

Case Report

The use of the hysteroscopic and laparoscopic balloon method for a case of a complete uterine septum with a longitudinal vaginal septum

Aiwen Le¹, Li Yang², Zhonghai Wang¹, Xiaoyun Dai¹, Tianhui Xiao¹, Rong Zhuo¹, Rui Yuan²

¹Department of Obstetrics and Gynecology, Shenzhen Nanshan People's Hospital and The 6th Affiliated Hospital of Shenzhen University Health Science Center, China; ²The First Affiliated Hospital of Chongqing Medical University, Chongqing, China

Received March 1, 2018; Accepted October 11, 2018; Epub April 15, 2019; Published April 30, 2019

Abstract: Complete uterine septum is a very rare complete septal uterine malformation. Hysteroscopy and laparoscopy combined with balloon treatment for a complete uterine septum with a longitudinal vaginal septum. The uterine perforation in this case was due to excessive injection of water into the balloon. The repair was performed under the laparoscope. After the resection, the left fallopian tube ostium was visible, and the right fallopian tube ostium was deep and seemed visible. We recommend that a balloon gradually injected with methylene blue be used as a reference point prior to uterine septum resection.

Keywords: Uterine septum, balloon, hysteroscopy, vaginal septum

A uterine septum is a common uterine malformation that may be completed (the longitudinal septum terminates below the internal cervical opening) or incomplete. A complete uterine septum combined with a longitudinal vaginal septum is comparatively rare, and the degree of surgical difficulty is greater [1]. Here, we report one case of treatment using the hysteroscopic and laparoscopic balloon method for a complete uterine septum with a longitudinal vaginal septum. The treatment involved an intraoperative uterine perforation and a subsequent laparoscopic repair to complete the surgery. The specifics are described below. The study was approved by The First Affiliated Hospital of Chongqing Medical University Ethics Committee.

The patient, female and 31 years of age, was found to have a uterine septum for more than seven years and was hospitalized on July 9, 2017. Her menstruation was regular with a menstrual period of 7 days and a cycle of 28 days. A B-mode gynecological ultrasound from more than seven years prior indicated an uterine septum. A hysteroscopic examination in

January 2016 revealed a complete longitudinal septum of the vagina and a complete septum of the uterus. Pelvic cavity magnetic resonance imaging (MRI) was performed; it indicated that the crest of the longitudinal septum inside the uterine cavity reached the internal cervical ostium, consistent with a complete uterine septum. The patient's gravidity-4/Parity-0 (G₄P₀) history included an abortion more than 11 years prior, two spontaneous abortions, and one ectopic pregnancy treated with methotrexate (MTX). A gynecological examination revealed a longitudinal vaginal septum dividing the vagina into two parts. The left external vaginal opening was small, and visualization of its cervix was difficult.

On July 12, 2017, hysteroscopic and laparoscopic uterine septum resection, longitudinal vaginal septum resection, left mesosalpinx cyst resection, and lysis of pelvic adhesions were performed under general anesthesia. During the laparoscopy, a small amount of free bloody fluid was observed in the pelvic cavity. The anterior uterus was normal in size, and the left mesosalpinx was enclosed in a 3 cm cystic

Balloon for uterine septum with vaginal septum



Figure 1. The uterus perforation is seen in the right uterine fundus, (red round).



Figure 2. An incision was made on part of the longitudinal septum using a needle electrode, the white arrow is the balloon catheter and the black arrow is the septum.

mass and adhered to the pelvic cavity. The pelvic cavity adhesion was separated, and the left mesosalpinx cyst was resected.

The longitudinal vaginal septum was completely resected from the external vaginal opening to below the cervix, exposing the external ostium of both cervixes. No. 6-10 uterine dilators were used to expand the left cervix and the uterine cavity, though there were difficulties during entry. Electrocision was performed on the bulging longitudinal septum on the right wall for 2 cm, but entry into the right uterine cavity did not occur. A catheter was placed in the right uterine cavity, and 5 mL of physiological saline was injected into the balloon. The left and right sides of the uterine cavity were not connected. Once again, 10 mL of physiological saline was injected. The right uterine cavity balloon was

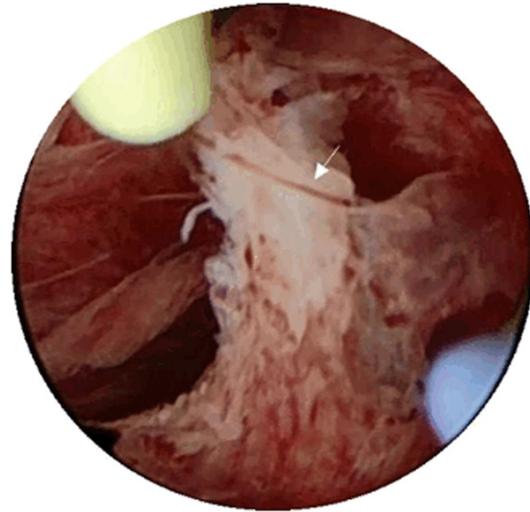


Figure 3. The residual septum (white arrow) is seen clearly after the sacculle is cut.

visualized under the laparoscope, and uterine perforation was considered (**Figure 1**). The fluid in the balloon was extracted, and a uterine repair was performed under the laparoscope. Once again, the right uterine cavity balloon was injected with 5 mL of methylene blue. The left uterine cavity was observed to deviate to a projection on the left, and it was considered to be the longitudinal septum. An incision was made on part of the longitudinal septum using a needle electrode, and methylene blue was seen flowing out from the left uterine cavity (**Figure 2**). Using the right uterine cavity catheter as an indicator, the uterine septum was found to extend from the external cervical ostium to the fundus of the uterus (**Figure 3**). The uterine septum was incised with the bilateral fallopian tube ostium as the upper margin and the internal cervical ostium as the lower margin, and the cervical septum was preserved. After the resection, the left fallopian tube ostium was visible, and the right fallopian tube ostium was deep and seemed visible. The balloon placed in the uterine cavity was injected with 5 mL of water for compression. The vagina was packed with a large sheet of gauze for compression hemostasis.

The patient received postoperative anti-inflammatory treatment. The vaginal gauze was removed one day after surgery. The uterine cavity drainage tube was removed three days after surgery, and the patient was discharged. At the two-month postoperative hysteroscopic re-

Balloon for uterine septum with vaginal septum

examination, the morphologies of the vagina and the uterine cavity were normal.

Discussion

Uterine septa account for approximately 80%-90% of uterine malformations, and 5% of uterine septa are combined with longitudinal vaginal septa [1]. One study showed that [2] uterine septa may not be the real cause of infertility; there was no statistically significant difference in the incidence of infertility between uterine septum patients and the total population. The live birth rate for first pregnancies among preoperative uterine septum patients is approximately 61.5% [3]. In the myometrium of the uterine septum, the smooth muscle cells are dense and disorganized, disproportionate to the connective tissues, and accompanied by an abnormal reduction in the distribution of arterioles, causing incomplete decidualization of the uterine bed. This affects the normal formation of the placenta and can trigger uncoordinated uterine contractions that lead to premature delivery, miscarriage, and other adverse pregnancy outcomes. Esmaeilzadeh [4] et al. observed a pregnancy rate of 67% and a live birth rate of 57.5% among infertile uterine septum patients after septum resection procedures, and the pregnancy rate was 92.1% when the male partner was normal. Surgical treatment should be selected for patients with uterine malformations who have experienced recurrent miscarriage, premature delivery, infertility, or difficulty with sexual intercourse. The patient in this case had two spontaneous abortions that might have been related to the uterine malformation; therefore, surgical treatment was chosen.

Compared with traditional laparotomy procedures, hysteroscopic and laparoscopic surgery is simple, easy, minimally invasive, and safe, but improper operations can easily cause a uterine perforation, bleeding, and a variety of other complications. Whether or not a longitudinal septum of the cervical segment increases cervical relaxation and increases the chance of miscarriage is still controversial [5-7]. In this case, preservation of the cervical septum increased the difficulty of the surgery. At the same time, the patient's complete uterine septum in which one side of the uterine cavity appeared as a blind cavity and overly thick sep-

um myometrium made intraoperative identification difficult and made it easy to enter the myometrium, inducing a false passage. Therefore, the balloon method was used to help identify the longitudinal septum, which aided the resection. With the laparoscope, one can not only see and understand the external morphology of the uterus but also know the condition of the ovaries and pelvic cavity while monitoring the surgical space to find and promptly treat perforations, preventing a laparotomy or a second surgery. The uterine perforation in this case was deemed to be caused by excessive injection of water into the balloon; it should instead be gradually increased. In addition, it is recommended that a balloon injected with methylene blue be used as a reference point prior to uterine septum resection.

In summary, hysteroscopy and laparoscopy combined with balloon treatment for a complete uterine septum with a longitudinal vaginal septum is simple and safe. Methylene blue must be gradually injected into the balloon for the prompt repair of uterine perforations.

Acknowledgements

This work was supported by the Ultrasound departments. We appreciate the valuable comments from other members of our hospital.

Disclosure of conflict of interest

None.

Address correspondence to: Rui Yuan, Department of Obstetrics and Gynaecology, The First Affiliated Hospital of Chongqing Medical University, Youyi Road 1, Yizhong District, Chongqing 400011, China. Tel: +86-18038090785; E-mail: leaiwen@126.com

References

- [1] Byrne J, Nussbaum-Blask A, Taylor WS, Rubin A, Hill M, O'Donnell R, Shulman S. Prevalence of Müllerian duct anomalies detected at ultrasound. *Am J Med Genet* 2000; 94: 9-12.
- [2] Heinonen PK. Complete septate uterus with longitudinal vaginal septum. *Fertil Steril* 2006; 85: 700-705.
- [3] Sugiura-Ogasawara M, Lin BL, Aoki K, Maruyama T, Nakatsuka M, Ozawa N, Sugi T, Takeshita T, Nishida M. Does surgery improve live birth rates in patients with recurrent miscarriage caused by uterine anomalies? *J Obstet Gynaecol* 2015; 35: 155-158.

Balloon for uterine septum with vaginal septum

- [4] Esmailzadeh S, Delavar MA, Andarieh MG. Reproductive outcome following hysteroscopic treatment of uterine septum. *Mater Sociomed* 2014; 26: 366-371.
- [5] Patton PE, Novy MJ, Lee DM, Hickok LR. The diagnosis and reproductive outcome after surgical treatment of the complete septate uterus, duplicated cervix and vaginal septum. *Am J Obstet Gynecol* 2004; 190: 1669-1678.
- [6] Nisolle M, Donnez J. Endoscopic treatment of uterine malformations. *Gynaecol Endosc* 1996; 5: 155-160.
- [7] Vercellini P, Ragni G, Trespidi L, Oldani S, Panazza S, Crosignani PG. A modified technique for correction of complete septate uterus. *Acta Obstet Gynecol Scand* 1996; 73: 425-428.