Case Report

The Use of Interdigitating Y-Flap Technique for Imperforate Hymen

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Article history:
Received 10 September 2021
Accepted 16 December 2021
Available online 27 January 2022

Keywords:
imperforate hymen
hematocolpos
interdigitating Y-flap

ABSTRACT

Imperforate hymen is a rare condition affecting 1 of 2,000 women worldwide. Its treatment is surgical hymenectomy to relieve obstruction and reduce the risk of secondary endometriosis. Current surgical techniques for imperforate hymen pose risks of postoperative complications such as stenosis and ascending infection; thus, a new technique is needed. A case of a 12-year-old girl with a progressively bulging mass was presented. Physical examination revealed hematocolpos due to imperforate hymen. Surgery, using interdigitating Y-flap technique, was performed on the patient. The surgical outcome was satisfactory, and no postoperative complication was found during a follow-up visit.

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INTRODUCTION

Imperforate hymen is the most prevalent Mullerian duct anomaly in the world with an incidence of 1/2,000 girls.1,2 It is most frequently diagnosed during early puberty as abdominal cramps or pelvic pain.
mass in the absence of menstruation. Simple incision is often not preferred in these cases as there are risks of postoperative stenosis with strictures and ascending infection. Therefore, initial cruciate or U-shaped incisions are often more preferable. However, the risks of various complications are still present. The previous study has shown the effectiveness of interdigitating Y-flap technique as the definitive treatment of transverse vaginal septa (TVS). It also signifies the lack of complications following surgery. Nevertheless, there has been no report regarding its effectiveness on imperforate hymen. Therefore, this case report aims to present the role of interdigitating Y-flap as an alternative surgery technique for the definitive treatment of hymen imperforate.

**CASE**

A 12-year-old girl came to our urogynecology center with the chief complaint of a progressively bulging mass on her genitals. She also said that she had to strain to urinate. She had noticed that there was a bulging sensation on her vagina for the previous 3 months. She had never menstruated, her breasts had been growing for a year, and her pubic hair had developed in the previous 9 months. Her prior medical condition was unremarkable and there was no history of similar complaints in her family.

The patient’s vital signs were stable at the time of arrival. Physical examination of the patient’s vagina revealed a protruding membrane from inside her vaginal introitus, which was in accordance with imperforate hymen (Figure 1).

Physical examination revealed no other pathology on her bladder and anus. An abdominal ultrasound showed no anatomical abnormality in her internal genitals. However, it was found that the “mass” was an accumulation of blood (hematocolpos) due to the imperforate hymen. Following the examination, a family meeting was initiated by the doctor with the patient and her parents. She and her parents had been counseled about the situation and the need for surgical intervention to evacuate the blood and they agreed to do so.

During surgery, infiltration of adrenalin diluted with normal saline was performed as a method of hydrodissection and to make the tissue thicker and easier to be dissected later. An inverted Y-shaped incision was made on the external lamella of the hymen, creating three external flaps. The external flaps were then raised all the way to the labia minora. A second Y-shaped incision was then made at 180° to the first, creating three internal flaps. The hematocolpos was then drained using suction. A total of 600 mL of blood was evacuated during the drainage. After the hematocolpos was thoroughly drained, the internal flaps were raised. The external flaps were turned in and interdigitated with the internal flaps. The flaps were then inset using absorbable, 4/0 Vicryl sutures (Figure 2).

On the following day, the patient did not have any complaints and the patient was discharged.
Figure 2. Surgical process of the patient (a) creating interdigitating Y incision and holding the tissues in place, (b) suturing the outer part of hymen, and (c) final appearance of the hymen.
On the seventh-day follow-up visit after the surgery, there was no sign of adhesion or other complication found on the patient. One month after the surgery, the patient reported that she had her period for 5 days with 3 pads used per day. There was also no report of any urinating, menstruation, or defecating problems at the 6-month follow-up.

DISCUSSION

Mullerian duct anomaly is a rare condition affecting women worldwide. Among those anomalies, the imperforate hymen is the most prevalent condition. The hymen generally has a ring-like appearance, with a small opening in order to permit the egress of menses. However, a congenital anomaly caused during fetal development may cause the failure of hymen perforation, causing complete obstruction of the vagina. It is most often diagnosed during the peripubertal period, presenting as hematocolpos. Although cases of imperforate hymen, which need to be surgically corrected, usually appear as emergency cases, it is important to differentiate imperforate hymen from other obstructing anatomic etiologies, such as transverse vaginal septum, labial adhesion, or even distal vaginal agenesis. Thorough physical examination, ultrasound imaging, and even magnetic resonance imaging (MRI) may be used in establishing the diagnosis.

The treatment for imperforate hymen is surgical hymenectomy to relieve the obstruction and reduce the risk of secondary endometriosis. The two most common surgical techniques for imperforate hymen are simple incision or U-shaped excision. However, a simple incision is not preferred as there are increased risks of postoperative stenosis with strictures and urethral damage; it also increases the risk of ascending infection. Although having much lower risks, a U-shaped excision also creates a circular scar, increasing the risks of stenosis as the scar contracts.

A previous study conducted by Arkoulis et al. (2017) has shown that interdigitating Y-plasty produces a satisfactory surgical outcome and lower complication rates for TVS. This technique relies on having no tissue to be excised and a zigzag-shaped scar, thus avoiding various complications associated with the postoperative wound healing process. Using the technique, complications such as wound dehiscence, flap necrosis, and adhesion can be avoided. Technically, it may be tricky to perform the technique in such thin tissue. However, we were able to make a separate incision on the external and internal lamellas by an infiltration technique using epinephrine diluted in normal saline. The duration of surgery was 30 min, although the technique may look difficult, it is easier to perform in such distal areas.

In this study, we present a case of imperforate hymen, treated using interdigitating Y-flap. Although there has been no study regarding its effectiveness on imperforate hymen cases, a previous study regarding its effectiveness on TVS showed satisfactory results. We also observed satisfactory surgical outcomes without any postoperative complications using the technique. However, further studies should be performed to evaluate its effectiveness as compared to other available techniques.

CONCLUSION

Imperforate hymen is a rare condition with limited guidance on its surgical techniques. Interdigitating the Y-flap technique is a novel technique in definitive treatments of imperforate hymen. This technique creates a zigzag scar which reduces the risk of various complications during the healing process and also produces satisfactory surgical outcomes.

Declaration of Competing Interest

Authors declare that there is no conflict of interest in this study.

ACKNOWLEDGEMENTS

The authors would like to extend special thanks to our family, Rathi, MD, who refer this patient to our center, Mrs. Ari Sukmawati for her care and support to the patient and document the surgery, and to all medical staffs for guidance and support.
AUTHORS’ CONTRIBUTIONS

Alfa Putri Meutia: Conceptualization, Formal analysis, Investigation, Resources, Writing, Supervision, Funding acquisition; Kevin Yonathan: Methodology, Software, Writing, Validation, Project administration; Fernandi Moegni: Formal analysis, Writing; Gita Nurul Hidayah: Resources, Supervision.

ETHICAL CLEARANCE

Ethical clearance for this study was given by The Ethics Committee of Faculty of Medicine, University of Indonesia, with ethical clearance letter number KET-728/UN2.F1/ETIK/PPM/00/04/2021. This study conformed with Declaration of Helsinki and its subsequent amendments.

INFORMED CONSENT

Written informed consent was obtained from the patient for anonymized patient information to be published in this article.

PREVIOUS PRESENTATION

Authors declare that the study has never been presented on scientific presentation before.

FUNDING SOURCE

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

REGISTRY AND REGISTRATION NUMBER OF THE STUDY

Not applicable.

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