


How does colpocleisis for pelvic organ prolapse in older women affect quality of life, body image, and sexuality? A critical review of the literature

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Abstract

Colpocleisis is a surgical treatment for pelvic organ prolapse that results in vaginal obliteration. This review aims to systematically evaluate the quality of life, changes in body image, regret, and impact on sexual activity in women after colpocleisis. A review was conducted using the PubMed and Scopus databases with search criteria specifying pelvic organ prolapse, colpocleisis, quality of life, body image, regret, sexuality, and their synonyms. For the selection of the eligible articles, we used the PRISMA reporting system. A total of 1285 articles were found. After removing duplicates and applying the inclusion and exclusion criteria, 30 articles were reviewed in full length. Quality of life after colpocleisis was evaluated in 22 articles, and 20 authors used validated questionnaires. All concluded that quality of life improved after surgical treatment. Twenty-one articles studied regret after obliterative treatment for pelvic organ prolapse. Most of the patients reported no regret. Regret was often due to bowel and bladder symptoms. A few patients reported regret because of loss of coital function. Body image was highlighted in six studies. Three articles assessed body image using the modified Body Image scale. The body image scores demonstrated a significant improvement after surgery. Women tended to remain sexually active and some also regained sexual activities after surgery. Colpocleisis remains a viable option for pelvic organ prolapse, without compromising quality of life, body image, or sexuality, but diligent patient selection is needed. Particular concern should be given to bladder and bowel symptoms since these are the main reason for dissatisfaction after colpocleisis.

Keywords

body image, colectomy, colpocleisis, pelvic organ prolapse, quality of life, regret, sexuality

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Introduction

Pelvic organ prolapse (POP) is the downward descent of pelvic organs including the bladder, rectum, and uterus together with the anterior and posterior vaginal wall, sometimes with the inclusion of small intestine.¹ The causes of POP seem to be multifactorial and vary between different individuals. Established risk factors are vaginal delivery, increasing body mass index, and advancing age. Other potential risk factors that have been associated with urogenital prolapse include most notably young age at first delivery, forceps delivery, high infant birth weight, prolonged second stage of labor, constipation, connective tissue disorder, previous hysterectomy, and ethnic origin.²

According to a study on postmenopausal women by the Women Health's Initiative, the prevalence is around 40%, and due to the aging of the population globally, the prevalence is likely to increase.³ POP causes various bothersome pelvic floor symptoms, including a sensation of

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bulge or protrusion, as well as pain and discomfort in the lower abdomen and buttocks, and is often combined with urinary incontinence, urinary retention, urinary tract infections, and obstructive defecation.² Thus, women who suffer from POP often report a great impact on their quality of life (QOL) but also impairment in the patients' perception of their sexual attractiveness and body image.⁴

The choice of treatment depends on the severity of prolapse and symptoms along with the patient's health and activity. Current management includes observation, pelvic floor muscle training, pessary use, and surgery.¹ In general, surgical treatment for prolapse can be categorized into reconstructive and obliterative procedures. Reconstructive surgery aims to restore the anatomy and function of the vagina and, consecutively, the pelvic organs.^{5,6}

Obliterative treatment, such as colpocleisis, aims to the closing of the vaginal canal, thus preventing the prolapse. It was first described in the 19th century and is mainly reserved for frail or elderly women with medical comorbidities who no longer desire sexual intercourse.⁷ Published studies have shown that obliterative procedures, when compared with reconstructive procedures, have shorter operative times, lower blood loss, less morbidity, and quicker recovery.⁸ The anatomical success rate is reported to be as high as 98% and satisfaction rate up to 92%.⁹

However, there are considerations that, although the anatomical success rates are high, such an obliterative and irreversible surgical procedure could in fact have a negative impact on the patients' QOL, regarding their body image, sexual functionality, and also cause regret.⁴ To our knowledge, most of the original published studies and reviews focus on anatomical success, and it still remains unclear to what extent colpocleisis affects the aforementioned aspects of a woman's health.

The aim of this systematic review is to identify and present published data that examine the impact of colpocleisis on the patients' QOL, sexual activity, regret, and body image.

Research strategies

A literature search in the PubMed and Scopus databases was conducted. No time limit was set for the publication date. The keywords used were "pelvic organ prolapse," "colpocleisis," "colpectomy," "quality of life," "body image," and "regret." All articles published in English, French, German, or Italian were included in this review. We included prospectively and retrospectively designed trials and we excluded previous review articles. For the selection of the eligible articles, we used the PRISMA reporting system.¹⁰

A total of 1286 articles were retrieved from the search. After removing duplicates and applying the inclusion and exclusion criteria, 31 articles were reviewed in full length.

The workflow of the article selection can be seen in detail on the PRISMA diagram (Figure 1). The studies were performed in the United States (n=14), Asia (n=8), Europe (n=5), and the Middle East (n=4). The articles were mainly written in English (n=29), and two in French. Regarding the study design, most of the articles were retrospective (n=22) trials, seven were prospective, one was an ambidirectional study, and one longitudinal. There were no comparative trials found, so the review was written in a narrative manner. There was no funding for the completion of this research article.

Quality of life

Twenty-two articles assessed the QOL of patients after colpocleisis. Twenty authors used validated QOL questionnaires, one article used a visual analog scale, and one formulated a specific question to retrieve the patients' perspective. Results are summarized in Table 1.

The most frequently used questionnaire to measure condition-specific QOL after colpocleisis (n=8) is the *Pelvic Floor Distress Inventory Questionnaire-20* (PFDI-20), which is the short version of the *Pelvic Floor Distress inventory* (PFDI) and was developed by Barber et al.¹¹ in 2005. The PFDI-20 consists of 20 items and is divided into three subscales as follows: Pelvic Organ Prolapse Distress Inventory (POPDI-6), Colorectal-Anal Distress Inventory (CRADI-8), and Urinary Distress Inventory (UDI-6). Total scores for each subscale range from 0 to 100 with higher scores representing a greater degree of distress or bother.

Six authors compared the PFDI-20 from before surgery with postoperation time. In those six studies, the PFDI-20 scores significantly improved after colpocleisis.¹²⁻¹⁷

Winkelman et al.¹⁸ asked the subjects to complete the PFDI-20 questionnaire after a median follow-up time of 6 years. 23 patients (n=31, 71.9%) indicated symptoms on the PFDI-20, those with symptoms had a median score of 37.5 with a maximum score of 110.4.

Three authors used the UDI-6, one of the subscales of the PFDI-20, and the *Incontinence Impact Questionnaire* (IIQ-7) to assess QOL and symptom distress for urinary incontinence in women before and after colpocleisis.¹⁹ In those studies, the mean UDI-6 and IIQ-7 scores improved significantly from baseline.²⁰⁻²²

The PFDI, the long form of the PFDI-20, is a six-item symptom inventory with three subscales: POPDI, UDI, and CRADI. The *Pelvic Floor Impact Questionnaire* (PFIQ) consists of 93 items and has three subscales: Urinary Impact Questionnaire (UIQ), Pelvic Organ Prolapse Impact Questionnaire (POPIQ), and Colorectal-Anal Impact Questionnaire (CAIQ).²³ To decrease administration length, a short form of the PFIQ with seven items has been developed (PFIQ-7). Lower scores in the PFDI and the PFIQ indicate less bother and a better QOL.¹¹ FitzGerald et al. compared the PFDI and PFIQ subscales before obliterative

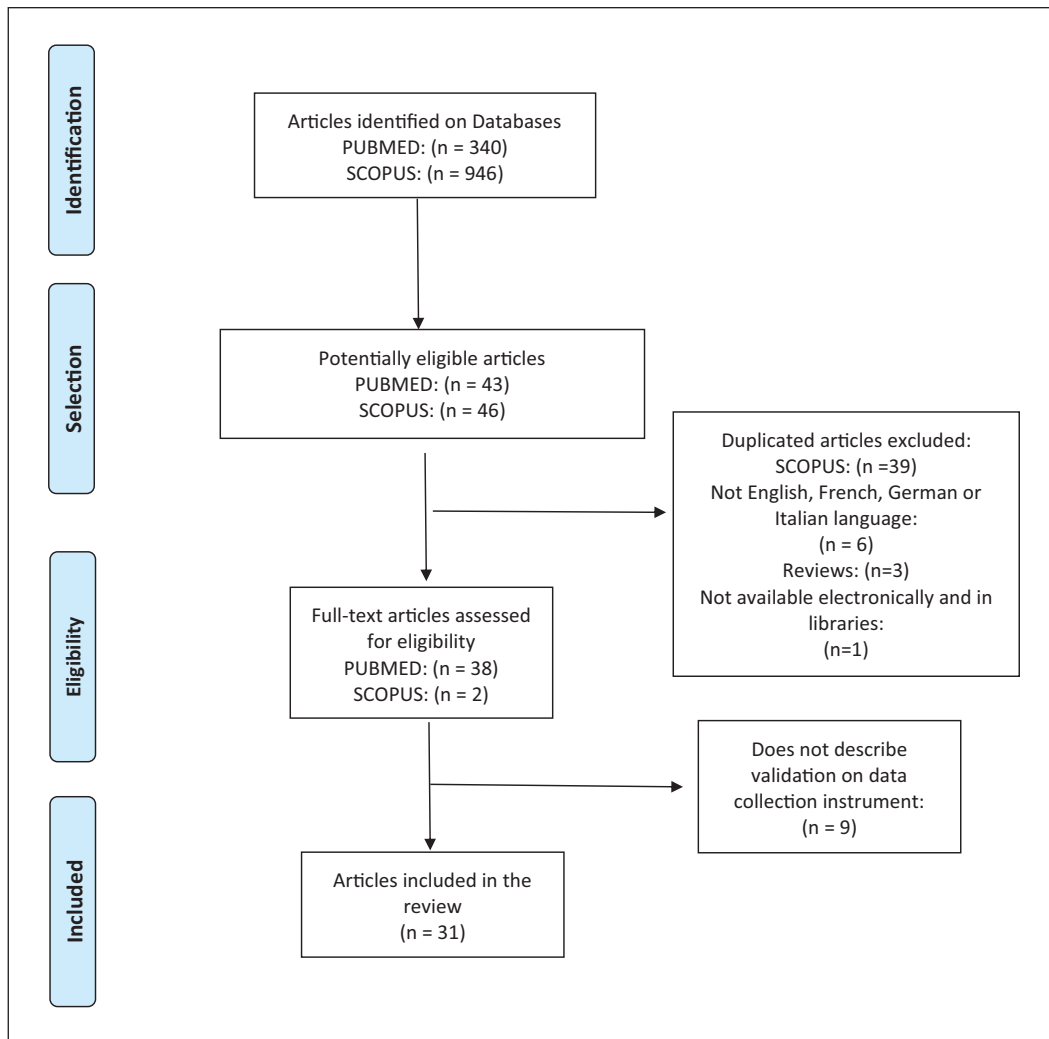


Figure 1. PRISMA diagram in identifying the literature.

Source: Moher et al.¹⁰

For more information, visit www.prisma-statement.org

treatment (n=152), 3 months (n=141), and 12 months (n=132) after surgery. The age range of the patients was 65–94 years. After surgery, all PFDI and PFIQ subscales significantly improved compared to the baseline.²⁴ Barber et al. had similar results with a significant improvement of the PFDI and PFIQ subscales 6 and 12 months after col-pocleisis (n=30, mean age 77.8 ± 5 years).²⁴

Two authors used the CRADI questionnaire, one of the subscales of the PFDI, to evaluate the presence of bowel symptoms and related burden. The CRADI questionnaire contains 16 questions and has four subscales. The composite score is the sum of the four subscale scores and ranges from 0 to 400, with higher scores indicating more severe functional impairment. Gutman et al.²⁵ showed significantly lower composite scores 12 months after obliterative treatment. Vij et al.²⁶ showed low scores on the CRADI questionnaire indicating a lower degree of bother from bowel symptoms. Gutman et al. had similar results using

additionally the CRAIQ questionnaire, a subscale of the PFIQ.

Vij et al. also asked the participants to complete the *International Consultation on Incontinence Questionnaire Short Form (ICIQ-SF)*.²⁷ The low score on the ICIQ-SF suggests a positive impact on bladder function.

Neimark et al.⁷ used a two-part validated questionnaire developed by Kobashi et al.²⁸ to assess QOL impact 12 weeks postoperatively. It consists of 15 items. The maximum score is 75, and the lowest score is 15. The higher the score, the greater the impact on the QOL. Thirty-seven of 45 patients returned the questionnaires (82 %). The mean total score for all patients was $24.8 (\pm 8.6)$ (range, 15–49). The mean total score for patients with postoperative bowel and bladder symptoms was $25.8 (\pm 9.1)$, and the score for patients without symptoms was $21.4 (\pm 6.0)$. The difference between these two groups was not significant ($p=0.11$).

Table 1. Questionnaires for the assessment of QOL after colpocleisis.

Reference	Year	Author	Number of patients	Median age (years)	Follow-up	Score Presurgery	Score Postsurgery	p
PFDI-20 Pelvic Floor Distress Inventory-20, 20 items, 3 subscales: Pelvic Organ Prolapse Distress Inventory (POPDI-6), Colorectal-Anal Distress Inventory (CRADI-8), Urinary Distress Inventory (UDI-6). The sum of the three scales is the summary of the PFDI-20 and ranges from 0 to 300. Low scores indicate a good of QOL.								
1	2020	Wang et al.	26	71.8 ± 7.3	33.077 ± 18.436 months	53.850 ± 17.948	19.115 ± 7.726	<0.001
2	2021	Lu et al.	Total colpocleisis with hysterectomy (CH): 172 LeFort: 70	CH: 76.0 (±4.9) LeFort: 76.7 (±5.4)	CH: 43.0 months (19.0–85.0) LeFort: 45.0 months (26.0–79.0)	CH: 86.1 ± 39.3 LeFort: 89.8 ± 33.4	CH: 24.0 ± 22.4 LeFort: 10.6 ± 12.7	<0.001 <0.001
3	2020	Winkelmann et al.	32	77.3 (70.2–82.9)	6 (6.0–8.5) months	–	37.5 (18.8–54.2)	–
4	2016	Crisp et al.	61	78.8 ± 6.1	24 weeks	98.4 (66.7–161.4)	29.2 (7.3–66.7)	<0.001
5	2017	Wang et al.	278	72.4 ± 7	3 (1.5–5) years	67.5 ± 23.1	23.8 ± 15.0	<0.001
6	2016	Song et al.	35	75.4 ± 4.7	5 (3–7) years	60.5 ± 29.5	14.1 ± 20.0	<0.001
7	2013	Crisp et al.	87	79.4 ± 5.83	6 weeks	121.3 (80.3–167.2) (n=78)	33.8 (12.5–72.9) (n=78)	<0.001
P-QOL Prolapse Quality of Life Questionnaire. GHP: general health perception; PI: prolapse impact; RL: role Limitations; PL: physical limitations; PR: personal relationships; EM: emotions; SE: sleep/energy; SM: severity measures; GS: general score.								
1	2021	Ertas et al.	53	73 ± 7.1	30.8 ± 15.7 months	GHP: 54 ± 10 PI: 56 ± 12 RL: 53 ± 16 PL: 47 ± 8 SL: 46 ± 10 PR: 20 ± 1 EM: 6 ± 1 SE: 28 ± 10 SM: 77 ± 10 GS: 51 ± 15	GHP: 28 ± 9 PI: 27 ± 9 RL: 26 ± 8 PL: 23 ± 9 SL: 22 ± 5 PR: 20 ± 3 EM: 21 ± 4 SE: 23 ± 7 SM: 21 ± 3 GS: 52 ± 5	<0.001 <0.001 <0.001 <0.001 <0.001 0.102 <0.001 <0.001 <0.001 <0.001
2	2018	Petcharopas et al.	93	69.04 ± 8.03	23.87 months	–	GHP: 25 (0–50) PI: 1.75 (1.75–36.84) RL: 0 (0–33.33) PL 0 (0–33.33) SL: 0 (0–33.33) PR: 0 (0–0) EM (0– 33.33) SE: 0 (0–33.33) SM: (0–16.67)	–
3	2014	Vij et al.	23	78.68 (75–91)	24–68 months	8 (0–37) ± 9.41	GHP: 0.8 ± 0.7 PI: 3.6 ± 3.2 RL: 0.2 ± 0.4 PL: 0.1 ± 0.3 SL: 0.2 ± 0.6 PR: 0.2 ± 0.6 EM: 0.0 ± 0.0 SE: 0.0 ± 0.0 SM: 0.0 ± 0.0 GS: 5.1 ± 4.9	– 0.005 0.005 0.005 0.005 0.011 0.012 0.004 0.007 0.005 0.005
4	2012	Yeniel et al.	10	74.9 ± 4.5	6 months	GHP: 5.0 ± 0.8 PI: 28.2 ± 11.4 RL: 3.8 ± 1.6 PL: 4.3 ± 1.3 SL: 3.2 ± 2.2 EM: 5.7 ± 2.4 SE: 2.7 ± 1.3 SM: 5.9 ± 1.9 GS: 62.3 ± 17	–	0.005 0.005 0.005 0.005 0.011 0.012 0.004 0.007 0.005 0.005

(continued)

Table 1. (Continued)

Reference	Year	Author	Number of patients	Median age (years)	Follow-up	Score Presurgery	Score Postsurgery	p
SF-36		Short Form Health 36. Physical, range 0–100, higher score implies better QOL						
1	2008	FitzGerald et al.	152	79.3 ± 5.6	12 months	42 ± 9	44.3 ± 15.7 (n = 132) + 1.1	<0.015
2	2006	Barber et al.	30	77.8 ± 5	12 months	37 ± 11		n.s.
CRAIQ		Colorectal-Anal Impact Questionnaire. Subscale of the PFIQ. Measures impact of bowel symptoms on 31 activities of daily living. Scores range from 0 to 400. Lower scores indicate less functional impairment and better QOL.						
1	2010	Gutman et al.	121	79.2 ± 5.4	12 months	10.6 (0–34.7)	0 (0–7.7)	<0.01
CRADI		Colorectal anal distress inventory. Subscale of the PFDI. Contains 16 questions evaluating bowel symptoms and related bothers. Four subscales: obstructive, incontinence, pain/irritation, rectal prolapse. Subscale scores range from 0 to 100, the sum of the four subscale scores ranges from 0 to 400. Lower scores indicate less bother and better QOL.						
1	2014	Vij et al.	23	78.68 (75–91)	24–68 months	–	10 (0–28) ± 8.13	–
2	2010	Gutman et al.	121	79.2 ± 5.4	12 months	55.2 (25.7–101.4)	21.1 (3.6–66.1)	<0.01
UDI-6		Urinary-Distress-Inventory-6, part of the PFDI-20						
1	2012	Asoğlu et al.	27	72.85 ± 6.12	27.5 ± 13.7 months	Irritative 1.70 ± 1.49 Stress 1.65 ± 1.78 Obstructive 2.85 ± 1.95	Irritative 1.65 ± 1.42 Stress 0.95 ± 1.54 Obstructive 0.35 ± 0.59	Irritative: 0.914 Stress 0.192 Obstructive: 0.000
2	2007	Hullfish et al.	40	75.4 ± 6.8	2.75 ± 1.90 years	39.9 ± 24.9	21.0 ± 20.3	<0.01
3	2005	Wheeler et al.	32	81.4 ± 5.1	27.5 ± 13.7 months	63.1 ± 24.3 (n = 28)	24.2 ± 26.7 (n = 28)	1
IIQ-7		Incontinence Impact Questionnaire, short form. Lower scores imply better QOL.						
1	2012	Asoğlu et al.	27	72.85 ± 6.12	27.5 ± 13.7 months	15.05 ± 2.21	2.50 ± 3.69	0
2	2007	Hullfish et al.	40	75.4 ± 6.8	2.75 ± 1.90 years	35.4 ± 29.3	17.3 ± 24.6	0.01
3	2005	Wheeler et al.	32	81.4 ± 5.1	27.5 ± 13.7 months	40.9 ± 31.7 (n = 28)	14.1 ± 26.7 (n = 28)	3
Kobashi		Two-part validated questionnaire consisting of 15 items. Maximum score: 75. Lowest score: 15. The higher the score, the greater the impact on QOL						
1	2003	Neimark et al.	45	83 ± 5.2 (71–94)	12 weeks	24.8 ± 8.6 (15–49) (n = 37, 82%)	21.4 ± 6.0	0.11

Table 2. Body Image score (BIS) for the assessment of body image pre- and postoperatively.

Year	Author	Number of patients	Mean age at time of surgery (years)	Follow-up time	BIS preoperatively	BIS postoperatively	<i>p</i>
2017	Wang et al.	334	72.4 (± 7) (n=278)	3 years (1.5–5)	Mean: 0.088 (± 0.155) total: 0.708 (± 1.239)	Mean: 0.056 (± 0.101) total: 0.446 (± 0.812)	<0.001
2016	Crisp et al.	90	78.8 (± 6.1)	24 weeks	Mean: 0.12 (0–0.6) total: 1 (0–4.8)	Mean: 0 (0–0.2) total: 0 (0–2.0)	<0.001
2013	Crisp et al.	87	79.4 (± 5.83)	6 weeks	Mean: 0.25 (0–1.03) total: 2 (0–8.25)	Mean: 0 (0–0.25) total: 0 (0–2.0)	<0.001

Barber et al.⁶ and FitzGerald et al.²⁴ both used the *Short-Form-36* (SF-36) generic health-related QOL questionnaire,²⁹ including a physical and a mental part that each ranges from 0 to 100, higher scores imply better QOL.

Four authors used the *Prolapse QOL* (P-QOL) questionnaire to evaluate the impact of pelvic floor dysfunction.³⁰ This questionnaire contains nine items, a four-point scoring system for each item and a total score for each domain ranging from 0 to 100. A low total score indicates a good QOL. Yeniel et al. asked the patients to complete the P-QOL questionnaire before colpopoiesis, 6 weeks and 6 months after the surgery. Compared to the baseline, the 6 weeks and 6 months scores of QOL improved significantly. Except for the general and prolapse impact score, none of the QOL scores changed significantly within the postoperative period.³¹ Petcharopas et al. compared, in a retrospective cohort study, QOL in women after obliterative treatment to women after reconstructive surgery (mean follow-up time 23.87 months). Results are shown for the obliterative group. The obliterative surgery resulted in a positive impact on all domains of the P-QOL.³² Vij et al.²⁶ showed 24–68 months after the obliterative treatment low scores on the P-QOL, signifying a good QOL. Ertas et al. asked 53 patients to complete the P-QOL questionnaire before colpopoiesis and 12–82 months after the surgery. The mean age at operation was 73 (± 7.1) years. Analyses of the P-QOL questionnaires showed a statistically decrease in the postoperative P-QOL score ($p < 0.001$). The subcategory “personal relationships” measures QOL in terms of sexual experiences. The patients in this study were sexually inactive. As expected, there was no significant change in this subcategory.³³

Katsara et al. contacted patients by telephone after a mean follow-up time of 41 months (10–120). Median age was 78 years (65–91). Patients were asked if their QOL had improved from presurgery time. Of the 20 patients who answered the questions, 15 (75%) reported an improvement in QOL, 1 (5%) could not answer this question, and 2 (10%) could not report any change. In total, two subjects reported a negative impact on QOL because

of the persistence of urinary symptoms. Those two patients regretted having had obliterative treatment, but none of them reported a recurrence of prolapse or a change of body image.³⁴

Reisenauer et al. used a visual analog scale to assess patients' QOL 14 months^{3–41} after surgery. The mean age at the operation was 81.9 (± 6.4). Thirty-four of 38 subjects (89%) reported that their QOL was “much better” and two (5%) “somewhat better” after obliterative treatment. Two patients (5%) reported their QOL as “neither better nor worse.” No patient regretted the surgery and all of them would choose to have colpopoiesis procedure again.³⁵

Body image

Six studies assessing changes in body image after colpopoiesis were analyzed. Three articles assessed body image using the modified Body Image scale (BIS) to evaluate the impact of POP on the patient's body image. Jelovsek and Barber further elaborated on this questionnaire for women with urogenital prolapse. The questionnaire includes an eight item-scale, while lower scores indicate improved body image.⁴ Although the authors who used the BIS defined different follow-up times from 6 and¹⁷ 24 weeks¹⁴ to 3 years,¹⁵ the mean and total body image scores demonstrated a significant improvement compared to preoperative values in all the three studies. Results of the BIS are summarized in Table 2.

FitzGerald et al.²⁴ recruited 152 patients and asked them how they thought their body looked and felt like, 1 year after partial or total colpopoiesis for POP treatment. While 80 patients (61%) indicated their body looked better compared to before the surgery, 49 (37%) women reported their body looked the same and only two (2%) noted a worsening in the way their body looked. Interestingly, 121 (92%) patients indicated their body felt better and only three (2%) thought their body felt worse.

Katsara et al.³⁴ reached 20 patients for a survey after a mean follow-up time of 41 months (range 10–120). Two of the 20 women reported a change in body image after colpopoiesis, one of them could not define the reason and the other patient did not feel correctly informed.

Table 3. Reasons for regret and use of the DRS after colpocleisis for pelvic organ prolapse.

Year	Author	Number of patients	Mean age at operation time (years)	Follow up	DRS score	Comments	Reasons for regret (n)	Sexuality before surgery	Sexuality after surgery
2020	Winkelman et al.	73	All Patients: (n=73) 78.1 (75.2–84.9), Phone call follow-up: (n=32) 77.3 (70.2–82.9)	6 years (IQR, 6.0–8.5 years)	2.5 (0.0–15.0) (n=32)	No regret: 15 (46.9%) mild regret: 11 (34.4%) moderate regret 0 (0%) strong regret: 4 (12.5%) (n=32)	Lower urinary tract symptoms	n.s.	n.s.
2016	Crisp et al.	90	78.8 ± 6.1 (n=61)	24 weeks	1.52 (±0.69) (n=61)	–	New onset urinary symptoms: 3 postoperative complications: 1 loss of vaginal sexual function: 1	n.s.	n.s.
2015	Takase-Sanchez et al.	150	79.32 ± 6.99 (n=77)	2.5 years (IQR 6 weeks – 7 years)	1.75 (±0.90) (n=77)	–	–	4 (n=75)	n.s.
2013	Crisp et al.	87	79.4 (±5.83) (n=87)	6 weeks	1.32 (±0.59) (n=79)	–	New-onset urinary complaints: 8 need of urinary catheter postoperatively: 1 need for physical therapy: 1 postoperative vaginal discharge: 1 ‘missing sex’: 1	2	1 remained sexually active 2 additional subjects reported new sexual activity

DRS: decision regret scale; n.s.: not specified.

Barber et al.⁶ aimed to determine if reconstructive and obliterative surgery for POP improves body image. Subjects completed a body image scale according to Hopwood et al.,³⁶ 6 and 12 months after surgical treatment. However, body image scores were similar between the two treatment options (median (range): obliterative, 0.5 (0–8); reconstructive, 0.5 (0–8), $p=0.59$). The patients were asked if they felt “less physically attractive” (obliterative, 7% (2/30) versus reconstructive, 3% (1/39)), “less feminine” (obliterative, 13% (4/30) versus reconstructive, 21% (8/39)) and “less sexually attractive” (obliterative, 13% (4/30) versus reconstructive, 10% (3/39) after surgery. There was no significant difference between the two groups.

Regret

A total of 21 articles analyzing regret after colpocleisis were found. In four articles, the Decision Regret Scale (DRS) was used, a questionnaire that has been validated in women with pelvic floor disorders. It consists of five items with a five-point response scale and was designed to measure regrets after healthcare decisions. The score ranges

from 0 to 100 with lower scores indicating less regret.³⁷ Winkelman et al. reached 32 patients for a telephone survey after a median follow-up time of 6 years (range 5–15 years) and a median age of 77.3 (70.2–82.9) years at the survey. The DRS showed a mean score of 2.5 (0.0–15.0). 15 women (53.1%) reported no regret, 11 (34.4%) reported mild regret and 4 (12.5%) reported strong regret. The patients with mild to strong regret were encouraged to provide reasons. All of them reported symptoms on the PFDI-20, and no patient regretted the loss of coital function¹⁸ (Table 3).

Crisp et al. used the DRS in 2013 for 87 patients with a mean age of 79.4 (±5.83) years at the 6-week postoperative visit. In these subjects, the mean score was 1.32 (SD 0.59), signifying very little regret. Patients reporting regret were given the opportunity to provide reasons. In total, 12 patients (13.8%) described reasons for regret. Eight were due to new-onset urinary symptoms which was the most common reason cited after colpocleisis. Three patients reported the need for postoperative physical therapy, postoperative vaginal discharge, and urinary catheter. One woman who denied being sexually active before the surgical treatment described remorse regarding

loss of vaginal intercourse.¹⁷ The same author reached in 2016 sixty-one patients with the mean age of 78.8 (± 6.1) years to respond to a 24-week follow-up questionnaire. DRS showed a mean score of 1.52 (SD 0.69), supporting little regret. Three subjects regretted colpocleisis because of urinary tract symptoms, and one regret was due to complications after surgery like incomplete bladder emptying and required intermittent self-catheterization. Only one subject regretted having colpocleisis due to loss of coital function.¹⁴

Seventy-seven subjects in Takase-Sanchez et al.'s study with a mean age of 79.32 (± 6.99) years at the time of surgery completed the survey after a median follow-up time of 2.5 years (6 weeks to 7 years). The mean regret score was 1.75 (SD 0.9). In total, 4 (5.3%) patients reported being sexually active before the surgical treatment. Their study revealed that women who were sexually active before colpocleisis demonstrated a higher level of regret with their decision.³⁸

Further authors reported that patients regretted obliterative treatment because of loss of sexual function. Cornille et al.³⁹ reported that a 73-year-old patient among the 17 women (6%) who could be reached for a telephone survey after a follow-up time of 23.89 months (SD 15) did no longer wish vaginal intercourse before colpocleisis and changed her mind after having surgical intervention.

In total, two patients of 208 (0.98%) regretted having colpocleisis in a study by Wang et al. because both patients remarried after the surgical treatment and could not have transvaginal intercourse again. The mean age at operation time was 72.9 (± 5.21) years, and the mean follow-up time was 60.7 (± 34.18) months.⁴⁰

Von Pechmann et al. could contact 62 patients by telephone for subjective outcomes 23.89 (± 15) months after total colpocleisis. Regret over the loss of coital function occurred to eight of them (12.9%). However, four of the eight stated that they would make the decision to have obliterative treatment again, three were uncertain and one patient would not.⁴¹

Lu et al. conducted a retrospective cohort study to compare outcomes of a LeFort colpocleisis-retained uterus group with a total colpocleisis group along with concomitant vaginal hysterectomy. In this study, 1 (0.6%) patient reported regret because of loss of sexual intercourse, whereas 171 (99.4%) patients expressed no regret. The median follow-up time in the CH group was 43.0 months, and the mean age was 76.0 (± 4.9) years.¹³

Furthermore, six authors reported that none of their patients regretted having lost coital ability after colpocleisis.^{5,8,18,20,22,42}

Wang et al.,¹⁵ Song et al.,¹⁶ Ertas et al.,³³ and Reisenauer et al.³⁵ showed in their studies that none of the subjects regretted having chosen the colpocleisis procedure in general.

Sexuality after colpocleisis

Sexual activity in women after colpocleisis was discussed in three published studies.

Deval⁴³ noted that 13 patients (52%) remained sexually active by clitoral stimulation after the obliterative intervention.

FitzGerald et al. wanted to know how the sexual function of the subjects has changed since colpocleisis. Two patients (3%) indicated that their sexual function was "worse," with 69 (87%) stating it was the same and 8 (10%) reported sexual function was "better."²⁴

Crisp et al. reported that two of 87 subjects were sexually active before the surgery. Since colpocleisis, one patient remained sexually active, whereas two additional subjects, who previously did not report sexual activity, now responded to be sexually active.¹⁷

Discussion

In this article, we provide a review of the literature, focusing on the subjective changes in woman's QOL and body image after colpocleisis, as well as the possible regret and impact on sexual behavior after surgery. To our knowledge, this is the first published article that summarizes the existing evidence on this topic, whereas other review articles regarding obliterative methods were focusing on anatomical results and recurrence of POP.

Colpocleisis and obliterative techniques in general only represent a small fraction of the available surgical procedures for the treatment of POP, but there is evidence that they are becoming increasingly popular. In the United States, obliterative procedures increased from 0.77% to 2.19% of POP surgeries ($p < 0.0001$ for trend) between 2002 and 2012,⁴⁴ and in Canada, colpocleisis rates rose from 0.1 to 0.3 per 10,000 women, between 2006 and 2016.⁴⁵ Although still probably small in absolute numbers, the relative increase is substantial (Figure 2). Possible explanations for this fact could be the relative and absolute decrease in the use of alloplastic implants in surgery for POP after the FDA announcement regarding their use in urogynecology, the increasing age of the population, and the increasing demand for surgery due to improved awareness among the elderly, compared to previous generations.

All of the reviewed articles reported a substantial improvement in the QOL of patients after colpocleisis, although information acquisition methods varied significantly. The use of standardized questionnaires, such as the PFDI, ICIQ, and P-QOL, seems to facilitate the interpretation of the results and should be encouraged.

The mean age in all reviewed articles was between 69 and 84 years old. We could not find evidence that age is an important factor in the perception of QOL after colpocleisis, although there was no direct comparison between different age groups. Traditionally, colpocleisis is regarded as a procedure for the elderly and frail, not only because of

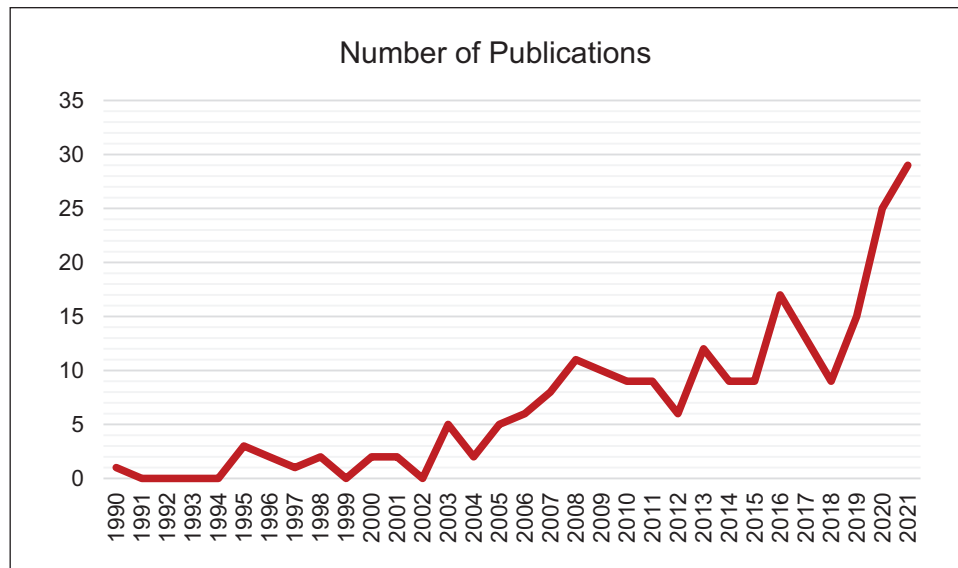


Figure 2. Published Papers on “colpocleisis AND pelvic organ prolapse” on PubMed during the period 1990–2021 (<https://pubmed.ncbi.nlm.nih.gov/?term=colpocleisis%20AND%20pelvic%20organ%20prolapse&sort=pubdate>).

the loss of vaginal coital function but also because it is considered to be minimally invasive, safe, and effective.⁴⁶ Our research revealed that for most surgeons, colpocleisis remains a viable option in women under the age of 80, which is generally considered as the age of frailty or the oldest old.⁴⁷ This approach demands a meticulous patient selection after considering all the social and personal characteristics of each woman. Sexual activity may reduce with age but is not absent and is a main factor of well-being and good health.⁴⁸ Interestingly, some of the women in the studies we reviewed maintained or regained sexual activity after surgery and some also remarried. This fact reflects the observation that the resolving of pelvic floor dysfunction and symptoms may increase sexual desire and activity, which is something that may need to be considered, when consulting female patients before surgery. Furthermore, it should be noted that sexual activity and the ability to come to orgasm to satisfy a partner does not necessarily require vaginal intercourse.

In our review, regret rates after colpocleisis were found to be low in general but quite variable. The main reason for regret was by far persistent or de novo urinary symptoms, followed by complications of surgery and loss of coital function. Again, none of these parameters were the primary outcome measure in the studies performed, and not all authors used standardized or validated methods for the assessment of regret, so the results should be evaluated with caution. The highest regret rate was reported by Winkelman et al.¹⁸ at a telephone follow-up 5–15 years after colpocleisis, with 46.9% of patients reporting mild or strong regret for the procedure, giving as the main reason symptoms in the PFDI questionnaire, while none regretted the loss of coital function. Regret on the basis of coital loss varied and, when present, it was found to be between 0.6%

in the study of Lu et al. and 12.8% in the study of Lu et al.¹³ and Von Pechmann et al.⁴¹ The authors of the latter assume that women after prolapse surgery may resume social activities and obtain a different perspective on sexual activity. This may also reflect the fact that body image and subjective attractiveness massively improved after surgery in the studies we reviewed. In fact, as shown by Barber et al.,⁶ there were no significant differences in body image scores when reconstructive and obliterative procedures in women with mean age between 74.5 and 77.8 were compared.

The aim of this article was to systematically assess the impact of colpocleisis for pelvic organ prolapse on women’s QOL but also on body image and sexuality. We focused on patient-reported and functional outcomes instead of surgeon-assessed anatomical success, which, in our opinion, is of utmost importance. This article, however, is not without limitations. First, it was impossible to provide comparative results. The included studies varied significantly in terms of assessment methods and surgical procedures. Randomized trials comparing obliterative and reconstructive methods would raise significant ethical concerns and are not feasible. There was also a wide variety of different questionnaires that were used, mostly concerning QOL. Second, although we did perform our research in two major search engines (SCOPUS and PUBMED), it is possible that we have missed articles that are not listed in these databases. We did however include articles in languages other than English.

Conclusion

Colpocleisis remains a viable option for POP, without compromising QOL, body image, or sexuality, but diligent patient selection is needed. Particular concern should be

given to bladder and bowel symptoms since these are the main reasons for dissatisfaction after colpopoiesis.

Author contribution(s)

Laetitia Felder: Formal analysis; Investigation; Methodology; Resources; Writing – original draft.

Viola Heinzelmann-Schwarz: Conceptualization; Validation; Writing – review & editing.

Tilemachos Kavvadias: Conceptualization; Formal analysis; Supervision; Writing – review & editing.

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