



# Long-Term Results of an Imperforate Hymen Procedure that Leaves the Hymen Intact

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## Abstract

**Purpose of the Study** The aim of this study was to show the clinical results of postoperative evaluation of cases of imperforate hymen that presented at our center during a 21-year period.

**Methods** A Foley's catheter was inserted in 74 patients of imperforate hymen who reported to the Department of Obstetrics and Gynecology, Meram Faculty of Medicine, Necmettin Erbakan University, between January 1, 1996, and December 31, 2016 with history of pelvic pain. In each case, the hymen was opened via a circular incision from the central of the distended. A Foley's catheter was inserted, and estrogen cream was prescribed for application on the hymenal structure for 14 days. The catheter was removed after 14 days.

**Results** The mean age of the patients at the time of this study was  $28.3 \pm 2.6$  years, and the mean age at diagnosis was  $13.2 \pm 2.5$  years. Twenty-nine (96.6%) patients had experienced vaginal bleeding during their first sexual intercourse experience, and one patient (3.4%) had not. Fourteen out of the 30 married women had become pregnant, of whom nine had delivered vaginally and five had delivered via a cesarean section. After undergoing renal ultrasound, none of the patients had any apparent anomalies. Only one patient had a uterine anomaly, which was a bicornuate uterus.

**Conclusion** A circular incision with insertion of Foley's catheter prevents many social problems by preserving the hymen's architecture and allowing vaginal bleeding to occur during the first sexual intercourse experience.

**Keywords** Foley catheter · Imperforate hymen · Virginity sparing procedure

## Purpose of the Study

The hymen consists of connective tissue that is attached to the vaginal wall. An imperforate hymen, one of the most common obstructive lesions of the female genital tract, is a layer of connective tissue that obstructs the vaginal opening at the level of the introitus [1]. The incidence of imperforate hymen is approximately 1 in 2000 girls, and the diagnosis is often made following menarche. Accumulated blood behind an intact hymen may produce hematocolpos and hematometra. Surgery can be performed either at birth, during post-puberty, or during the premenarcheal period. The surgical procedure is performed under anesthesia and can consist of various types of incisions on the imperforate hymenal membrane [2].

Often considered evidence of virginity, an intact hymen is important in some cultures and religions. Because patients and families suffer anxiety regarding the loss of virginity due to the procedure, the surgeon should use a method that ensures a natural circular intact hymenal structure [3].

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The primary aim of this study was to determine the frequency of bleeding during the first sexual intercourse experience of females who were operated on via a procedure designed to leave the hymen intact. The secondary aim of the study was to assess fertility status.

## Materials and Methods

This study included patients who had been operated for imperforate hymen at the Department of Obstetrics and Gynecology, Faculty of Meram Medicine, Necmettin Erbakan University, between January 1, 1996, and December 31, 2016. The study protocol was approved by the ethics committee of the university hospital, and informed consent was obtained from all patients. We primarily reviewed hospital records and patient files. A total of 74 patients had undergone imperforate hymen surgery that aimed to keep the hymen intact between those dates. All patients had been diagnosed with imperforate hymen by visual inspection of a completely closed hymenal structure, swelling of the hymen outside of the vagina, and ultrasonographic examination of hematocolpos (Fig. 1). Although all patients were informed about classical surgical techniques, they usually chose an alternate method in an attempt to protect their hymenal orifice. Patients who had partial vaginal atresia were excluded from the study.

During each procedure, the patient was positioned in the lithotomy, and the hymen was opened via a circular incision from the central of the distended, with approximately 0.5 cm of hymenal tissue removed. After opening the incision from the central on the imperforate hymen membrane, old blood in the vagina was drained via finger pressure from the vagina to the rectum. Next, viscous, brown, old blood in the vagina was drained using irrigation with a saline solution of approximately 250 ml. The opened site was widened to 1 cm to allow for the insertion of a Foley catheter. Ten milliliters of sterile saline was used to insufflate the catheter's balloon. The Foley's catheter, which was fixed on the patient's thigh with tape (Fig. 2), allowed drainage of blood from the vagina. Only one dose of an intravenous

prophylactic antibiotic was given to all patients (Sefazol, cefazolin; Mustafa Nevzat, Istanbul, Turkey). Patients were followed up in the hospital for six hours after the operation and warned regarding the risks of infection before they were discharged. They were encouraged to clean the vulva with an iodine solution. Estrogen cream (Premarin vaginal cream; Wyeth, Istanbul, Turkey) was prescribed for application on the hymenal orifice for 14 days post-surgery to increase vaginal epithelization. Patients were examined for pelvic infection one week after the procedure. The Foley's catheter was taken out 14 days after the procedure. A postoperative annular and intact hymen is demonstrated in Fig. 3. Patients were followed up monthly for the first six months and every year thereafter.

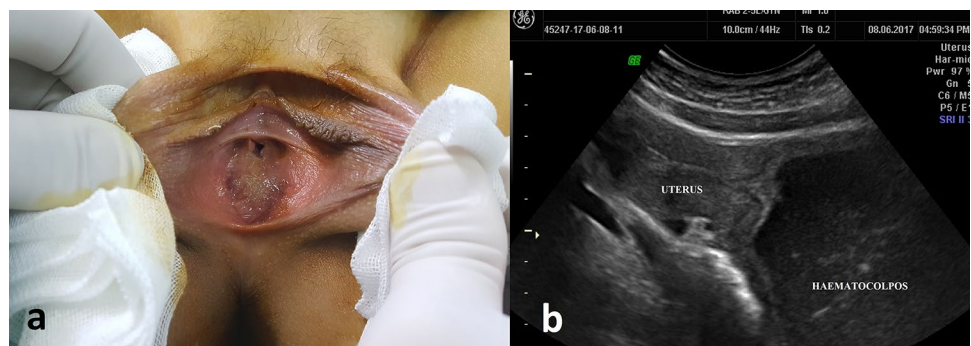
A total of 74 patients were operated during the study period. A flowchart of the study, with both included and excluded patients, is shown in Fig. 4. Eighteen of the 74 patients could not be reached, and eighteen of the 56 remaining patients, who were reached by phone, were excluded because they were not sexually active. Two patients were excluded because they had undergone second operations. Six of the patients reached by phone were excluded because they neither wanted to answer questions nor did they want to come to the hospital. Therefore, 30 patients met the study's inclusion criteria.

In 2017, all patients included in the study were interviewed via telephone by a single medical doctor. All 30 patients were called to the hospital for a standard pelvic examination and renal and pelvic ultrasounds. They were questioned about bleeding during their first sexual intercourse experience as well as their fertility.

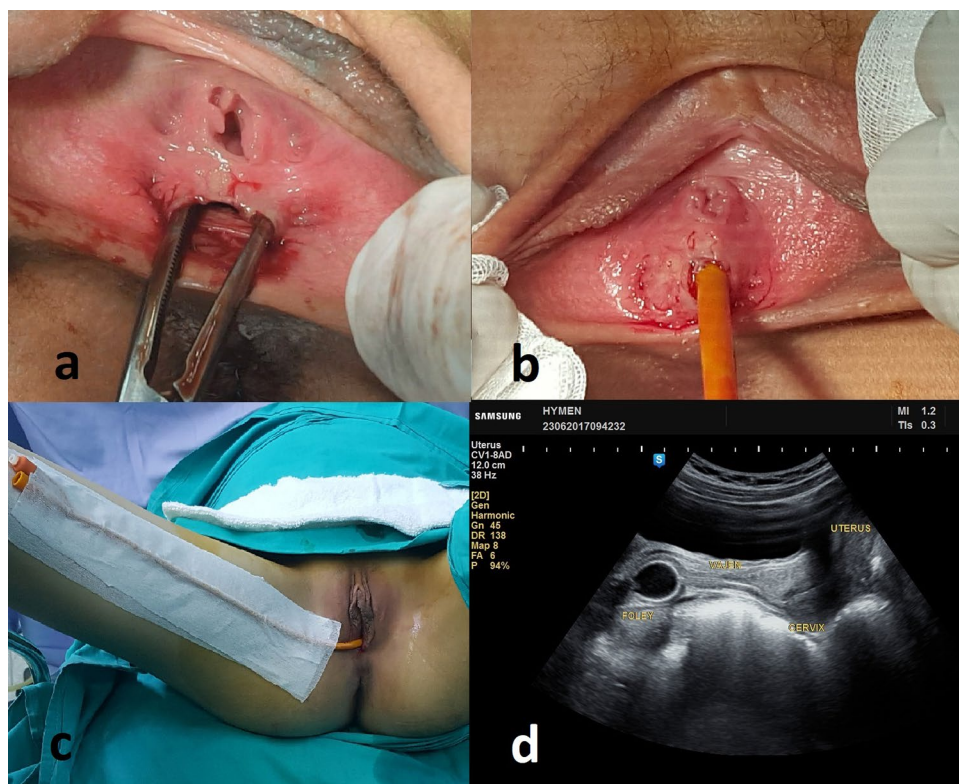
## Results

The mean patient age at the time of this study was  $28.3 \pm 2.6$  years, and the mean age at diagnosis was  $13.2 \pm 2.5$  years. Complications, such as bleeding and infections after the procedure, were not seen. The mean marriage age in these patients was  $23 \pm 2.4$  years. Hematocolpos was identified

**Fig. 1** **a** Image of imperforate hymen; **b** ultrasonographic appearance of hematocolpos



**Fig. 2** Foley catheter placement steps and the appearance of the catheter in the vagina by ultrasound. **a** Extension of hymenal incision; **b** Foley catheter placement and inflation of balloon with 10 cc saline; **c** insertion of Foley catheter; **d** the appearance of the Foley catheter in the vagina (hematocolpos was drained)



**Fig. 3** Postoperative appearance of the hymen during the first month

in all 30 women (100%). Hematometra was identified in all six women (20%). Demographic and clinical characteristics are presented in Table 1.

The procedure for imperforate hymen that aimed to keep the hymen intact resulted in satisfactory relief of symptoms for all but two patients, who each required a repeat operation for hymen reformation after the initial surgery. Twenty-nine (96.6%) patients experienced vaginal bleeding during their first sexual intercourse experience, and one patient (3.4%) did not. In two of the patients' (6.6%) vaginal bleeding became severe and required hospitalization. Two and three units of erythrocyte suspension transfusions were given to those patients, respectively. Their vaginal lacerations did not require surgical repair.

Fourteen out of 30 married women became pregnant. Of those women, nine delivered vaginally and five required a cesarean section. Of the patients undergoing renal ultrasound, none had any apparent anomalies and only one had a uterine anomaly, which was a bicornuate uterus.

## Discussion

An imperforate hymen, which is a congenital anomaly of the female genital tract, is a layer of connective tissue that obstructs the vaginal opening at the level of the introitus. Sufferers of this condition are generally between 13 and 15 years of age, and they tend to come to emergency services with complaints of cyclic lower abdominal pain and dysuria; some complain of acute urinary retention [4]. In this study, the mean patient age at the time of diagnosis was  $13.2 \pm 2.5$  years.

Difficulty during intercourse is rarely a clinical symptom [4], and in our study, none of the patients had attempted intercourse prior to their diagnosis of imperforate hymen.

Treatment includes a simple surgical procedure with one of various types of incisions, including either an X, T, or cruciform incision, which is made through the hymeneal membrane. Notably, the hymeneal structure can be damaged [5]. Because the hymen is acknowledged as a mark of virginity, harm to the hymen may cause social problems in some cultures and/or families, even though the true function of the

Fig. 4 Study flowchart

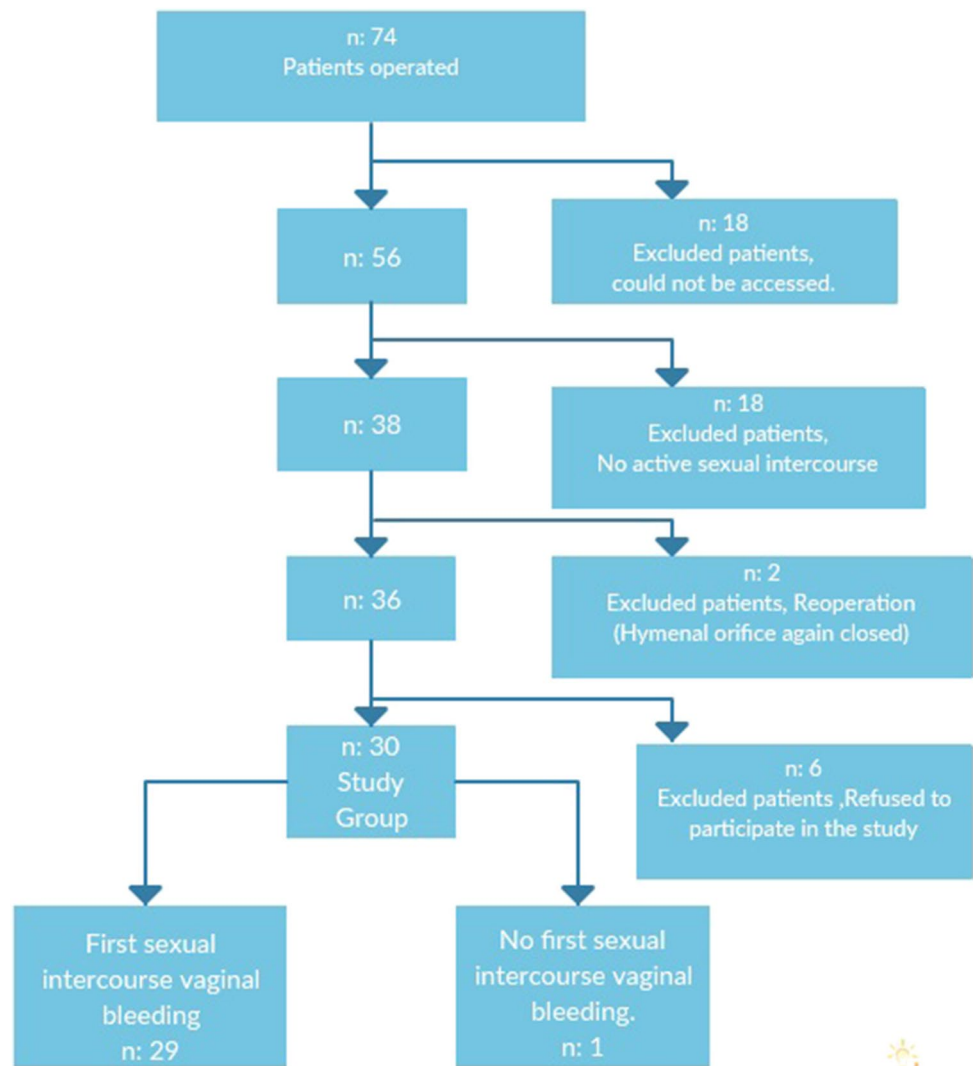


Table 1 Demographic and clinical characteristics of the study population

	n=30 (mean ± SD or %)
Age (years)	28.3 ± 2.6
Diagnosis age (years)	13.2 ± 2.5
Marriage age	18 ± 1.0
Gravidity	1.2 ± 0.2
Parity	0.6 ± 0.1
Abortion	0.6 ± 0.2
Hematocolpos	30 (100%)
Hematometra	6 (20%)
Operation time (min)	16 ± 2.0
Vaginal bleeding during first sexual intercourse	29 (96.6%)

hymen is unknown [6]. Although it is generally mentioned in Islam, an intact hymen is not a necessity as a formal

Islamic law, and the desire for virginity is seen in many other cultures as well. In Eastern countries, as a part of culturally sensitive practices that involve virginity, conservative management might be an alternative surgical option for all patients [3]. In this study, 29 patients (96.6%) experienced vaginal bleeding during their first sexual intercourse experience. Only the above mentioned method has been used in our clinic for many years for imperforate hymen surgery; hence, no control group was available for comparison. In addition, there was no information on this subject in the literature. However, there were several case reports available [3, 7]. We previously reported the technique in 2003 and 2007. Now, we can show the results of our technique in an expanded number of women with long-term results [8, 9].

According to one opinion, hymenal tissue in imperforate hymen is somewhat thicker than the borders of a “normal” hymen. Therefore, a simple incision and sutures will eventually form a thick posterior rim of hymenal tissue that is appropriate for defloration during sexual intercourse [3].

Only a few associated anomalies, such as those of the ureter and kidneys, have been reported with imperforate hymen [10]. Thus, extensive investigation of urogenital anomalies is often unnecessary for patients with imperforate hymen. Our study, which used basic pelvic and renal ultrasounds, found that, except for one patient who presented with a concomitant uterine anomaly (bicornuate uterus), all included patients had uncomplicated imperforate hymen. Case reports on hymen sparing surgeries are also published in the literature [11, 12].

In cultures where damage to the hymen is a social problem in unmarried girls, it is important to protect its circular structure in gynecological practice. We prefer the simple central circular incision of the hymen and application of a Foley's catheter. In conclusion, a simple incision and placement of a Foley catheter might be an alternate approach to the treatment of an imperforate hymen.

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## Compliance with Ethical Standards

**Conflict of interest** No conflict of interest was declared by the authors.

**Ethical approval** The manuscript follows the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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