrient medium for them.

f) The possibility of use in the elderly and cancer patients (a group of patients with weakened immunity). The cascade reaction of theimmune system doesn'thappen whileusing titanium nets. In addition, titanium, unlike polypropylene, is not subjected to destructionduring chemotherapy

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g) No changes during long-term observation (polypropylene partially destroyed after 5-6 years which leads to" wrinkling "of the grid due to the" low "quality connective tissue scar, andwhichcausesa sense of " foreign body"and usually chronic pain syndrome).

Conclusion

Thus, it should be noted that the use of titanium implants in pelvic surgery, is a highly effective method of correction of genital prolapse and itdoes not have a number of side effects that are typical for polypropelene. This allows us to hope that in the future new technologies will improve the results of treatment of pelvic organ prolapse in women.

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