



The “Repeat Colpocleisis”: A Literature Review and Case Report

K. Marie Douglass¹ · Tajnoos Yazdany¹

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Abstract

Introduction and Hypothesis Colpocleisis is a surgical procedure intended to treat pelvic organ prolapse. Compared with other modes of pelvic reconstructive surgery, colpocleisis is associated with lower morbidity and higher satisfaction, and has a success rate of 91–100% and a reoperation rate of less than 2%. However, there is limited information on how to treat recurrent prolapse after colpocleisis.

Methods We performed a review of the existing literature regarding colpocleisis failure and retreatment. A total of 118 articles were reviewed, with 16 articles suitable for inclusion. We also describe a case from our own institution of a “repeat colpocleisis” for recurrent prolapse after previous colpocleisis.

Results “Repeat colpocleisis” was the most common surgical technique used (18 out of 24 patients, 75.0%). The median follow-up time after the repeat surgery was 12 months, with only 1 patient with recurrence reported owing to recurrent rectocele 2 years after surgery, treated successfully with perineorrhaphy. Other less common techniques included perineorrhaphy, reversal of colpocleisis with native tissue repair, and vaginal hysterectomy with vaginal repair. Our case report describes the surgical management of a patient who had previously undergone LeFort colpocleisis with recurrence of prolapse, subsequently undergoing repeat colpocleisis.

Conclusions The colpocleisis failure, though rare, presents a surgical challenge owing to both its rarity and the paucity of information in the literature regarding the optimal mode of management. In this review, the most common technique for surgical management of colpocleisis failure was repeat colpocleisis, with good short-term success rates noted. Additional studies with longer-term follow-up are needed.

Keywords Colpocleisis · Pelvic organ prolapse · Surgical outcomes

Introduction

Pelvic floor disorders (PFDs) include bothersome conditions such as pelvic organ prolapse (POP), urinary incontinence, and fecal incontinence. It is estimated that 24% of adult women have symptoms of a PFD, and the percentage of affected women increases with age [1, 2]. An estimated 11.1% of women will undergo surgery for a PFD in their lifetime [3]. With an aging population and with an increasing

proportion of elderly women compared with men, PFDs are projected to affect as many as 43.8 million women by the year 2050, and the number of women seeking treatment for a PFD is estimated to increase substantially during this time [2, 4, 5].

Surgical management of POP can involve lengthy procedures under general anesthesia, which pose increased risks to elderly women compared with younger women. With an increase in elderly women seeking treatment for POP, surgical solutions are needed that reduce the potential morbidity of these interventions. For older patients who do not desire functional vaginal anatomy and in whom limiting surgical risk is necessary, an obliterative procedure—colpocleisis—may be an appropriate choice. A total colpocleisis involves removal of most of the vaginal epithelium, creating a shortened and narrow vagina, and can be performed at the time of hysterectomy or post-hysterectomy. This eliminates certain risks, such as endometrial and cervical carcinoma,

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✉ K. Marie Douglass
KDouglass2@dhs.lacounty.gov

¹ Division of Urogynecology and Reconstructive Pelvic Surgery, Harbor-UCLA Medical Center, 1000 W Carson Avenue, Los Angeles, CA 90502, USA

whereas a hysterectomy can increase operating time and increase risk of bleeding and surgical injury [6, 7]. This technique was first described in 1823 by Geradin [6, 8]. In contrast, a partial colpocleisis (or LeFort colpocleisis) involves leaving the uterus in situ, and leaving some portion of the vaginal epithelium in place in order to provide drainage tracts for cervical or other upper genital discharge [6]. The genital hiatus is often narrowed as well in order to reduce the risk of prolapse recurrence [6]. Neugebauer performed a partial colpocleisis in 1867, although the technique was not published until 1881 [6, 9]. In 1877, LeFort published his technique, which involved two stages—first, denuding and approximating the anterior and posterior vaginal walls, followed by a perineorrhaphy performed 8 days later [6]. Since that time, several modifications have been published; however, the general technique remains the same.

Compared with other modes of pelvic reconstructive surgery, colpocleisis is associated with less morbidity, improved pelvic floor symptoms and body image, low regret, and higher satisfaction [5]. In particular, success rates have been noted to be extremely high, ranging from 91 to 100%, although typically, follow-up time does not exceed 5 years [4–6, 10, 11]. Shah et al. reported long-term follow-up of patients with colpocleisis (maximum of 14.8 years) and reported a reoperation rate of 1.4%, concluding that colpocleisis, compared with other modes of prolapse repair, “undeniably offered the most durable prolapse repair with the lowest all-cause reoperation and total retreatment rates” [12]. However, as life expectancy continues to rise and patients may be living longer after colpocleisis, will we have

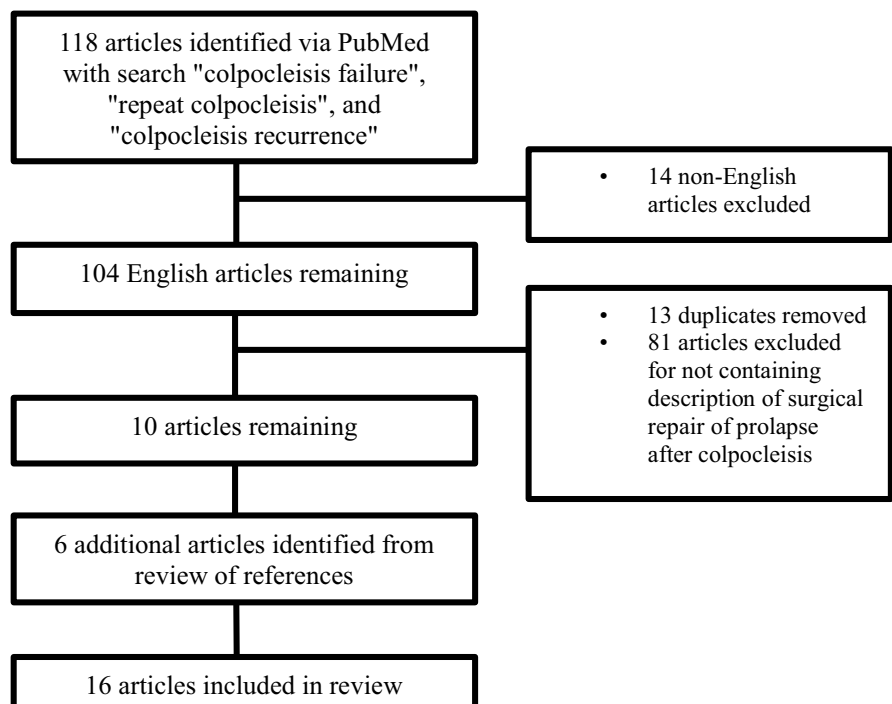
more time to see colpocleisis failures? Notably, there is very limited information on how to treat recurrent prolapse after colpocleisis apart from small case series. What follows is a review of the existing literature regarding colpocleisis failure and retreatment, followed by a case report from our own institution involving a “repeat colpocleisis.”

Materials and Methods

We performed a PubMed search for English-language articles from any time through February 2024. Search terms included “repeat colpocleisis,” “colpocleisis failure,” and “colpocleisis recurrence.” All identified papers that reported on the risk of recurrence of prolapse after colpocleisis or failure of colpocleisis, as well as papers that described surgical repair for recurrent prolapse after colpocleisis, were included. References from those papers were also reviewed in order to identify any additional relevant sources.

A total of 118 articles were identified from the search and reviewed by a single reviewer (K.M.D) for inclusion in the study. Articles that described surgical treatment of colpocleisis failure were included. Articles were excluded for the following reasons: no description of treatment of colpocleisis failure, nonsurgical management of colpocleisis failure, and language other than English. Ten articles were thus appropriate for inclusion. The references of the articles identified in the search were also reviewed, and 6 additional articles were identified that were appropriate for inclusion. In total, 16 articles were included in the review (Fig. 1).

Fig. 1 Flowchart of the inclusion of articles in this study



Results

Table 1 shows the complete data set, whereas Table 2 shows a summary analysis of the outcome of this review. “Repeat colpocleisis,” described below, was the most common surgical technique used (18 out of 24 patients, 75.0%), with other techniques less common: perineorrhaphy (2 out of 24 patients, 8.3%), reversal of colpocleisis

with native tissue repair (1 out of 24, 4.2%), and vaginal hysterectomy with vaginal repair (3 out of 24, 12.5%).

Summary of patient and case demographics is limited by incomplete information in many of the papers. For those cases that did contain complete information, the majority of patients (13 out of 15, 86.7%) had undergone a LeFort colpocleisis, with the remainder undergoing complete colpocleisis (2 out of 15, 13.33%). The average patient age was

Table 1 Cases of surgical management in patients with colpocleisis failure

Technique	Reference	Number of cases	Age (mean)	Initial surgery	Time since initial surgery, months, median (range)	Prolapse stage at evaluation, median (range)	Follow-up, months, median (range)	Recurrence
Repeat colpocleisis	Mazer et al. [13]	1	68	LeFort	Within 12 months	NA	NA	NA
	Hanson and Keettel [9]	3	NA	LeFort	NA	NA	NA	1 (patient developed rectocele 2 years later, treated via perineorrhaphy)
	Ridley [14]	2	NA	LeFort	6 (2–8)	NA	NA	NA
	Kohli et al. [15]	1	92	LeFort	8	Beyond the hymen	NA	NA
	DeLancey and Morley [16]	1	NA	Complete	12	NA	12	No
	Roth [17]	1	78	LeFort	36	3	6	No
	Reisenauer and Wallwiener [18]	1	89	LeFort	NA	4	60	No
	Hoskey et al. [19]	1	85	LeFort	5	3	12	No
	Zebede et al., [20]	4	NA	LeFort	NA	2 (2–4)	NA	NA
	Gungor Ugurlucan et al. [21]	1	68	LeFort	3	4	12	No
Perineorrhaphy and posterior colporrhaphy	Mikos et al. [7]	1	77	LeFort	6	NA	6	No
	Martan et al. [22]	1	60	LeFort	12	2	2	No
Reversal of colpocleisis and native tissue repair	Hanson and Keettel [9]	1	NA	LeFort	24	NA	NA	NA
	Winkelman et al. [4]	1	NA	NA	Within 12 months	3	NA	NA
Vaginal hysterectomy with colporrhaphy	Doumouchtsis et al. [23]	1	81	Complete	6	3	NA	NA
	Ubachs et al. [24]	2	NA	LeFort	Both within 1–2 months	NA	NA	NA
	Vij et al. [25]	1	NA	NA	Within 12 months	NA	NA	NA

Time is listed in months and represented as median and range, with no range listed for studies with single participants

Prolapse stage is indicated using the Pelvic Organ Prolapse Quantification system

NA not available

Table 2 Summary of surgical management of colpopcleisis failure

Surgical method	Number of patients	Time to recurrence since prior surgery, months (median (range))	Follow-up after surgery, months (median (range))
Repeat colpopcleisis	18	8 (2–36)	12 (2–60)
Perineorrhaphy and posterior colporrhaphy	2	18 (12–24)	NA
Reversal of colpopcleisis and native tissue repair	1	6	NA
Vaginal hysterectomy with colporrhaphy	3	1.5 (1.5–12)	NA

Time is listed in months and represented as median and range, with no range listed for studies with single participants

NA not available

77.6 years, and median time to recurrence was 8 months (range 1.5–36). The median prolapse stage at recurrence was 3 (range 2–4). Of note, one author reported failure of colpopcleisis owing to the development of pyometra (Roth), whereas three patients (3 out of 24, 12.5%) were noted to have repeat prolapse through a vaginal channel after LeFort colpopcleisis [7, 17, 19, 21]. The median follow-up time after the repeat surgery was 12 months (range 2–60), with only 1 recurrence reported due to recurrent rectocele 2 years after surgery, which was treated successfully with perineorrhaphy (Table 1) [9].

Regarding repair technique, “repeat colpopcleisis” was described in 12 papers (18 out of 24 patients, 75.0%) [7, 9, 13–22]. The mean patient age was 77.1, and the median stage of prolapse at presentation was 3 (range 2–4). The techniques for “repeat colpopcleisis” described in the literature vary. Roth describes first performing a total abdominal hysterectomy, bilateral salpingo-oophorectomy, upper vaginectomy, and the Halban culdoplasty, followed by a “total colpopcleisis and vaginectomy with high levator plication” [17]. Reisenauer and Wallwiener describe making a circumscripting incision through the vaginal mucosa, performing a colpectomy, and affixing the anterior and posterior vaginal walls using nonresorbable sutures, in addition to performing levator myorrhaphy and perineorrhaphy [18]. Hoskey et al., Mikos et al., and Gungor Ugurlucan et al. all describe a technique of repair after prolapse through a vaginal channel, in which the vaginal epithelium of this prolapsing tissue is excised as with a colpectomy, and purse-string sutures are used to obliterate the vaginal channel and reduce the prolapse. Posterior colporrhaphy and perineorrhaphy are then performed [7, 19, 21]. Finally, Martan et al. describe first performing a laparoscopic-assisted vaginal hysterectomy, followed by “placement of four 2–0 Vicryl resorbable stitches in the scar” in order to separate the anterior and posterior vaginal walls. A perineal skin flap, measuring 3.5 × 4 cm, was then created, and, via a tunnel, this flap was affixed to the “frail posterior vaginal wall as prevention of the formation of enterocele.” Resorbable sutures were then used to “suture the posterior vaginal wall with the lateral edges of the skin flap and the anterior vaginal wall, creating lateral

channels,” followed by “a modification of Labhardt’s high perineoplasty” [22]. The remaining authors did not describe a definitive technique apart from “repeat colpopcleisis” or “total vaginal closure” [9, 13–16, 20], although a vaginal approach is presumed. The median follow-up time after these surgeries was 12 months (range 2–60). As noted above, one recurrence was noted owing to repeat rectocele, which was treated surgically via perineorrhaphy (Table 2) [9].

The technique of perineorrhaphy and posterior colporrhaphy was described in two papers (2 out of 24 patients, 8.3%) [4, 9]. Patient ages were not reported. Stage of prolapse at presentation (stage 3) was reported for one patient. Definitive techniques were not described, apart from Winkelman et al., who reported performing “a more extensive posterior repair and perineorrhaphy” [4]. Neither follow-up time nor recurrences were reported (Table 2).

The technique of “reversal of colpopcleisis” with native-tissue repair was described in one paper (1 out of 24 patients, 4.2%) [23]. The patient’s age was 81 years, and the stage of prolapse at presentation was 3. Doumouchtsis et al. describe identifying a dissection plane by passing a finger through a vaginal channel to identify the vaginal apex, with a separate rectal finger used to ensure a safe plane of entry. The anterior and posterior vaginal walls were then separated, and epithelial defects were closed. Four months after this surgery, the patient subsequently underwent sacrospinous ligament fixation, anterior colporrhaphy, and perineorrhaphy [23]. Neither the follow-up time nor recurrence was reported (Table 2).

The technique of vaginal hysterectomy with colporrhaphy was described in two papers (3 out of 24 patients, 12.5%) [24, 25]. Neither the mean patient age nor the stage of prolapse at presentation was reported. The techniques are not well described; Ubachs et al. report that the patient underwent “vaginal hysterectomy with high posterior wall plasty,” whereas Vij et al. note that a “vaginal hysterectomy with anterior and posterior repair” was performed [24, 25]. Neither follow-up time nor recurrence rate was reported (Table 2).

At our institution, we report on the experience of performing a repeat colpopcleisis. Patient FC was a

75-year-old with symptomatic stage IV prolapse managed via pessary, requesting definitive surgical management. She also had bothersome stress incontinence. She underwent an uncomplicated LeFort colpocleisis, perineorrhaphy, and midurethral sling. Her postoperative course was complicated by a superficial skin infection at one of the sling trocar exit sites, which was treated successfully with antibiotics. She also reported significant postoperative constipation, which was managed medically. At 2 months postoperatively, she reported recurrent bulge symptoms and was noted to have descent of the anterior vaginal wall to the hymen. She was initially managed conservatively, but her symptoms worsened, her anterior vaginal wall prolapse progressed to +3, and she requested repeat surgical management. Two years and 3 months after her initial surgery, she underwent repeat colpocleisis; the vaginal apex was not opened, but rectangular sections of the vaginal epithelium were removed anteriorly and posteriorly, and the mucosa affixed using interrupted delayed-absorbable sutures. Repeat perineorrhaphy was also performed (Fig. 2). She had an uncomplicated postoperative course, and at 14 months after surgery she continued to report symptomatic improvement, denied any bulge symptoms, and had no evidence of prolapse recurrence on examination.

Discussion

The colpocleisis operation offers a low-risk, durable surgical repair for patients with bothersome prolapse symptoms who do not desire to retain the ability for penetrative vaginal intercourse. Success rates are reported to be high and reoperation rates low [4–6, 10–12]. Colpocleisis failure, although rare, presents a surgical challenge owing to both its rarity

and the paucity of information in the literature regarding the best mode of management.

This article is aimed at providing a comprehensive review of the surgical management of colpocleisis failure. The review demonstrated four methods of surgical repair: repeat colpocleisis, perineorrhaphy with posterior colporrhaphy, reversal of colpocleisis with native tissue repair, and vaginal hysterectomy with colporrhaphy. From this review, the repeat colpocleisis appears to be the most common approach (75%), although the techniques described differ significantly. Positive outcomes have been reported after short-term follow-up (median 12 months). In our institution, a colpocleisis failure was similarly managed by again removing anterior and posterior sections of the vaginal epithelium and reapproximating the mucosa, as with a traditional colpocleisis, with good short-term (14-month) results.

Limitations of this review include a possible lack of generalizability given the scarcity of literature on the surgical management of colpocleisis failure. In addition, long-term information on the durability of these surgical repairs is limited, and it remains to be seen if with time and an aging population success rates will decline. PubMed was the only database utilized in this review as it had the most relevant articles available, and screening and data abstraction were performed by a single reviewer. Furthermore, no quality assessment of included studies was performed, and only articles in English were included in the review. Although the review was comprehensive, including article references to yield additional results, some articles may have been inadvertently excluded.

Despite these limitations, this study addresses the rare but challenging clinical question of how to address recurrent prolapse after colpocleisis failure. Additional studies with longer-term follow-up are needed to ensure the durability of the repair.

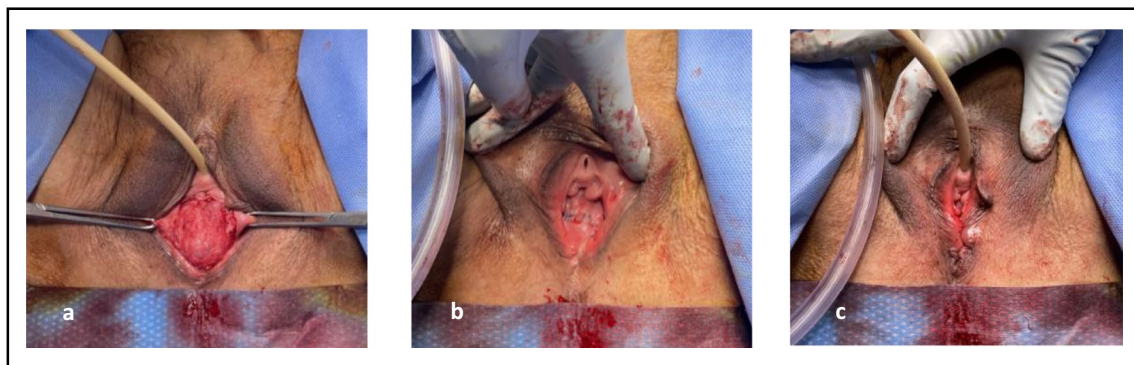


Fig. 2 Photographs from our patient's repeat colpocleisis. **a** Intraoperative photograph under anesthesia showing anterior vaginal wall prolapse after removal of the vaginal epithelium. **b** Anterior and

posterior vaginal walls were plicated to reduce the prolapse, and the edges of the vaginal epithelium were re-approximated. **c** End of the case after repeat perineorrhaphy

Authors' Contributions K.M.D.: project development, data collection, data analysis, manuscript writing/editing; T.Y.: project development, manuscript writing/editing.

Declarations

Informed Consent The patient in this case report gave written consent to inclusion.

Conflicts of Interest None.

References

- Serdinšek T. How to train a future urogynecologist. *Int Urogynecol J.* 2022;33:1–2.
- Wu JM, Hundley AF, Fulton RG, et al. Forecasting the prevalence of pelvic floor disorders in U.S. women: 2010 to 2050. *Obstet Gynecol.* 2009;14(6):1278–83.
- Olsen AL, Smith VJ, Bergstrom JO, et al. Epidemiology of surgically managed pelvic organ prolapse and urinary incontinence. *Obstet Gynecol.* 1997;89:501–6.
- Winkelman WD, Haviland MJ, Elkadry EA. Long-term pelvic floor symptoms, recurrence, satisfaction, and regret following colpopoiesis. *Female Pelvic Med Reconstr Surg.* 2020;26(9):558–62.
- Lu M, Zeng W, Ju R, et al. Long-term clinical outcomes, recurrence, satisfaction, and regret after total colpopoiesis with concomitant vaginal hysterectomy: a retrospective single-center study. *Female Pelvic Med Reconstr Surg.* 2021;27(4):510–5.
- FitzGerald MP, Richter HE, Siddique S, et al. Colpopoiesis: a review. *Int Urogynecol J Pelvic Floor Dysfunct.* 2006;17(3):261–71.
- Mikos T, Chatzipanteli M, Grimbizis GF, et al. Enlightening the mechanisms of POP recurrence after LeFort colpopoiesis: case report and review. *Int Urogynecol J.* 2017;28(7):971–8.
- Falk HC, Kaufman SA. Partial colpopoiesis: the Le Fort procedure; analysis of 100 cases. *Obstet Gynecol.* 1955;5(5):617–27.
- Hanson GE, Keettel WC. The Neugebauer-Le Fort operation. A review of 288 colpopoieses. *Obstet Gynecol.* 1969;34(3):352–7.
- Song X, Zhu L, Ding J, et al. Long-term follow-up after LeFort colpopoiesis: patient satisfaction, regret rate, and pelvic symptoms. *Menopause.* 2016;23(6):621–5.
- Wang YT, Zhang K, Wang HF, et al. Long-term efficacy and patient satisfaction of Le Fort colpopoiesis for the treatment of severe pelvic organ prolapse. *Int Urogynecol J.* 2021;32(4):879–84.
- Shah NM, Berger AA, Zhuang Z, et al. Long-term reoperation risk after apical prolapse repair in female pelvic reconstructive surgery. *Am J Obstet Gynecol.* 2022;227(2):306.e1–16.
- Mazer C, Leon Israel S. The Le Fort colpopoiesis: an analysis of 43 operations. *Am J Obstet Gynecol.* 1948;56(5):944–9.
- Ridley JH. Evaluation of the colpopoiesis operation: a report of fifty-eight cases. *Am J Obstet Gynecol.* 1972;113(8):1114–9.
- Kohli N, Sze E, Karram M. Pyometra following Le Fort colpopoiesis. *Int Urogynecol J Pelvic Floor Dysfunct.* 1996;7(5):264–6.
- DeLancey JO, Morley GW. Total colpopoiesis for vaginal eversion. *Am J Obstet Gynecol.* 1997;176(6):1228–32.
- Roth TM. Pyometra and recurrent prolapse after Le Fort colpopoiesis. *Int Urogynecol J Pelvic Floor Dysfunct.* 2007;18(6):687–8.
- Reisenauer C, Wallwiener D. Treatment of recurrent vaginal eversion after previous Le Fort colpopoiesis. *Int J Gynaecol Obstet.* 2011;114(2):161–2.
- Hoskey KA, Shippey SH, Handa VL. Surgical repair of recurrent prolapse after LeFort colpopoiesis. *Int Urogynecol J.* 2012;23(3):371–3.
- Zebede S, Smith AL, Plowright LN, et al. Obliterative LeFort colpopoiesis in a large group of elderly women. *Obstet Gynecol.* 2013;121:279–84.
- Gungor Ugurlucan F, Can IS, Yalcin O. Surgical treatment of recurrent prolapse after Le Fort partial colpopoiesis. *Eur J Obstet Gynecol Reprod Biol.* 2014;173:121–2.
- Martan A, Svabik K, Masata J, et al. Colpopoiesis with a skin flap. *Int Urogynecol J.* 2020;31(6):1273–6.
- Doumouchtsis SK, Rada MP, Walker RMH, et al. Reversal of colpopoiesis—a surgical technique for recurrent pelvic organ prolapse. *J Obstet Gynaecol Res.* 2022;48(1):275–9.
- Ubachs JMH, Van Sante THJ, Schellekens LA. Partial colpopoiesis by a modification of LeFort's operation. *Obstet Gynecol.* 1973;42(3):415–20.
- Vij M, Bombieri L, Dua A, et al. Long-term follow-up after colpopoiesis: regret, bowel, and bladder function. *Int Urogynecol J.* 2014;25(6):811–5.

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