

Two-balloon epistaxis catheter to ensure vaginal patency in a complex case of vaginoplasty for vaginal agenesis: a case report

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Abstract

Congenital vaginal atresia is a rare anomaly of the female genital tract. Many vaginoplasty procedures have been described, but the postoperative risk of vaginal stenosis remains a challenge. We report a case of isolated distal vaginal agenesis in a patient with neurological impairment where the use of an “alternative” dilator was needed. An 11-year-old girl with Down syndrome was admitted to the Emergency Department complaining of pelvic pain. The

clinical evaluation showed a hard and painful pelvic mass associated with an imperforate hymen. Abdominal ultrasound and pelvic MRI were suggestive for hematometrocolpos and absence of the lower third segment of the vagina. Vaginostomy confirmed the diagnosis of congenital vaginal agenesis. The patient then underwent a laparoscopic-assisted vaginoplasty. Considering the difficult management of the postoperative period, an epistaxis catheter was used as a vaginal stent and dilator. The use of an epistaxis catheter to provide adequate vaginal patency after vaginoplasty can be an alternative solution especially in those cases where calibrations with dilators are difficult or not tolerated.

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Introduction

Vaginal agenesis is a rare müllerian anomaly with an incidence of 1 of every 4,000-10,000 females,¹ but represents 15% of obstructive anomalies of the female reproductive tract.² During the organogenesis, the upper third of the vagina develops from the Müllerian ducts, while the lower two thirds from the urogenital sinus.³ Afterward, processes of fusion and absorption lead to canalization forming the vaginal cavity.² The failure in the canalization process leads to congenital vaginal atresia.⁴ Nonsurgical creation of the vagina has been identified as the first line treatment, while surgical reconstruction should be performed in case of dilatation ineffectiveness or in selected cases.¹ However, the nonsurgical management as well as the postoperative dilatations require an active participation of the patient. We present the case of an isolated partial vaginal agenesis. Vaginoplasty was performed through a laparoscopic-assisted approach and an epistaxis catheter was used postoperatively as a dilator to minimize the patient's discomfort.

Case report

An 11-year-old girl with Down syndrome mosaicism was referred to our department for chronic pelvic pain. Clinical examination revealed signs of pubertal development (Tanner stage 3) and a hard, non mobile, painful pelvic mass. Gynecologic examination showed a normal appearance of the external genitalia with a bulging, thick and cribriform hymen very painful to palpation. An abdomen ultrasonography showed an empty uterine and cervical cavity with an hematocollection of 67x54 mm (Figure 1). In the suspicion of hematocolpos due to imperforate hymen, the patient underwent an hymenotomy. The procedure was unfortu-

nately unsuccessful with no drainage of fluid. To better understand the anatomy of the vagina, the girl was subsequently investigated with a pelvic MRI, which confirmed the fluid collection involving the uterus down to the upper third of the vagina, but revealed the agenesis of its lower third. The agenic tract measured about 5 cm from the perineal plan (Figure 2). Uterus, ovaries, tubes and cervix had no anomalies. The diagnosis of partial vaginal agenesis was made and laparoscopic-assisted vaginoplasty was planned after case discussion with our gynecologists.

Surgical technique

The patient was placed supine in gynecological position and the surgical field set up for a combined laparoscopic and perineal approach. A urinary catheter was inserted. After the insertion of the infraumbilical port, the pneumoperitoneum was created and other two ports were placed in the right and left flank, respectively. The abdominopelvic cavity was carefully assessed and careful dissection of the vesicouterine and rectouterine spaces allowed a better mobilization of the dilated uterine body, cervix and vagina. The peritoneal reflection was incised, a 0.5 cm incision was made laparoscopically in the dilated upper third of the vagina with a monopolar hook and the hematometrocolpos was drained (Figure 3). Through the same incision, a probe was inserted and the vagina was pushed toward the retrohymenal dimple. The procedure was then switched to perineal approach. An incision of the retrohymenal dimple was performed and a tunnel between the urethra and the rectum realized (Figure 4). The urinary catheter and two fingers placed in the rectum were used to prevent injuries. The vaginal pouch was pushed caudally by an assistant until the operator grasped it from the perineal access. The pouch was opened and sutured circumferentially at the vulva introitus with multiple interrupted absorbable sutures. Muscle fibers of bulbospongiosus and transversum perinei were sutured on the midline and interposed between neo-vagina and rectum. Labioplasty was performed with the redundant tissue of the dilated pouch. The pneumoperitoneum was re-established, the vaginal incision was laparo-

scopically sutured and the anastomosis was checked and appeared without traction. At the end of the procedure, the vaginal canal was calibrated with Hegar 10 and kept open with a roll of greasy gauze.

Postoperative follow up

In the following 40 days, the roll of greasy gauze, used as a vaginal dilator, was replaced weekly in general anesthesia due to the patient's non compliance. After that, the patient started calibrations with Hegars every 15 days but she was readmitted for recurrent hematocolpos. The hematocolpos was drained after vaginoscopy with evidence of vaginal stenosis located 4 cm up to the introitus. For this reason an epistaxis catheter, commonly used by the otolaryngologists for posterior epistaxis, was inserted into



Figure 1. Ultrasonography showing the fluid collection (67x54 mm) inside the uterus.

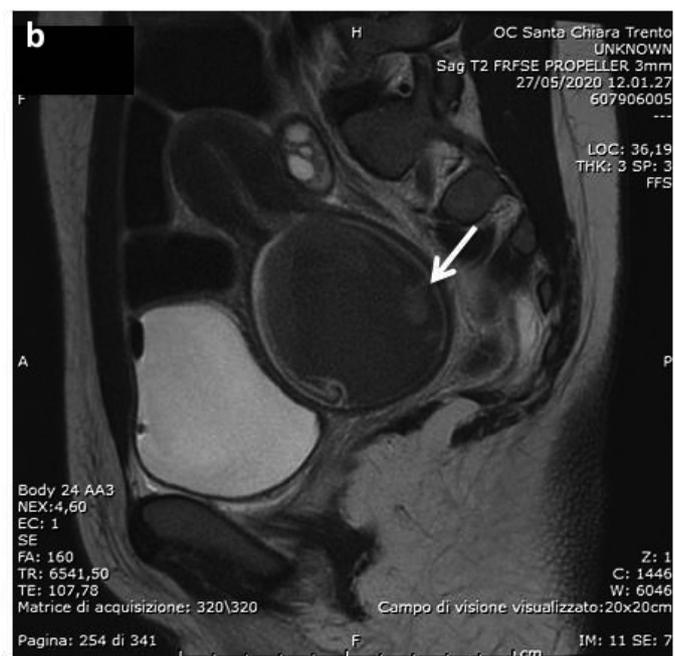
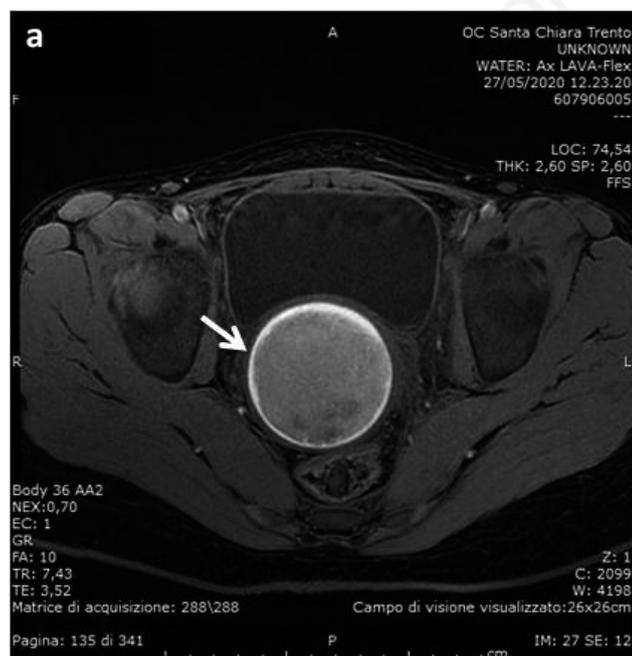


Figure 2. Pelvic MRI: a) transverse plane; b) sagittal plane. The hematometrocolpos measured 70x56 mm (arrows) and affected the uterus until the upper third of the vagina. The lower third was absent.

the neovaginal canal (Figure 5a). This catheter is formed by a silicone tube that has two independent inflatable cuffs (the distal balloon with a maximum of 10 cc of saline solution and proximal one with a maximum of 30 cc). The distal one was placed under vision at the stenotic ring and inflated with 10 cc of saline solution; the exit did not need to be secured (Figure 5b). The patient was followed up with outpatient visits and the catheter was changed once a month. The balloon remained correctly inflated without losses of



Figure 3. Vaginal pouch isolated and drained.



Figure 4. Vaginal tunnel realized through perineal approach (arrow).

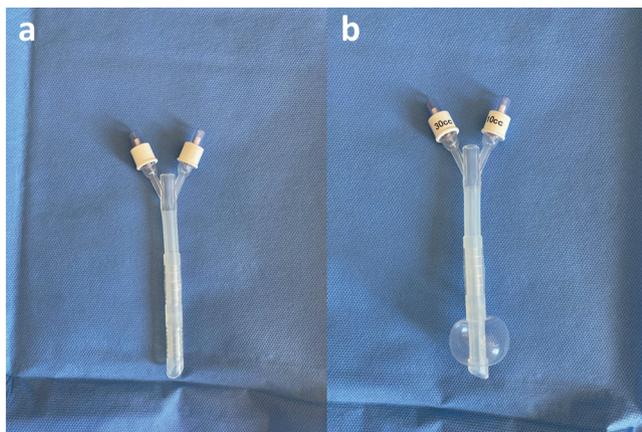


Figure 5. a) Double balloon epistaxis catheter 120 mm; b) with the distal balloon inflated with 10 cc.

the saline solution during the observation. We suggested to the patient to wash the catheter with 3-5 cc of water using a syringe during menstruation. Indeed, the probe was never obstructed by the menstrual cycle. After 6 months, we performed a vaginoscopy that showed a patent vaginal canal with a complete dilation of the stenotic tract. The epistaxis catheter was removed and the patient started the calibrations with greater compliance. After 1 year, the vagina was explorable with a 28ch rectal probe and the patient had a regular menstrual cycle.

Discussion and Conclusions

Distal vaginal agenesis accounts for 5% of all (complete, proximal and distal) vaginal agenesis.⁵ Given the low frequency in the female population, there is not a universal consensus about the treatment of choice and type and timing of dilation. Laparoscopy is useful in the visualization of the abdominal anatomy and can detect intra-abdominal complications during distal dissection.⁶ In the case reported, the laparoscopic approach helped us to better understand the anatomy of the congenital abnormality, to perform a minimally invasive isolation of the vaginal pouch and it guided the pull-through procedure. In the analysis of the postoperative course after pull-through vaginoplasty, Mansouri *et al.*⁷ reported vaginal stenosis in cases with the atretic tract >3 cm, suggesting the importance of a dilation program. According to them, our patient had an atretic tract of 5 cm and developed a postoperative vaginal stenosis. Indeed, vaginal stenosis is the most common late complication and several devices or topic treatments are used after surgery in order to avoid stricture formation.⁵ Among these, silicone stents are largely employed due to the high biocompatibility,⁸ the use of tracheo-bronchial stents has also been described.⁹ To the best of our knowledge, this is the first case reported of an epistaxis catheter applied as a vaginal stent. The posterior epistaxis catheter is made of medical-grade silicone that ensures the cuffs will remain soft and compliant, preventing adherence to vaginal mucosa. Unlike other dilators, such as the roll of greasy gauze, this catheter was better tolerated by the patient and can be replaced easily, reducing discomfort. Furthermore, we allowed the patient to have a patent vaginal canal and a constant dilatation of the stricture thanks to the pressure exerted by the upper balloon. This case demonstrates that the epistaxis catheter could be a good option in patients with neurological impairment and in those cases where it is difficult to achieve efficient calibrations.

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