Novel use of a tracheobronchial stent in a patient with uterine didelphys and obstructed hemivagina

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Objective: To describe a novel use for a tracheobronchial stent to maintain patency after vaginal septum excision in a patient with an obstructed hemivagina and uterine didelphys.
Design: Description of a novel technique.
Setting: University-affiliated children's hospital.
Patient(s): One patient with an obstructed hemivagina and uterine didelphys who presented with hematometria and hematocolpos.
Intervention(s): To maintain patency and decrease stenosis risk after vaginal septum excision, a coated tracheobronchial stent was deployed and left in place for 6 weeks.
Main Outcome Measure(s): To evaluate ease of stent placement and removal, reepithelialization and patency of the neovagina, and postoperative assessment of pain and recurrent obstruction.
Result(s): The tracheobronchial stent was easily positioned and deployed with vaginoscopic guidance. Six weeks later it was removed without any tissue ingrowth or granulation tissue noted. The vaginal walls were nicely epithelialized. Twelve months postoperatively, the patient remained pain free with regular cycles and no evidence of obstruction or abnormality on ultrasound.
Conclusion(s): Use of a coated tracheobronchial stent to maintain patency after septum excision in a patient with an obstructed hemivagina presents a safe, easy, and effective option to diminish stenosis risk and avoid infectious complications or hysterectomy. (Fertil Steril® 2010;93:900–3. ©2010 by American Society for Reproductive Medicine.)

Key Words: Obstructed hemivagina, uterine didelphys, stenosis after vaginal septum excision, hematocolpos, Müllerian anomaly, Herlyn-Werner-Wunderlich syndrome (HWWS), obstructed hemivagina and ipsilateral renal anomaly (OHVIRA), stent

The processes of lateral fusion, vertical fusion, and resorption are all intricately involved in the creation of the uterus and vagina, beginning in the early embryo. Furthermore, the close relationship between the urinary and reproductive systems (Müllerian and metanephric ducts) leads to the coexistence of anomalies in the renal collecting system and the reproductive tract. Failure of fusion of the Müllerian ducts can result in a uterine didelphys in some cases, and further failure of canalization or resorption in the uterovaginal canal or urogenital sinus can lead to a vaginal septum (1, 2). Specifically, the combination of uterine didelphys, obstructed hemivagina, and ipsilateral renal agenesis is a variant of the broad spectrum of Müllerian anomalies that is being diagnosed and reported more frequently with increasing awareness and advances in radiological imaging. This variant has been referred to in the literature as the Herlyn-Werner-Wunderlich syndrome (HWWS) as well as the obstructed hemivagina and ipsilateral renal anomaly syndrome (OHVIRA) (3–6). Young adolescents with this disorder usually present with abdominal pain shortly after menarche.

Excision of the vaginal septum is the treatment of choice, usually through a single-stage surgery, to drain the hematometrocolpos. Many surgeons wait to perform the vaginal septum resection until a large hematocolpos builds up to distend and thin the septal tissue and allow for an easier excision. In these patients, the bulging hemivagina is easily seen and palpated. If the vaginal septum is fully excised, the outflow track is likely to remain patent, and normal function of the ipsilateral uterus will often resume. If the septum is inadequately excised, reobstruction may occur, as well as recurrence of hematometra and/or hematocolpos. Yet, if the hematometra distends the uterus significantly while awaiting surgery or it continues to recur, uterine function may ultimately be compromised (7). If the patient's symptoms warrant intervention before a bulging mass is presenting low in the vagina or the obstructed hemivagina is located high in the pelvis, excision of the vaginal septum can be challenging. The high location of a thick septum, the small caliber of the adolescent vagina,

Received September 19, 2008; revised October 6, 2008; accepted October 17, 2008; published online December 6, 2008.
A.R.C. has nothing to disclose. D.F.M. has nothing to disclose.
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0015-0282/10/$36.00
doi:10.1016/j.fertnstert.2008.10.022

FIGURE 1

Deployment of the AERO (Alveolus, Inc.) tracheobronchial stent 3 days after initial left hemivaginal septum excision. The stent is inserted and deployed with a one-handed technique under vaginoscopic guidance.

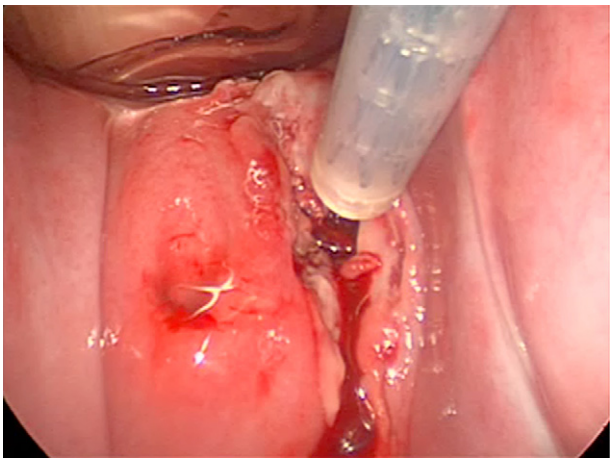
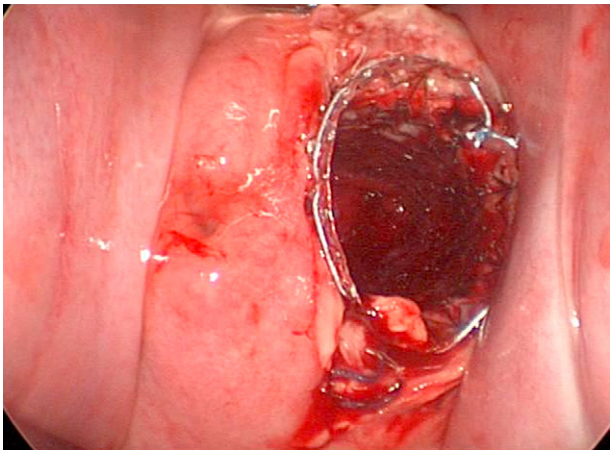


Photo Courtesy of Dr. Diane F. Merritt

Cooper. Novel stent use for hemivaginal septum. Fertil Steril 2010.

FIGURE 2

Vaginoscopic view of the tracheobronchial stent after deployment. Radial expansion keeps the stent securely in place and prevents stenosis of the area. The length of the stent extends from just caudal to the area of septal excision up to the level of the left cervix.



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Cooper. Novel stent use for hemivaginal septum. Fertil Steril 2010.

and the intact hymenal tissue contribute to the surgical difficulty. The hematocolpos may be located very close to the cervix of the unobstructed uterine corpus. Given the difficulty of an adequate septum resection and the collapsed nature of the vaginal walls, postoperative vaginal stenosis of the septal orifice is a significant possibility. Even high transverse septae across the entire vagina without associated uterine anomalies have been reported to have risks of contracture and stenosis within weeks to months postoperatively. Some surgeons encourage specific operative techniques, such as a "Z"-plasty, as well as pre- and/or postoperative vaginal dilation to reduce contracture or stenosis risks (8, 9). More recently, some have even suggested use of a vaginal mold secured to an elastic belt, which is used while sleeping, or a Penrose drain (10, 11). Dilation or specific operative techniques become more difficult in the case of small or high hemivaginal septae. We present a specific case using a novel technique and instrumentation to maintain patency after septum excision and decrease the risk of stenosis and reoperation postoperatively.

MATERIALS AND METHODS

The patient is a 13-year-old G0, otherwise healthy, young adolescent, who presented to her primary care physician with dysmenorrhea and abdominal and rectal pain. She had recently undergone menarche and had three uneventful periods. During her fourth menstrual cycle she presented with pain. An ultrasound was performed and reported a hematocolpos and possible imperforate hymen. A local gynecologist, upon physical exam, recognized a more complicated Müllerian anomaly. On pelvic magnetic resonance imaging (MRI), two uterine bodies were identified. The right side had a normal endometrial cavity, a cervix, and a single vagina. The left uterine horn was enlarged, and hematometria and hematocolpos were noted. The ovaries were normal except for a simple left ovarian 3-cm cyst, and left renal agenesis was noted. The MRI studies were forwarded to multiple consultants. The patient was given a single injection of a GnRH agonist to prevent another menses while awaiting the recommendation of the consultants. Unfortunately, 2–3 weeks later the patient started another period and presented to the emergency room with intractable pain. She was treated with narcotics and eventually air-evacuated to St. Louis Children's Hospital for consultation with the pediatric gynecology service. The next morning the patient was operated on, and a distended obstructed hemivagina was not found by an exam under anesthesia. A single normal appearing cervix was seen. Upon bimanual examination, induration was noted in the left vaginal fornix and a large left abdominopelvic mass was palpated. An 18-gauge spinal needle mounted on a saline-filled syringe was directed into the left fornix, and dark brown fluid returned. An initial incision was made, and over 500 mL of old blood was drained. Ultimately, a 2-cm^3 section of vaginal septal tissue was removed, and dilation of the neovaginal opening was attempted. Despite resection of as much tissue possible, the opening remained significantly narrow and could not be extended because of apposition of the right cervix and left pelvic sidewall. After the vaginal procedure, a diagnostic laparoscopy was performed to evaluate the persistence of the pelvic mass. The findings included widely divergent uterine horns, an enlarged 10-cm