Published in final edited form as:

Fertil Steril. 2008 November ; 90(5): 2005.e15–2005.e17. doi:10.1016/j.fertnstert.2008.07.1752.

Balloon Fluoroscopy as Treatment for Intrauterine Adhesions: a Novel Approach

Rebecca J. Chason, M.D.^a, Eric D. Levens, M.D.^c, Belinda J. Yauger, M.D.^{b,c}, Mark D. Payson, M.D.^b, Kenneth Cho, M.D.^b, and Frederick W. Larsen, M.D.^b

^aNational Naval Medical Center, Bethesda, MD

^bWalter Reed Army Medical Center, Washington, D.C.

^cProgram in Reproductive and Adult Endocrinology, NICHD, NIH, Bethesda, MD

Abstract

Objective—To report a unique fluoroscopically guided approach to treat severe intrauterine adhesions and cervical stenosis using balloon hystero-plasty.

Design—Case report.

Setting—Military-based fertility center.

Patient—A 33-year-old woman undergoing assisted reproductive technologies whose uterus could not be cannulated because of the development of intrauterine synechiae and cervical stenosis following a post-intrauterine insemination infection that was further complicated by a prominent lower uterine segment filling defect in the location of a prior cesarean delivery scar.

Intervention—Fluoroscopic cannulation and balloon uterine dilation.

Main Outcome Measure—Resolution of synechiae by hysterosalpingogram and successful uterine cannulation.

Results—A post-procedure hysterosalpingogram demonstrated a normalized uterine cavity with the exception of a persistent prominent lower uterine segment filling defect from a prior cesarean delivery. A frozen embryo transfer cycle was performed successfully.

Conclusions—Hystero-plasty, using standard interventional radiographic techniques, may provide an alternative treatment modality for patients with intrauterine adhesions and lower uterine defects from prior cesarean deliveries, in select cases. While treating intrauterine adhesions improves pregnancy outcome, the effect of lower uterine segment filling defects from cesarean deliveries on pregnancy outcome in assisted reproductive technology cycles warrants further investigation.

Keywords

Asherman's syndrome; synechiae; intrauterine adhesions; balloon dilation; cesarean section scar

Correspondence: Rebecca J. Chason, M.D., c/o Ms. Penny Croyle, National Naval Medical Center, Building 1, Room 2435, 8901 Rockville Pike, Bethesda, MD 20889-5600, Tel: 301-295-2048, Fax: 301-295-1988.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Disclosure: The opinions or assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting the views of the Department of Health and Human Services, the Department of the Army, or the Department of Defense.

Introduction

Intrauterine adhesions occur in 1.5–3% of infertile patients (1,2) and are typically diagnosed by the presence of irregular, lacunar filling defects on hysterosalpingogram (HSG) that may occur centrally or in the periphery of the uterine cavity (3). Intrauterine adhesions may make embryo transfer difficult, if not impossible to perform, may interfere with implantation due to insufficient normal endometrium, and may alter endometrial blood supply resulting in defective vascularization (4). Hysteroscopy has become the mainstay for the evaluation of suspected intrauterine adhesions as it allows for direct visualization of the uterine cavity and provides the opportunity to treat these adhesions. However, hysteroscopy may not always be possible to perform, and when it can be successfully accomplished, it is not without its risks including anesthesia, uterine perforation, and hemorrhage.

In this report, we present a successful uterine canalization and intrauterine adhesiolysis using a fluoroscopically guided balloon catheterization in a woman with significant lower uterine segment adhesions and a large filling defect in the lower uterine segment from a prior cesarean delivery. This case highlights the novel treatment of intrauterine adhesions caused by intrauterine infection with fluoroscopy guided balloon dilation and the difficulties encountered by the presence of a large lower uterine segment filling defect.

Case Report

A 33-year-old gravida 2, para 2-0-0-2 initially presented with a one-year history of secondary infertility due to oligoovulation. The patient previously delivered two infants by cesarean section. An initial HSG was notable for a large lower uterine segment filling defect at the location of a prior cesarean delivery scar, while the remainder of the uterine cavity was normal with the confirmation of tubal patency. After verifying a normal semen analysis, the couple underwent six unsuccessful ovulatory cycles using clomiphene citrate with intrauterine insemination, after which the couple was to proceed with assisted reproductive technologies (ART). In preparation for ART, the patient underwent a sonohysterogram. Repeatedly, due to a retroflexed uterus, the catheter passed into an anterior lower uterine segment filling defect. After some difficulty, the catheter negotiated beyond the uterine defect, confirming an otherwise normal cavity without intrauterine adhesions. In the month proceeding the planned ART cycle, the patient elected to undergo another ovulation induction cycle with intrauterine insemination. Two days following the insemination, she presented with fever and severe, diffuse abdominal pain greatest in her right lower quadrant with rebound tenderness warranting laparoscopy. An acutely inflamed right fallopian tube was noted with a normal appearing appendix, consistent with an upper genital tract infection. The patient was treated with intravenous followed by outpatient antibiotic therapy.

Two months later, the patient underwent an uneventful ovarian stimulation and oocyte retrieval. Immediately prior to embryo transfer, difficulty passing a mock Wallace catheter was encountered due to a stenotic internal cervical os causing the transfer catheter to track repeatedly into the lower segment filling defect and could not be directed beyond this point. Multiple methods were attempted to aid the passage of the mock transfer catheter; however, these attempts were unsuccessful. Resultantly, the embryos were cryopreserved and an operative cervical dilation and diagnostic hysteroscopy was planned.

At the time of hysteroscopy, the patient had multiple internal cervical adhesions and dense lower uterine segment intrauterine adhesions resulting in the termination of the procedure due to safety concerns. An HSG was performed two weeks later, confirming the intrauterine adhesions involving the lower portion of the uterus (Figure, panel A). With delayed imaging, a normal upper uterine cavity and patent fallopian tubes were documented bilaterally (Figure, panel B). In light of a successful mock embryo transfer with normal saline sonogram prior to

her ART cycle, the intrauterine adhesions were most likely secondary to her recently diagnosed and treated post-procedural upper genital tract infection.

Adhesiolysis and dilation of the internal cervical os was then performed under fluoroscopic guidance and conscious sedation. The cervix was cannulated fluoroscopically with a 5-French glide catheter and Glidewire guidewire (Boston Scientific, Natick, MA) with some difficulty. The Glidewire was then exchanged with an Amplatz super-stiff wire (Cook Medical INC., Bloomington, IN). The internal cervical canal was then dilated to 5 mm then to 8 mm with Conquest balloons (Bard, Covington, GA). A 7-French sheath was inserted over the wire and the lower uterine segment was dilated with a 14 mm × 2 cm Atlas balloon (Bard Peripheral Vascular, Tempe, AZ) (Figure, panel C). Two months later a follow-up HSG demonstrated a normal cervical canal and the resolution of the lower uterine segment intrauterine adhesions (Figure, panel D). Of note, the previously diagnosed anterior lower segment filling defect from the prior cesarean delivery was unchanged. A mock embryo transfer was again successfully performed at that time and a programmed frozen embryo transfer cycle was undertaken. Although the intrauterine adhesions and cervical stenosis had resolved, the patient's embryo transfer remained difficult due to the large filling defect in the anterior lower uterine segment. However, with significant maneuvering under ultrasound guidance, three embryos were successfully transferred one centimeter from the fundus. Unfortunately, the patient did not become pregnant.

Discussion

Intrauterine adhesions are a well known complication of uterine surgery and rarely infection, first fully described by Asherman in 1948 (5). Hysteroscopic resection revolutionized treatment and has since been the standard mode of therapy. The goals of therapy are to restore a normal uterine cavity, resume normal menstruation, and improve pregnancy outcomes. Like all operative procedures requiring anesthesia, cervical dilation, and intrauterine surgery, patients are at risk of complications related to any of these elements. Several hysteroscopic techniques to improve adhesiolysis while decreasing the complication rate have been described including microhysteroscopy using a coaxial bipolar electrode system (6), adhesiolysis using the Versapoint electrode (2), and ultrasound-guided pressure lavage (7). Microhysteroscopy has been found to be a safe outpatient method that eliminates the need for cervical dilation, but does have a limited field of vision (6). The Versapoint electrode decreased the perforation rate, but few patients have complete resection of their adhesions after the first procedure (1). Although ultrasound-guided pressure lavage avoided the use of invasive surgery and fluoroscopy, the method appeared to treat only mild adhesions and none of the patients had lower uterine segment or upper cervical canal adhesions (7). While lysis of adhesions using gynecoradiologic techniques has previously been described (8), our case differs in that we used standard interventional radiology techniques, guidewires, and balloon dilators as opposed to specially designed intrauterine catheter and hysteroscopic scissors.

Our patient's case was also complicated by the presence of a large lower uterine segment filling defect, likely the result of her prior cesarean deliveries. Although lower uterine filling defects following cesarean delivery are known to result in pregnancy-related complications (9) and dysfunctional uterine bleeding (10), there is almost no literature regarding its impact on infertility and assisted reproductive techniques. Moreover, no reports or studies have addressed the impact of these defects on transcervical embryo transfer. Even though this patient's case is extreme, we suspect that many women with previous cesarean deliveries undergoing *in vitro* fertilization may have more mild difficulties with embryo transfer.

In summary, we present a case of significant lower uterine adhesions that were successfully lysed using fluoroscopic guided balloon dilation. Standard interventional radiological

techniques employed allowed for improved range of motion and better control over the size and path of the balloons, resulting in a more selective treatment of the uterine and cervical pathology. The fluoroscopic cannulation provided excellent visualization of the adhesions giving us the ability to dilate and breakdown the scar tissue that could not be resected by traditional hysteroscopic techniques. Normal intrauterine anatomy was restored. Further study exploring the outcomes of this procedure in a larger study population is warranted.

Acknowledgements

Financial Support: This research was supported, in part, by the Program in Reproductive and Adult Endocrinology of the Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, Bethesda, MD.

REFERENCES

1. Fedele L, Bianchi S, Frontino G. Septums and synechiae: approaches to surgical correction. *Clin Obstet Gynecol* 2006;49:767–788. [PubMed: 17082672]
2. Fernandez H, Al-Najjar F, Chauveaud-Lambling A, Frydman R, Gervaise A. Fertility after treatment of Asherman's syndrome stage 3 and 4. *J Minim Invasive Gynecol* 2006;13:398–402. [PubMed: 16962521]
3. Thurmond AS. Imaging of female infertility. *Radiol Clin North Am* 2003;41:757–767. [PubMed: 12899490]vi.
4. Yu D, Wong YM, Cheong Y, Xia E, Li TC. Asherman syndrome--one century later. *Fertil Steril* 2008;89:759–779. [PubMed: 18406834]
5. Asherman J. Amenorrhea traumatica (atretica). *J Obstet Gynaecol Br Emp* 1948;55:23–27. [PubMed: 18902559]
6. Marwah V, Bhandari SK. Diagnostic and interventional microhysteroscopy with use of the coaxial bipolar electrode system. *Fertil Steril* 2003;79:413–417. [PubMed: 12568855]
7. Coccia ME, Becattini C, Bracco GL, Pampaloni F, Bargelli G, Scarselli G. Pressure lavage under ultrasound guidance: a new approach for outpatient treatment of intrauterine adhesions. *Fertil Steril* 2001;75:601–606. [PubMed: 11239548]
8. Karande V, Levrant S, Hoxsey R, Rinehart J, Gleicher N. Lysis of intrauterine adhesions using gynecoradiologic techniques. *Fertil Steril* 1997;68:658–662. [PubMed: 9341606]
9. Regnard C, Nosbusch M, Felleman C, Benali N, van Rysselberghe M, Barlow P, et al. Cesarean section scar evaluation by saline contrast sonohysterography. *Ultrasound Obstet Gynecol* 2004;23:289–292. [PubMed: 15027020]
10. Thurmond AS, Harvey WJ, Smith SA. Cesarean section scar as a cause of abnormal vaginal bleeding: diagnosis by sonohysterography. *J Ultrasound Med* 1999;18:13–16. [PubMed: 9952074]quiz 7–8.

Figure.

A) The radio-opaque dye failed to fill the lower uterine segment, suggesting the presence of intrauterine adhesions; B) Delayed filling of the bilateral Fallopian tubes with a persistent failure to fill the lower uterine segment; C) An intraoperative image demonstrating the fluoroscopic balloon dilated within the lower uterine segment; D) A post-procedural hysterosalpingogram demonstrating the resolution of the lower uterine segment adhesions and normalization of the uterine cavity. Note the persistent cesarean section scar.