Title: Simple and Effective: Transvaginal Vesico-vaginal Fistula Repair
with Modified Latzko Technique

Olivia Cardenas-Trowers, M.D.¹, John Heusinkveld, M.D.¹, and Kenneth Hatch, M.D.¹

¹Department of Obstetrics and Gynecology, University of Arizona, Tucson, AZ

- Corresponding author: Olivia Cardenas-Trowers; email:
ocardenastrowers@obgyn.arizona.edu; phone: 520-626-6636; fax: 520-626-1446;
address: 1501 North Campbell Avenue, PO Box 245078, Tucson, AZ 85724.
- Financial Disclaimer/Conflict of Interest: None for all authors.
- Our video was shown on stage during Video Fest at the 2017 Society of Gynecologic Surgeons conference in San Antonio, TX on March 27, 2017.
- Author contributions:
 - O. Cardenas-Trowers: Project development, data collection, and manuscript writing.
 - J. Heusinkveld: Project development and data collection.
 - K. Hatch: Project development and data collection.

Word count: 1,070

21 Abstract:

22 Introduction and Hypothesis: The incidence of vesico-vaginal fistulas after hysterectomies for
23 benign indications in developed countries is less than 1%. The objective of this video is to
24 demonstrate an easy to follow, step-by-step approach to repairing a small, uncomplicated vesico-
25 vaginal fistula transvaginally using a modified Latzko technique.

26
27 Methods: In this video, we present a case of a 46 year old woman who developed a simple,
28 uncomplicated vesico-vaginal fistula after a total abdominal hysterectomy. To correct her
29 fistula, we used a modified Latzko technique, which is a transvaginal approach to vesico-vaginal
30 fistula repair that involves mobilizing the vaginal mucosa around the fistula and then closing the
31 pubovesical fascia and vaginal mucosa in layers.

32
33 Results: The patient had successful surgical correction of her vesico-vaginal fistula without
34 recurrence of the fistula.

35
36 Conclusions: For small, uncomplicated vesico-vaginal fistulas, a transvaginal approach has
37 equivalent success rate as other approaches with less invasiveness and faster recovery times.
38 Therefore, it is reasonable to use a modified Latzko technique to help restore the quality of life to
39 women affected by small, uncomplicated vesico-vaginal fistulas.

40 Keywords: fistula surgery, Latzko, surgical technique, vesicovaginal fistula

41

Brief summary: A modified Latzko technique is an easy and effective transvaginal approach to repair simple, uncomplicated vesico-vaginal fistulas.

Text:

Aim of the video / Introduction: A vesico-vaginal fistula is an abnormal connection between the bladder and vagina. In developed countries, most vesico-vaginal fistulas occur after benign gynecologic surgery [1,2]. The incidence of vesico-vaginal fistulas after hysterectomies for benign indications in developed countries ranges from 0.22 to 0.66% [3-5]. Patients with vesico-vaginal fistulas commonly report symptoms of painless, urinary incontinence; fluid leakage per vagina; frequent urinary tract infections; and an irritated vulva due to frequent contact with urine [6-7].

Based on several studies, it may be reasonable to attempt conservative management for small, uncomplicated vesico-vaginal fistulas via insertion of a Foley catheter for several weeks [7-9]. Surgical treatment is also a primary option or can be utilized after failed conservative management. Surgical techniques include transvaginal, laparoscopic, robotic, and open with and without tissue interposition. The timing of surgical intervention is debatable and dependent on clinical circumstances. Historically, the recommendation was to wait several months prior to repair to allow for tissue healing and treatment of infection [10]. However there are several studies that support surgery as early as 2-4 weeks especially in small, non-infected, and uncomplicated fistulas [10-12]. The Latzko technique is a transvaginal, minimally invasive approach to vesico-vaginal fistula repair that involves mobilizing the vaginal mucosa around the fistula and then closing the pubovesical fascia and vaginal mucosa in layers [13,14]. Our modification to Dr. Latzko's technique is that we close the fistula with purse string sutures as opposed to interrupted, anterior to posterior sutures. It should be noted that both in the original and our modified Latzko techniques, the fistula tract is not excised but rather closed over with suture in a tension-free manner.

88

89 Method: The patient shown in the video is a 46 year old gravida four, para four status post a
90 total abdominal hysterectomy five months previously for abnormal uterine bleeding due to
91 fibroids. Her chief complaint was constant leakage of urine from her vagina since her
92 hysterectomy. She was referred to our hospital for management of her vesico-vaginal fistula.
93 Her obstetrical history was significant for four uncomplicated vaginal deliveries; medical history
94 was significant for obesity (body mass index 31.2); and past surgical history was significant for
95 an appendectomy, total abdominal hysterectomy, and bilateral salpingectomy. On genito-urinary
96 exam, the patient had a moderate amount of yellow, watery fluid in her vagina that appeared to
97 be urine. There was a small, approximately two millimeter defect surrounded by granulation
98 tissue at the vaginal cuff. Otherwise, the patient's vagina and vaginal cuff appeared normal.
99 For the patient's surgery, a transvaginal, modified Latzko technique was utilized. Cystoscopy
100 was performed and the fistula was observed to be midline, two centimeters above the trigone,
101 and at the dome of the bladder, well away from the ureters. Both ureteral orifices were noted to
102 have effluxion. A pediatric, 10-French Foley catheter was passed through the fistula from the
103 vaginal side and the balloon was inflated. Placing a Foley catheter through the fistula provides
104 better visualization of the fistula both on cystoscopy as well as vaginally and also allows the
105 surgeon to provide traction on the catheter and vaginal tissue for ease of operating. Four sutures
106 of 2-0 Monocryl on a SH-needle were placed vaginally at 12, 3, 6, and 9 o'clock around the
107 fistula to further assist in traction.

108 Using gentle traction on the Foley (and on the 2-0 Monocryl sutures if needed), the vaginal
109 epithelium around the fistula was incised with a 15-blade scalpel and dissected off of the bladder
110 epithelium using Metzenbaum scissors for about a centimeter circumferentially. The defect in

the bladder epithelium was run with a purse string suture using 2-0 Monocryl suture on a SH-needle. The Foley catheter was removed and the purse string suture tied down. A second layer of suture was placed in the bladder epithelium to invert the initial purse string suture. The vaginal epithelium was then closed with interrupted 2-0 Monocryl suture on a SH-needle. The bladder was filled with saline with no leakage into the vagina; confirming the integrity of the fistula repair.

Cystoscopy was performed again. There was no compromise of the ureters. A Foley catheter was placed. The patient was discharged home on post-operative day zero.

Results: The patient's Foley catheter was removed two weeks post-operatively and cystography was done which was normal. She was doing well at her post-operative visits and at five months post-operatively; she continues to do well without recurrence of her fistula.

Conclusion: The surgical success after a vesico-vaginal fistula repair is dependent on the size, complexity, history of previous fistula repair, duration of the fistula, and number of fistulas [15,16]. For small, uncomplicated vesico-vaginal fistulas (such as in our patient), studies have shown that a transvaginal approach has equivalent success rate as other approaches with less invasiveness and faster recovery times. The surgical success rate for vesico-vaginal fistula repair is high and ranges from 83-100% [1,2,17]. Therefore, it is reasonable to use a modified Latzko technique to help restore the quality of life to women affected by small, uncomplicated vesico-vaginal fistulas.

133 Conflict of Interest: The authors declare that they have no conflict of interest.

134 Consent: Written informed consent was obtained from the patient for publication of this video
135 article and any accompanying images.

136 References:

- 137 1. Hillary CJ, Osman NI, Hilton P, Chapple CR. The Aetiology, Treatment, and Outcome of
138 Urogenital Fistulae Managed in Well- and Low-resourced Countries: A Systematic
139 Review. Eur Uol. 2016 Sep; 70(3): 478-92.
- 140 2. Oakley SH, Brown HW, Greer JA, et al. Management of vesicovaginal fistulae: a
141 multicenter analysis from the Fellows' Pelvic Research Network. Fem Pelv Med
142 Reconstr Surg. 2014 Jan-Feb; 20(1):7-13.
- 143 3. Harkki-Siren P, Sjoberg J, Tiitinen A. Urinary tract injuries after hysterectomy. Obstet
144 Gynecol. 1998 Jul;92(1):113-8.
- 145 4. Hilton P. Trends in the aetiology of urogenital fistula: a case of 'retrogressive
146 evolution'?. Int Urogynecol J. 2016; 27:831-837.
- 147 5. Hilton P, Cromwell D. The risk of vesicovaginal and urethrovaginal fistula after
148 hysterectomy performed in the English National Health Service – a retrospective cohort
149 study examining patterns of care between 2000 and 2008. BJOG. 2012;119(12):1447–
150 1454. doi: 10.1111/j.1471-0528.2012.03474.x.
- 151 6. Vasavada SP, Schwartz BF, et al. Vesicovaginal and Ureterovaginal Fistula. Updated
152 2015 Dec 01. <http://emedicine.medscape.com/article/452934-overview#a10>.

- 153 7. Ghoniem GM, Warda HA. The management of genitourinary fistula in the third
154 millennium. Arab J Urol. 2014 Jun; 12(2):97-105.
- 155 8. Frajzyngier V, Li G, Larson E, et al. Development and comparison of prognostic scoring
156 systems for surgical closure of genitourinary fistula. Am J Obstet Gynecol. 2013
157 Feb;208(2):112.e1-112.e11.
- 158 9. Bazi T. Spontaneous closure of vesicovaginal fistulas after bladder drainage alone:
159 review of the evidence. Int Urogynecol J Pelvic Floor Dysfunct. 2007 Mar: 18(3):329-
160 33.
- 161 10. Angioli R, Penalver M, Muzli L, et al. Guidelines of how to manage vesicovaginal
162 fistula. Crit Rev Oncol Hematol. 2003 Dec;48(3):295-304.
- 163 11. Waaldijk K. The immediate surgical management of fresh obstetric fistulas with catheter
164 and/or early closure. Int J Gynaecol Obstet. 1994;45:11–16.
- 165 12. Zimmern P.E., Hadley H.R., Staskin D.R., Raz S. Genitourinary fistulae. Vaginal
166 approach for repair of vesico-vaginal fistulae. Urol Clin North Am. 1985;12:361–367.
- 167 13. Latzko W. Post operative vesicovaginal fistulas, genesis and therapy. Am J
168 Surg 1942; 58: 211–28.
- 169 14. Meeks RG, Ghafar MA. Vesicovaginal and Urethrovaginal Fistulas. Updated 2012 July.
170 https://www.glowm.com/section_view/heading/Vesicovaginal%20and%20Urethrovagina
171 [l%20Fistulas/item/64.](https://www.glowm.com/section_view/heading/Vesicovaginal%20and%20Urethrovagina)
- 172 15. Javed A, Abdullah A, Faruqi N, et al. Doctor! Will I be dry? Factors determining
173 recurrence after vesicovaginal fistula repair. J Pak Med Assoc. 2015 Sep;65(9):954-9.

- 174 16. Aved M, El Atat R, Hassine LB, et al. Prognostic factors of recurrence after
175 vesicovaginal fistula repair. Int J Urol. 2006 Apr;13(4):345-9.
- 176 17. Gedik A, Deliktas H, Celik N, et al. Which Surgical Technique Should be Preferred to
177 Repair Benign, Primary Vesicovaginal Fistulas?. Urol J. 2015 Dec 23;12(6):2422-7.