

# An unexpected neoplasm occurring after vaginoplasty using surgisis soft tissue graft in a patient with Mayer-Rokitansky-Küster-Hauser Syndrome: a novel side-reaction case report

H.W. Ma\*, X.R. Qi\*, L.L. Kong, Y. Chen, X. Zhao, L.Z. Xu

*Department of Obstetrics & Gynecology, West China Second University Hospital of Sichuan University, Chengdu (China)*

## Summary

A variety of surgical methods have been practiced to treat the Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome. One of the latest minimally invasive methods is using surgisis soft tissue graft to cover the dissected space. Few reports about the vault neoplasm and no pathological results after this new operation are seen. Accordingly, the authors herein describe a patient with a vault polyp after vaginoplasty using surgisis soft tissue graft, whose pathological result was unexpected smooth muscle tissue. The authors believe it is possible that the cytokines in the graft are associated with the smooth muscle neoplasm or the fibroblasts transform into smooth muscle cells. In this article, we firstly report the pathological result of the vault polyp after vaginoplasty using biomaterials and discuss its cause with details. According to what they observed and the pathological results, they report a novel side-reaction of this biomaterial for vaginoplasty.

**Key words:** MRKH syndrome; Surgisis soft tissue graft; Neoplasm; Side-reaction; Smooth muscle tissue.

## Introduction

Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome is a relatively rare congenital malformation characterized by lack of vagina and uterus resulting from the failure of Müllerian ducts' development in the presence of a normal 46, XX karyotype [1]. Moreover, the fallopian tubes and ovaries are well-developed with normal development of the physiological hormone levels and secondary sexual characteristics. A variety of surgical methods have been practiced to reconstruct a neovagina. One of the latest methods is using surgisis soft tissue graft to cover the dissected space. It is reported that women who undergo vaginoplasty using biomaterials are believed to obtain a neovagina with near normal anatomic and sexual function [2]. Reports on the complication of the biomaterial used for vaginoplasty are extremely rare; furthermore, few reports about the vault neoplasm and no pathological results after this new operation are seen. Accordingly, the authors herein describe a patient with a vault polyp after vaginoplasty using surgisis soft tissue graft, whose pathological result was smooth muscle tissue, and report the novel side-reaction of this biomaterial for vaginoplasty.

## Case Report

The patient was a 21-year-old female admitted for primary amenorrhea. The gynecological examination showed that the vulva was normal but the vagina, uterus, and even vaginal pouch

were absent. Moreover, the development of the physiological hormone levels and secondary sexual characteristics were also normal with karyotype 46, XX. The ultrasound screens showed that the urinary system and two ovaries were normal, while a 0.7-cm weak echo tubercle was behind the bladder. We reconstructed the vagina with surgisis soft tissue graft (7×10 cm) to cover the dissected space.

During the operation, the authors cut open and injected 4% noradrenaline saline solution into the rectovesical space to expand space and stanch bleeding, then a blunt dissection was made in the rectovesical space to create a new nine-cm deep vagina cavity by using fingers. On the other hand, the surgisis soft tissue graft was shaped into a nine-cm deep tubular mould through absorbable 3-0 interrupted suture. After vaginal irrigation and hemostasis, the tubular graft was wrapped around an acrylic mould and inserted into the neovagina. Then the graft was fixed at the top of vagina, vaginal walls, and vestibule mucosa by using absorbable 2-0 suture. In the end, the tubular vaseline gauze was inserted for compression and the urine tube was kept for the first four days. Later, the vaseline gauze was removed, and then patient started vaginal dilation with a silicone dilator (length: ten cm, diameter: 3.5 cm), which was advised to be daily, with 24-hours continuous wear for the first three months of operation to prevent vaginal contraction. The dilator care included soaking in boiling water for 30 minutes daily.

The authors practiced a routine postoperative follow-up and found the dissected surface recovering well (Figure 1). However a single vault polyp like neoplasm (Figure 2), which seemed white and slightly growing without bleeding, was found 85 days after surgery. It was removed by a unipolar electric knife. However, the pathological result showed the structure of the neoplasm was smooth muscle tissue (Figure 3). The patient was in good condition following polyp removal, with normal sexual activity.

\*Contributed equally to this work and should be considered co-first authors.

Revised manuscript accepted for publication September 30, 2015



Figure 1. — Well-recovered dissected surface 45 days after operation.



Figure 2. — The single vault polyp-like neoplasm.

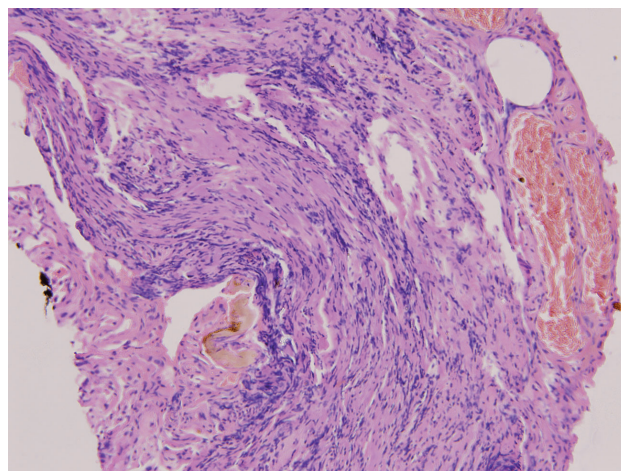


Figure 3. — The pathological result (x200) showing the structure of the neoplasm which is smooth muscle tissue.

### Discussion

MRKH syndrome is a rare congenital malformation, so the related literature is relatively less. However some researchers had observed granulomatous polyps after different surgical methods of vaginoplasty and reported the incidence rate. Selvaggi *et al.* [3] observed a granulomatous polyp in one of the two patients in which the new vagina was reconstructed through a pudendal thigh fasciocutaneous flap, but they did not have a pathological result or explain the cause. In a study containing 182 cases treated with transvestibular vaginoplasty using pelvic peritoneum, Zhou *et al.* [4] reported neovagina vault polyps in 18.7% of patients (34/182). However, they thought that vault granulation was a small problem in some of the cases without presenting pathological results or cause discussion. Zhang *et al.* [5] reported no vault polyps after laparoscopic vaginoplasty using pedicled ileal and sigmoid colon segment transfer. Only one study [2] reported the finding of neovagina vault granulomatous polyps after vaginoplasty using biomaterial graft, which occurred in 11.3% of patients (6/53). It also did not present pathological results but indefinitely attributed polyps to application of the silicone vaginal dilators after surgery. There has been no English literature about vaginoplasty using surgis soft tissue graft, though it has been used in the repair of hernia [6], anal fistula [7], and pelvic organ prolapse [8].

The present authors do not consider neovagina vault polyps after vaginoplasty as a serious problem, but it will make sense to discuss the potential cause and come up with applicable methods to prevent them, which may cost about 30 USD to treat in China and delay patients' desire for sexual activities. As to the pathological results, the authors find it difficult to explain why smooth muscle tissue was found there. As we know, the muscles of pelvic floor belongs to skeletal muscle tissue while the uterus and vagina belong to smooth muscle tissue. However this patient did not have a normal vagina or



uterus. So it is possible, in the authors' opinion, that the polyp originated in another way. Although surgisis soft tissue graft has been used in various operations, any reports about polyps caused by surgisis are not seen at all. The graft contains critical extracellular matrix components, such as hyaluronic acid, collagen, proteoglycans, heparin, and chondroitin sulfate, none of which can promote generating smooth muscle. It also contains various cytokines such as fibroblast growth factors (FGF), transforming growth factors (TGF), epidermal growth factors (EGF), vascular endothelial growth factors (VEGF), and insulin-like growth factor-1 (IGF-1). Both the FGF and VEGF can induce the genesis of vascular smooth muscles and angiogenesis [9]. Wu *et al.* [10] reported that FGF stimulated smooth muscle proliferation and migration towards the region of high density of FGF. Moreover, it was reported that collagen scaffolds mixed with heparin hold FGF within the structure was beneficial for long-term FGF delivery [11]. Therefore, the present authors believe it is possible that the cytokines in the graft are associated with the smooth muscle polyp. In addition, transformation of the fibroblasts near the neovagina vault to the smooth muscle cells may be stimulated by the growth factors and cytokines of surgisis. The fibroblasts contribute to the formation of granulation tissue in the wound healing process. Shi *et al.* reported that fibroblasts could differentiate into smooth muscle cells under optimum conditions [12]. Therefore, it is possible that the fibroblasts differentiate into the smooth muscle cells.

In conclusion, the neovagina vault polyp is rarely described with details after various methods of vaginoplasty, especially those using biomaterial in MRKH syndrome patients. The present authors firstly reported the pathological result of the vault polyp after vaginoplasty using surgisis soft tissue graft and discussed its cause with details. According to what they observed and the pathological results, they report a novel side-reaction of this biomaterial for vaginoplasty and speculate the possible cause. This result reveals that the vault polyp after vaginoplasty is not only a inflammatory tissue as usually thought. The present authors hope that this might provide information to assist doctors to pay attention to this reaction and benefit other patients who will undergo this new minimally invasive vaginoplasty.

## Acknowledgment

This work was supported by the Platform of Science and Technology Project of Sichuan Province (2012JCPT009).

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Corresponding Author:

L.Z. XU, Ph.D.

Department of Obstetrics & Gynecology  
West China Second University Hospital  
of Sichuan University  
No. 20, Section 3, Renmin Nanlu  
Chengdu 610041 (China)  
e-mail: liangzxu@yeah.net