Case Report

Management and Prevention of Postoperative Complications in a Neonate with a Symptomatic Imperforate Hymen

Frances Grimstad MD *, Julie Strickland MD, MPH, Tazim Dowlut-McElroy MD, MS

Department of Surgery, Children's Mercy Hospital, Kansas City, Missouri

A B S T R A C T

Background: Untreated symptomatic imperforate hymens at birth can result in renal complications and ascending infection. Although guidelines recommend incision and drainage, little is discussed regarding postoperative management and surveillance.
Case: A 2-day-old infant with symptomatic imperforate hymen (hydrometrocolpos and hydronephrosis) underwent incision and drainage using sterile technique. On postoperative day 19 she developed hymen reclosure, fluid reaccumulation, and concern for sepsis. After stabilization, redrainage was performed in the operating room with interrupted suture placement around an annular incision. She rapidly improved. Serial postoperative follow-up was performed to ensure ongoing patency of the hymen during healing.
Summary and Conclusion: Neonatal hymenotomies can have postoperative complications. We recommend consideration of annular suture placement and close follow-up, because of risk for reclosure and rapid deterioration from infection in this age range.
Key Words: Hymenectomy complications, Neonatal imperforate hymen, Symptomatic imperforate hymen

Introduction

It is rare to manage an imperforate hymen in infancy. Most are not found until puberty because they are often asymptomatic at time of delivery. The quoted incidence of imperforate hymen is wide varying from 1/1000 to 1/2000.[1,2] Discovery of imperforate hymen at birth is usually due to symptomatic hydrocolpos (fluid in the vagina) or hydrometrocolpos (fluid in uterus and vagina), which is caused by fluid secreted by vaginal and cervical glands and carries an incidence of less than 1 in 30,000 live births.[3] If the child is asymptomatic when imperforate hymen is noted, standard management offers delay to incise until puberty, especially if they are outside of the estrogenic phase of early infancy. If the imperforate hymen is symptomatic in infancy, it should be incised and fluid drained.[4] Symptomatology is generally defined as obstructive findings seen regarding renal, bladder, and bowel function.[4,5] Failure to treat symptomatic imperforate hymens at birth can result in worsening hydronephrosis, renal scarring, and/or development of ascending infection; failure to treat at menarche can result in those complications in addition to worsening retrograde menstruation and dysmenorrhea.[1,5] Although standard incision and drainage can be simple, the condition is rare, thus practice approaches continue to evolve as more are performed, and techniques and complications are informed by cases in the literature. To add to this growing body of understanding regarding the management and complications associated with symptomatic imperforate hymens in infancy, we discuss a case with rapid postoperative deterioration due to complications, which has led our practice to change follow-up management of this condition.

Case

This infant initially presented to our institution at 2 days of life. She was born full term via uncomplicated vaginal delivery. At the 20-week perinatal ultrasound examination she was noted to have unilateral hydronephrosis, which was monitored in pregnancy and only increased slightly. Postnatal imaging (Fig. 1) noted a large fluid-filled mass in the pelvis with worsening hydronephrosis and she was transferred to our institution for further management. On initial presentation she was found to have an imperforate hymen with positive bulge using the Credé maneuver. The imaging findings would recommend drainage via incision. This was performed in a sterile fashion in the neonatal intensive care unit; 40 mL of white mucous fluid was drained. She was discharged home the same day. She was doing well until 3 weeks of age when she began having poor feeding, increased fussiness, foul odor on diaper changes, and abdominal distension as well as rash on her lower abdomen. On exam she was afebrile but had an elevated white count, her perineum was erythematous and swollen with taught skin, and her hymen was taught and bulging (Fig. 2). On ultrasound examination and computed tomography imaging she had reaccumulation of the hydrometrocolpos, persistent hydronephrosis (Figs. 3 and 4), and new labial edema. She was admitted and medically stabilized. She was then taken back to the operating room, where an annular incision was made in the hymen, purulent drainage was noted, and sutures were placed at 3, 6, 9, and 10 o'clock reapproximating the hymenal edges to the vestibule. Vaginal cultures returned positive for *Escherichia coli*.

The authors indicate no conflicts of interest.

* *Address correspondence to:* Frances Grimstad, MD, Department of Surgery, Children's Mercy Hospital, 2401 Gillham Rd, Kansas City, MO 64108; Phone: (415) 812-5209; fax: 816-855-1799
E-mail address: fgrimstad@gmail.com (F. Grimstad).

1083-3188/$ - see front matter
https://doi.org/10.1016/j.jpag.2019.04.003

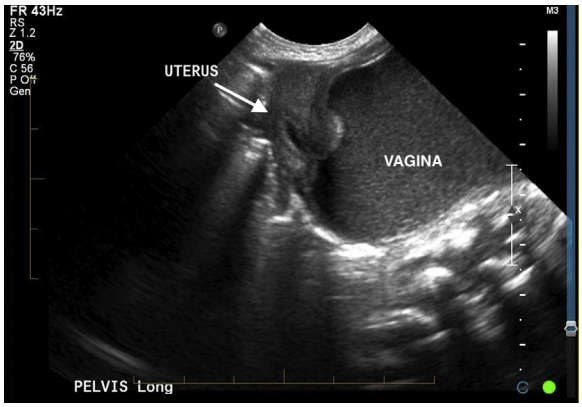

Fig. 1. Postnatal imaging with hydrocolpos.

The patient had rapid improvement of her infection and was discharged home on postoperative day 4. She received a total of 7 days of antibiotics. Follow up 2 days after discharge noted a stable patient with clinical improvement, and hymen was noted to be patent. She was again followed-up 4 weeks later for reevaluation and her hymen was noted to be patent and incision well healed. Hydronephrosis continued to be followed by Urology with interval improvement and only minimal residual hydronephrosis seen at 2 months.

Summary and Conclusion

To our knowledge, this is the first reported case of reclosure of a hymenectomy in an infant, which addresses important components of the management of imperforate hymen during infancy. First, hymenectomy should be reserved for symptomatic infants because of the risks of surgical intervention. Hymenectomy was indicated in our patient because of hydronephrosis seen on renal/bladder ultrasound imaging. Before surgical intervention, patients should obtain imaging (ultrasound or magnetic resonance) for delineation of abdominopelvic anatomy. An imperforate hymen is often an isolated anomaly due to a failure of the final stage of the canalization of the female reproductive tract where the invagination of the urogenital sinus meets the elongation of the Müllerian ducts. It is important, however, to recognize any higher Müllerian anomalies such as a transverse septum, which would potentially change the surgical approach.

Second, consideration should be made for the use of suture or mechanical dilator at the time of the hymenectomy to decrease the risk of closure and subsequent complications. Classically the cruciate or annular incisions are used (Fig. 5).[4] Utilization of a Foley catheter after the surgery to maintain patency has been described in

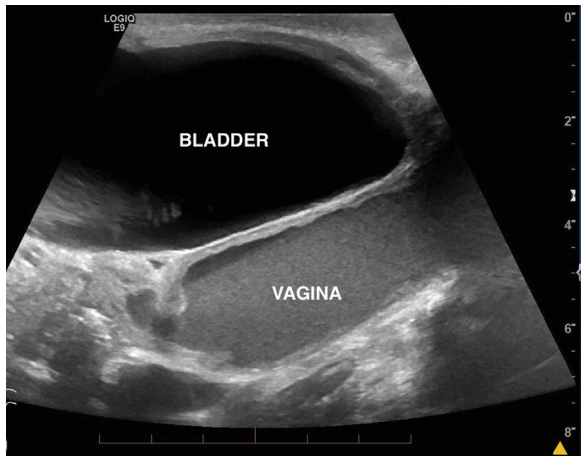

Fig. 3. Reaccumulation of hydrocolpos shown on ultrasound imaging.

Fig. 2. Resealed hymen with pyocolpos and surrounding infection.

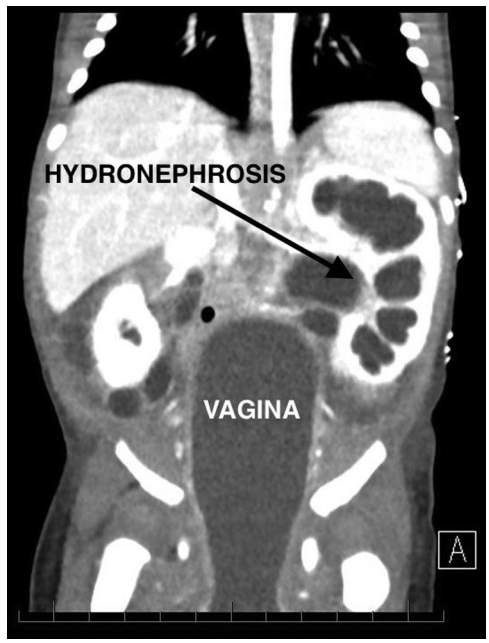

Fig. 4. Reaccumulation of hydrocolpos and hydronephrosis on computed tomography scan.

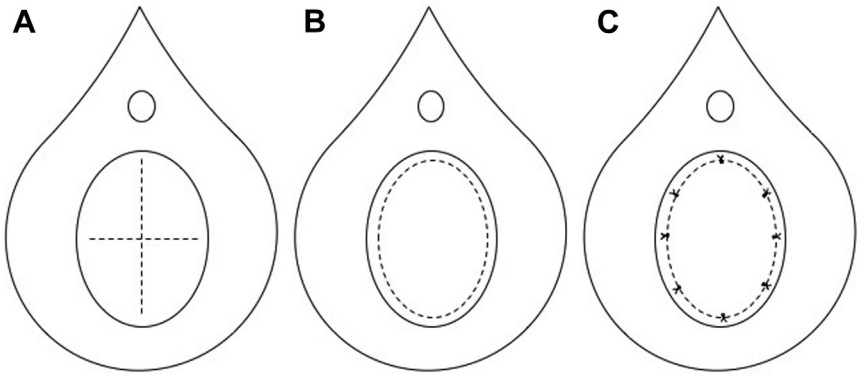

Fig. 5. Hymenectomy surgical approaches include (A) cruciate, (B) annular, and (C) annular with suture.

reproductive age women.[2] Serial dilation has also been described for the treatment of microperforate hymens in reproductive age women to avoid surgery.[6]

Last, consideration should be made for careful post-procedure follow-up to evaluate for reclosure of the hymen and the subsequent development of infection due to the now-contaminated vaginal fluid. There are reported cases of complications after hymenectomy albeit in older patients. One case was of a 16-year-old adolescent whose hymen was initially treated with annular incision with Foley catheter placement and who had reclosure of the hymenal scar 2 months after, was subsequently reopened in a similar fashion and then resealed once more, and ultimately opened with an annular incision with continuous locking sutures with successful long-term patency. Concern with this patient was for possible sexual trauma causing recurrent scar tissue, because the patient was otherwise adequately estrogenized.[7] The risk of postoperative infection after hymenectomy is still unknown.

There have been cases published of imperforate hymens presenting in young children with signs and symptoms of systemic infection thought to originate from urinary tract infections. A 3-month-old infant with imperforate hymen had purulent vaginal fluid obtained using initial needle aspiration, suggesting possible hematologic or other seeding of infection of the hydrometrocolpos even before penetration of the sterile hymen.[3] Another case report was of a 2-year-old child found to have pyocolpos with imperforate hymen, complicated by lobar nephronia, which suggested rapid hematologic spread of infection.[5] Historically, because this fluid is sterile, needle aspirations are contraindicated because they have been found to introduce infection.[8]

Although none of these infections occurred after sterile surgical hymenotomies, they reinforce that, in this patient population, infections in the setting of imperforate hymens can occur, and suggest that postoperative complications of reclosure (with now nonsterile fluid within the vagina) might progress rapidly, thus justifying the need for close follow-up to ensure continued drainage and patency while the area heals. This is especially important in infants compared with adolescents who typically undergo hymenectomy after the onset of puberty and the estrogenization of genital tissue. Unlike verbal adolescents, infants lack the ability to express early symptoms of reclosure, such as pressure and pain in the genitalia and/or abdomen. This places infants at risk of later presentation after reclosure of the hymen with increased risk of systemic complications including ascending infection from a pyocolpos, which might increase the risk of infertility. In the case of our patient, the placement of a small Foley bulb within the vagina with subsequent removal a few days later might have prevented reclosure with subsequent infection. Because of our experience and literature review, our practice will now include close serial follow-up of these infants who undergo hymenectomy to ensure ongoing hymenal patency and early detection of reclosure and/or infection.

References

1. Practice Committee of American Society for Reproductive Medicine: Current evaluation of amenorrhea. Fertil Steril 2008; 90(5 suppl):S219
2. Acar A, Balci O, Karatayli R, et al: The treatment of 65 women with imperforate hymen by a central incision and application of Foley catheter. BJOG 2007; 114: 1376
3. Brevetti LS, Kimura K, Brevetti GR, et al: Pyocolpos: diagnosis and treatment. J Pediatr Surg 1997; 32:110
4. Emans SJ, Laufer MR, Emans Laufer: Goldstein's Pediatric and Adolescent Gynecology. Philadelphia, PA, Lippincott Williams & Wilkins, 2012
5. Shen MC, Yang LY: Imperforate hymen complicated with pyocolpos and lobar nephronia. J Chin Med Assoc 2006; 69:224
6. Segal TR, Fried WB, Krim EY, et al: Treatment of microperforate hymen with serial dilation: a novel approach. J Pediatr Adolesc Gynecol 2015; 28:e21
7. Ossman AME, El-Masry YI, El-Namoury MM, et al: Spontaneous Reformation of imperforate hymen after repeated hymenectomy. J Pediatr Adolesc Gynecol 2016; 29:e63
8. Lok IH, Yip SK: Iatrogenic pyocolpos in a young girl with imperforate hymen. Aust N Z J Obstet Gynaecol 2001; 41:104