Surgical treatment of pelvic organ prolapse in women aged ≥75 years in Hong Kong: a multicentre retrospective study

Daniel Wong *, YT Lee, Grace PY Tang, Symphorosa SC Chan

ABSTRACT

Introduction: Pelvic organ prolapse (POP) is common among older women. With the increasing lifespan and emphasis on quality of life worldwide, older women increasingly prefer surgical treatment for POP. We reviewed the surgical treatment of POP in older women to characterise its safety, effectiveness, and the type most often selected.

Methods: This multicentre, retrospective study was conducted at four hospitals between 2013 and 2018. Included patients were aged ≥75 years and had undergone POP surgery. We compared patient demographic characteristics, POP severity, and surgical outcomes between reconstructive and obliterative surgeries; these comparisons were also made among vaginal hysterectomy plus pelvic floor repair (VHPFR), transvaginal mesh surgery (TVM), vaginal hysterectomy (VH) plus colpocleisis, and colpocleisis alone.

Results: In total, 343 patients were included; 84.3% and 15.7% underwent reconstructive and obliterative surgeries, respectively. Overall, 246 (71.7%), 43 (12.5%), 20 (5.8%), and 34 (9.9%) patients underwent VHPFR, TVM, VH plus colpocleisis, and colpocleisis alone, respectively. Patients who were older (81.9 vs 79.6 y; P=0.001), had vault prolapse (38.9% vs 3.5%; P<0.001), and had medical co-morbidities (37% vs 4.8%; P<0.001) chose obliterative surgery more frequently than reconstructive surgery. Obliterative surgeries had shorter operative time (73.5 min vs 107 min; P<0.001) and fewer surgical complications (9.3% vs 28.0%; P=0.003). Vaginal hysterectomy plus pelvic floor repair had the highest rate of surgical complications (most were minor), while colpocleisis alone had the lowest rate (30.1% vs 8.8%; P=0.01).

Conclusions: Pelvic organ prolapse surgeries were safe and effective for older women. Colpocleisis may be appropriate as primary surgery for fragile older women.

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New knowledge added by this study

- The most common type of pelvic organ prolapse (POP) surgery was vaginal hysterectomy plus pelvic floor repair. Patients who were older (81.9 vs 79.6 y; P=0.001), had medical co-morbidities (37% vs 4.8%; P<0.001), had a history of pelvic floor repair surgery (13% vs 1.7%; P=0.001), and had vaginal vault prolapse (38.9% vs 3.5%; P<0.001) chose obliterative surgery more frequently than reconstructive surgery.
- Because all types of POP surgery were associated with no mortality and generally had self-limiting surgical complications, they are safe for women aged ≥75 years. However, fluid replacement should be cautiously administered in fragile patients and in patients susceptible to fluid overload.
- Colpocleisis alone had the shortest operative time (60 min; P<0.001), least blood loss (50 mL; P<0.001), and fewest surgical complications (8.8%; P=0.01). Moreover, 76.5% of procedures comprising colpocleisis alone were performed under spinal anaesthesia (P<0.001).

Implications for clinical practice or policy

- All four types of POP surgeries are safe and effective for the treatment of POP in older women.
- The incidence of carcinoma of the corpus uteri (Ca corpus) was 0.3% in this study. To reduce the risk of missing Ca corpus, preoperative transvaginal ultrasound (to assess endometrial thickness) and endometrial aspiration should be considered women who plan to undergo uterine-preserving surgery.
- Comparison of vaginal hysterectomy plus colpocleisis and colpocleisis alone showed that the combined treatment had a longer operative time and greater blood loss, but a comparable rate of complications. Therefore, vaginal hysterectomy plus colpocleisis remains a valid treatment option. Both methods involving colpocleisis lead to difficulty in assessment of the cervix and uterus regardless of pathology.
- Colpocleisis alone had the shortest operative time, least blood loss, and fewest surgical complications. These excellent results suggest that colpocleisis may be appropriate as primary surgery for fragile older women who do not engage in sexual intercourse.

香港75歲或以上女性盆腔器官脫垂的手術治療：多中心回顧性研究

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引言：盆腔器官脫垂（POP）在老年女性很常見。壽命的延長和對生活質量的重視，越來越多老年婦女選擇手術治療。我們回顧老年女性POP的手術治療特徵，以描述其安全性、有效性和最常選擇的類型。

方法：這項多中心回顧性研究於2013年至2018年間在四間醫院進行。納入的患者年齡75歲或以上，接受過POP手術。我們比較重建手術和閉塞手術之間的患者人口統計學特徵、POP嚴重程度和手術結果；以及比較陰道子宮切除術加盆底修復術（VHPFR）、經陰道網狀手術（TVM）、陰道子宮切除術（VH）加陰道鎖閉術和單獨陰道鎖閉術。

結果：共納入343名患者；84.3%和15.7%分別接受重建和閉塞手術。總體而言，分別有246名（71.7%）、43名（12.5%）、20名（5.8%）和34名（9.9%）患者接受VHPFR、TVM、VH加陰道閉合術和單獨陰道閉合術。年齡較大（81.9歲比79.6歲；P=0.001）、有穹窿脫垂（38.9%比3.5%；P<0.001）和有共病（37%比4.8%；P<0.001）的患者選擇閉塞性手術的機會比重建手術高。閉塞性手術的手術時間較短（73.5分鐘比107分鐘；P<0.001），手術併發症更少（9.3%比28.0%；P=0.003）。VHPFR的併發症發生率最高（大多數是輕微的），而單獨陰道鎖閉手術併發症發生率最低（30.1%比8.8%；P=0.01）。

結論：POP手術對老年女性安全有效。對於脆弱的老年婦女，陰道鎖閉術可能適合作為主要手術。

Introduction

The incidence of pelvic organ prolapse (POP) is reportedly near 50% and the lifetime risk of POP requiring surgery is approximately 20%.[1,2] With the increasing lifespan and emphasis on quality of life worldwide, older women increasingly prefer surgical treatment, instead of vaginal pessaries, as definitive treatment for POP.[3] Surgical treatment options are either reconstructive or obliterative. Reconstructive surgery comprises native tissue repair (mainly vaginal hysterectomy [VH]), pelvic floor repair, and mesh-related repair; obliterative surgery comprises colpocleisis with or without concomitant VH.

Older women who undergo urogynaecological surgery have a higher surgical risk, regardless of fragility index; they have lower risks of prolapse recurrence and repeated surgery.[4] Although the World Health Organization has defined old age as ≥65 years,[5] a threshold of ≥75 years may be more appropriate for older women in terms of fragility and need for care. A previous Hospital Authority ageing projection[6] indicated that the number of individuals aged 75 to 84 years will substantially increase in Hong Kong, while the numbers of individuals aged ≥85 years or ≤74 years will remain comparatively stable. A threshold of ≥75 years for geriatric medicine may be reasonable because most chronic, complex disabling disease occurs among individuals in this age-group.[7]

To our knowledge, despite the increasing number of women aged ≥75 years and the need for surgical treatment of POP among these individuals, there is limited evidence regarding the risks and benefits of the available surgical options. This multicentre, retrospective study was performed to review the surgical treatment of POP in women aged ≥75 years; we aimed to characterise its safety, effectiveness, and the type most often selected. We hope that the findings will help clinicians to counsel older women with POP who are considering surgical treatment.

Methods

Patients

This multicentre, retrospective cohort study was conducted at Kwong Wah Hospital, Pamela Youde Nethersole Eastern Hospital, Princess Margaret Hospital, and Prince of Wales Hospital. We included patients aged ≥75 years, all of whom underwent surgical treatment of POP in one of the above four gynaecological units between 2013 and 2018. We reviewed patient information from the Clinical Data Analysis and Reporting System and Clinical Medical System; for patients with incomplete data in the Clinical Medical System, we reviewed paper-based medical records. Ethical approvals were obtained from the Institutional Review Boards of all four Clusters including Hong Kong East Cluster, Kowloon Central Cluster, Kowloon West Cluster and New Territories East Cluster.

Examination and treatment selection

Demographic data and symptoms of prolapse were collected during each patient's first visit to a participating gynaecology unit. Physical examinations were conducted to confirm POP, stage of prolapse, and the compartments involved; all examinations were performed using the International Continence Society Pelvic Organ Prolapse Quantification (POP-Q) staging system.[8] Patients were offered vaginal pessary management or surgical treatment. Patients who opted for surgical treatment were scheduled for surgery with or without a trial period of vaginal pessary management. Preoperative urodynamics studies were performed if indicated. During the preoperative assessment, each patient underwent a comprehensive evaluation that included patient-reported symptoms of prolapse, as well as urinary, intestinal, and sexual statuses; they also underwent prolapse assessment using POP-Q staging. Thorough counselling was provided regarding reconstructive and obliterative treatment options, including a discussion of the potential benefits and risks of both procedures, as well as

the need for concomitant VH or mid-urethral sling transobturator tape (TVT-O) for urodynamic stress incontinence.

Surgical procedures

Reconstructive procedures involved native tissue repair and mesh-related surgery. Native tissue repair mainly comprised vaginal hysterectomy followed by pelvic floor repair (VHPFR; eg, anterior and/or posterior colporrhaphy). In addition, sacrospinous ligament fixation was performed for stage ≥III uterine prolapse or vaginal vault prolapse. Patients with stage ≥III anterior compartment prolapse were offered anterior vaginal mesh repair. Obliterative surgery comprised colpocleisis with or without concomitant VH. Anterior vaginal mesh repair and colpocleisis were only offered to patients who were sexually inactive before surgery or agreed not to engage in sexual intercourse. Combinations of concomitant procedures were performed in the following order, using only the procedures selected by each patient and their surgeon: VH, mesh placement and sacrospinous fixation, native tissue repair, and TVT-O placement. All native tissue repair procedures were performed or supervised by a gynaecological specialist; all sacrospinous ligament fixation or anterior vaginal mesh repair procedures were performed or supervised by urogynaecologists. One dose of prophylactic intravenous antibiotic was administered during anaesthesia induction. In patients who underwent reconstructive surgery, one piece of vaginal gauze was placed to achieve haemostasis for 1 day. A Foley catheter was placed to ensure urinary drainage for 1 to 2 days according to the procedures used in each unit. Operative time, intra-operative blood loss, perioperative complications, and postoperative adverse events were recorded. Postoperative fever was defined as ≥2 readings of temperature ≥38°C with no positive culture or identifiable cause. A diagnosis of urinary tract infection was made on the basis of positive midstream urine culture results. A diagnosis of urinary retention was made when a patient could not void and required catheterisation. All instances of postoperative haematoma were diagnosed by imaging (ultrasound or computed tomography scan). When available, pathology reports were also reviewed.

Postoperative assessments

All patients underwent the same postoperative assessment, which was structured using a standardised datasheet. Follow-up visits were scheduled at 6 to 12 weeks and 1 year after surgery, then annually until 5 years after surgery. Each follow-up visit evaluation included assessments of urinary and intestinal function; symptoms of prolapse, vaginal pain and dyspareunia; and symptoms of mesh erosion. Vaginal examinations and POP-Q assessments were performed to identify instances of POP recurrence or mesh-related complications, in accordance with the recommendations of the International Continence Society and the International Urogynecological Association.[9] Prolapse recurrence was defined as the presence of subjective symptoms of prolapse or a POP-Q stage of ≥II in a clinical examination.

Statistical analysis

We compared patient demographic characteristics, POP severity, and surgical outcomes between two groups: reconstructive and obliterative surgeries. These comparisons were also made among four subgroups: VHPFR, transvaginal mesh surgery (TVM), VH plus colpocleisis, and colpocleisis alone. Statistical analyses were performed using SPSS (Windows version 26.0; IBM Corp, Armonk [NY], United States). Descriptive statistics were used to summarise demographic and clinical characteristics. Continuous variables were expressed as mean (standard deviation) or median (interquartile range); they were analysed by independent-samples *t* tests or the Mann-Whitney *U* test (comparison of two groups)/one-way analysis of variance or Kruskal–Wallis H test (comparison of ≥3 groups), depending on the normality of the data assessed by Shaprio–Wilk test. Categorical data were expressed as numbers and percentages; the Chi squared test and Fisher's exact test were used for categorical data analysis. A P value of <0.05 was considered statistically significant.

Results

In total, 343 patients underwent surgery for POP from 2013 to 2018 in the study hospitals. The types of surgical treatment at each hospital are shown in Table 1. Vaginal hysterectomy plus pelvic floor repair procedures were evenly distributed among all four hospitals. However, 93% of TVM procedures, 95% of VH plus colpocleisis procedures, and 50% of procedures comprising colpocleisis alone were performed in Prince of Wales Hospital, Princess Margaret Hospital, and Pamela Youde Nethersole Eastern Hospital, respectively.

Among the 343 patients, 216 (63%), 90 (26.2%), and 37 (10.8%) had stages II, III, and IV POP, respectively (Table 2). Furthermore, 289 (84.3%) patients underwent reconstructive surgery and 54 (15.7%) patients underwent obliterative surgery. Of the 289 reconstructive surgeries, 246 (71.7%) were native tissue repair procedures (mainly VHPFR), while 43 (12.5%) were TVM (36 had concomitant VH); among the 54 obliterative surgeries, 20 (5.8%) were colpocleisis plus VH, while the remaining 34 (9.9%) were colpocleisis alone (Table 3).

TABLE 1. Type of surgical treatment performed in women aged ≥75 years with pelvic organ prolapse in the study hospitals*

Hospital	Total (n=343)	Reconstructive (n=289)		Obliterative (n=54)		P value
		VHPFR (n=246)	TVM (n=43)	VH plus colpocleisis (n=20)	Colpocleisis alone (n=34)	
Prince of Wales Hospital	125 (36.4%)	82 (33.3%)	40 (93.0%)	0	3 (8.8%)	<0.001
Princess Margaret Hospital	83 (24.2%)	51 (20.7%)	3 (7.0%)	19 (95.0%)	10 (29.4%)	
Pamela Youde Nethersole Eastern Hospital	95 (27.7%)	78 (31.7%)	0	0	17 (50.0%)	
Kwong Wah Hospital	40 (11.7%)	35 (14.2%)	0	1 (5.0%)	4 (11.8%)	

Abbreviations: TVM = transvaginal mesh surgery; VH = vaginal hysterectomy; VHPFR = vaginal hysterectomy plus pelvic floor repair
* Data are shown as No. (%), unless otherwise specified

TABLE 2. Comparison of demographic and clinical characteristics between reconstructive and obliterative surgery groups*

	Reconstructive (n=289)	Obliterative (n=54)	P value
Age, y	79.6 ± 3.8	81.9 ± 4.8	0.001
Medical co-morbidities	14 (4.8%)	20 (37.0%)	<0.001
History of pelvic floor repair surgery	5 (1.7%)	7 (13.0%)	0.001
Parity	4 (3-5)	4 (2.8-5)	0.376
No. of vaginal births	4 (3-5)	4 (2-5)	0.309
Smoking	4 (1.4%)	0	1
Coital activity	4 (1.4%)	0	1
Urinary retention symptoms	71 (24.6%)	25 (46.3%)	0.003
Unsatisfactory vaginal pessary outcome	158 (54.7%)	44 (81.5%)	0.184
Weight, kg	55.16 ± 7.95	54.93 ± 11.01	0.894
Height, m	1.49 ± 0.06	1.48 ± 0.07	0.317
Body mass index, kg/m^2	25.25 ± 4.40	25.29 ± 3.56	0.979
Diagnosis			<0.001
Uterine prolapse	279 (96.5%)	33 (61.1%)	
Vaginal vault prolapse	10 (3.5%)	21 (38.9%)	
POP-Q stage			<0.001
Stage II	205 (70.9%)	11 (20.4%)	
Stage III	73 (25.3%)	17 (31.5%)	
Stage IV	11 (3.8%)	26 (48.1%)	

Abbreviation: POP-Q = Pelvic Organ Prolapse Quantification
* Data are shown as No. (%), mean ± standard deviation, or median (interquartile range), unless otherwise specified

Table 2 compares demographic and clinical characteristics between the reconstructive and obliterative surgery groups. Patients with more advanced age chose obliterative surgery, rather than reconstructive surgery (81.9 vs 79.6 y; P=0.001). Other variables including parity, number of vaginal births, number of instrumental deliveries, body mass index, smoking, and coital activity were comparable between the two groups.

More patients with vaginal vault prolapse opted for obliterative surgery, rather than reconstructive surgery (38.9% vs 3.5%; P<0.001) [Table 2]. The difference was more striking when the colpocleisis alone group was compared with all patients who underwent reconstructive surgery (61.8%; P<0.001) [Table 3]. Moreover, the number of patients who had medical co-morbidities (eg, hypertension, diabetes mellitus, heart disease, or history of stroke) was greater in the obliterative surgery group than in the reconstructive surgery group (37% vs 4.8%, P<0.001) [Table 2].

Concerning patients with stage III/IV POP,

TABLE 3. Comparison of demographic and clinical characteristics among the four surgical subgroups*

	VHPFR (n=246)	TVM (n=43)	VH plus colpocleisis (n=20)	Colpocleisis alone (n=34)	P value
Age, y	79.6 ± 3.9	79.8 ± 3.2	80.6 ± 3.9	82.7 ± 5.2	0.012
Medical co-morbidities	8 (3.3%)	6 (14.0%)	0	20 (58.8%)	<0.001
History of pelvic floor repair surgery	3 (1.2%)	2 (4.7%)	0	7 (20.6%)	<0.001
Parity	4 (3-5)	4 (3-5.5)	3.5 (2-5.75)	4 (3-5)	0.738
No. of vaginal births	4 (3-5)	4 (3-5.75)	3.5 (2-5.75)	4 (2.5-5)	0.682
Smoking	3 (1.2%)	1 (2.3%)	0	0	0.733
Coital activity	2 (0.8%)	2 (4.7%)	0	0	0.154
Urinary retention	58 (23.6%)	13 (30.2%)	14 (70.0%)	11 (32.4%)	<0.001
Unsatisfactory vaginal pessary outcome	136 (55.3%)	20 (46.5%)	18 (90.0%)	26 (76.5%)	0.001
Weight, kg	54.9 ± 7.8	56.3 ± 8.7	57. 7 ± 8.8	53.1 ± 12.1	0.375
Height, m	1.49 ± 0.05	1.51 ± 0.08	1.48 ± 0.07	1.47 ± 0.08	0.484
Body mass index, kg/m^2	24.97 ± 3.86	26.89 ± 6.88	25.60 ± 3.97	24.05 ± 0.49	0.667
Diagnosis					<0.001
Uterine prolapse	243 (98.8%)	36 (83.7%)	20 (100.0%)	13 (38.2%)	
Vaginal vault prolapse	3 (1.2%)	7 (16.3%)	0	21 (61.8%)	
POP-Q stage					<0.001
Stage II	205 (83.3%)	0	0	11 (32.4%)	
Stage III/IV	41 (16.7%)	43 (100.0%)	20 (100.0%)	23 (67.6%)	

Abbreviations: POP-Q = Pelvic Organ Prolapse Quantification; TVM = transvaginal mesh surgery; VH = vaginal hysterectomy; VHPFR = vaginal hysterectomy plus pelvic floor repair

* Data are shown as No. (%), mean ± standard deviation, or median (interquartile range), unless otherwise specified

more patients underwent TVM, rather than VHPFR, in the reconstructive surgery group (100% vs 16.7%; P<0.001); in the obliterative surgery group, more patients with stage III/IV POP underwent VH plus colpocleisis, rather than colpocleisis alone (100% vs 67.6%; P<0.004) [Table 3].

One case of carcinoma of the corpus uteri (Ca corpus) was confirmed from the pathology report of a patient who underwent VH. Thus, the incidence of Ca corpus was 0.3% (1/312). The affected woman was an asymptomatic patient in the TVM group; she had incidental findings of endometrial thickening during preoperative assessment. The results of endometrial aspiration could not exclude a diagnosis of hyperplasia. The patient underwent postoperative contrast-enhanced computed tomography of the abdomen and pelvis 2 months after surgery; there were no signs of distant metastasis. After detailed counselling, the patient refused further surgery or adjuvant therapy. For 25 months of follow-up, the patient's cancer has remained in remission.

Table 4 shows surgical outcomes in both groups and all subgroups. Compared with obliterative surgeries, fewer reconstructive surgeries were performed under spinal anaesthesia (57.4% vs 38.1%; P=0.008). Notably, 76.5% of procedures comprising colpocleisis alone were performed under spinal anaesthesia (P<0.001). Obliterative surgeries had a shorter operative time (73.5 min vs 107 min; P<0.001) and fewer surgical complications (9.3% vs 28.0%; P=0.003) than did reconstructive surgeries. Among the four subgroups, colpocleisis alone had the shortest operative time (60 min; P<0.001) and least blood loss (50 mL; P<0.001).

Analysis of surgical complications (Table 4) showed that the VHPFR group had the highest intra- and peri-operative complication rate (30.1%; P=0.01), compared with the other subgroups. In the VHPFR group, four (1.6%) patients required conversion to laparoscopy/laparotomy (two had dense adhesion, one had large uterine size, and one had difficulty achieving haemostasis). There were three (1.2%) bladder injuries; all underwent primary repair with good recovery and did not experience long-term consequences. Four (1.6%) patients in the VHPFR group required intensive care unit (ICU) admission after surgery (one had fluid overload, one had respiratory acidosis, one had cardiac problems, and one had metabolic acidosis). In all, 29 (11.8%) patients had fever of unknown cause; 90% of them resolved by oral antibiotics. Ten (4.1%) patients had postoperative wound or pelvic haematoma, and

TABLE 4. Comparison of surgical outcomes between reconstructive and obliterative surgery groups and among the four surgical subgroups*

	Reconstructive (n=289)	Obliterative (n=54)	P value	VHPFR (n=246)	TVM (n=43)	VH plus colpocleisis (n=20)	Colpocleisis alone (n=34)	P value
Anaesthesia			0.008					<0.001
SA	110 (38.1%)	31 (57.4%)		99 (40.2%)	11 (25.6%)	5 (25.0%)	26 (76.5%)	
GA	179 (61.9%)	23 (42.6%)		147 (59.8%)	32 (74.4%)	15 (75.0%)	8 (23.5%)	
Concomitant TVT-O placement	44 (15.2%)	2 (3.7%)	0.023	30 (12.2%)	14 (32.6%)	1 (5.0%)	1 (2.9%)	0.001
Operative time, min	107 (80.5-133)	73.5 (58-109.3)	<0.001	100 (77-125)	135 (117-165)†	123.5 (103.3-138.8)	60 (52.8-72.8)†‡§	<0.001
Blood loss, mL	100 (50-200)	100 (27.5-140)	0.007	100 (50-150)	200 (100-300)†	160 (100-275)	50 (20-100)†‡§	<0.001
Complications	81 (28.0%)	5 (9.3%)	0.003	74 (30.1%)	7 (16.3%)	2 (10.0%)	3 (8.8%)	0.01
Conversion to laparotomy or laparoscopy	4 (1.4%)	0		4 (1.6%)	0	0	0	
Bladder injury	3 (1.0%)	0		3 (1.2%)	0	0	0	
Postoperative ICU care	5 (1.7%)	0		4 (1.6%)	1 (2.3%)	0	0	
Wound/pelvic haematoma	10 (3.5%)	2 (3.7%)		10 (4.1%)	0	1 (5.0%)	1 (2.9%)	
Urinary tract infection	11 (3.8%)	0		10 (4.1%)	1 (2.3%)	0	0	
Urinary retention	10 (3.5%)	0		7 (2.8%)	3 (7.0%)	0	0	
Postoperative fever	29 (10.0%)	3 (5.6%)		29 (11.8%)	0	1 (5.0%)	2 (5.9%)	
Blood transfusion	8 (2.8%)	0	1	7 (2.8%)	1 (2.3%)	0	0	0.538
Postoperative hospital stay, d	3 (2-5)	3 (2.8-4)	0.675	3 (2-5)	2 (2-5)	3 (3-5)	3 (2-4)	0.134
Follow-up duration, mo	13 (4-26)	17 (5.75-25.3)	0.393	12 (4-24)	25 (12-42)†	9 (3-24)‡	18 (10-29.4)	<0.001
Recurrent prolapse	47 (16.3%)	4 (7.4%)	0.092	44 (17.9%)	3 (7.0%)	1 (5.0%)	3 (8.8%)	0.091
Stage of prolapse			1					1
Stage II	36 (90.0%)	4 (100.0%)		35 (89.7%)	1 (100.0%)	1 (100.0%)	3 (100.0%)	
Stage III/IV	4 (10.0%)	0		4 (10.3%)	0	0	0	
Recurrent prolapse requiring re-operation	6 (2.1%)	0	0.595	6 (2.4%)	0	0	0	0.857
Postoperative SUI requiring continence surgery	2 (0.7%)	0	1	2 (0.8%)	0	0	0	1
Mesh erosion	NA	NA	1	NA	1 (2.3%)	NA	NA	-

Abbreviations: GA = general anaesthesia; ICU = intensive care unit; NA = not applicable; SA = spinal anaesthesia; SUI = stress urinary incontinence; TVM = transvaginal mesh surgery; TVT-O = transobturator tape; VH = vaginal hysterectomy; VHPFR = vaginal hysterectomy plus pelvic floor repair

* Data are shown as No. (%), mean ± standard deviation, or median (interquartile range), unless otherwise specified

† P<0.05 vs VHPFR group

‡ P<0.05 vs TVM group

§ P<0.05 vs VH plus colpocleisis group

10 (4.1%) patients had urinary tract infection. In the TVM group, one (2.3%) patient required ICU admission because of fluid overload, while three (7%) patients had urinary retention after surgery. The VH plus colpocleisis and colpocleisis alone groups both included one patient with wound haematoma. In the TVM group, 32.6% of patients had concomitant TVT-O placement; 12.2%, 5%, and 2.9% of patients had concomitant TVT-O placement in the VHPFR, VH plus colpocleisis, and colpocleisis alone groups, respectively (P=0.001) [Table 4].

The median durations of follow-up were 13 and 17 months in the reconstructive and obliterative surgery groups, respectively (Table 4). The TVM group had a significantly longer median follow-up duration (25 months; P<0.001); this was consistent with the need to monitor any mesh complications. There was only one patient was lost to follow-up throughout the study period. Although there tended to be fewer instances of recurrence in the obliterative

surgery group than in the reconstructive surgery group (7.4% vs 16.3%; P=0.092), the difference was not statistically significant. There also tended to be a higher rate of prolapse recurrence in the VHPFR group than in the TVM, VH plus colpocleisis, or colpocleisis alone groups (VHPFR 18%, TVM 7%, VH plus colpocleisis 5%, and colpocleisis alone 8.8%), but this trend was not statistically significant (P=0.091). Finally, few patients in each group underwent surgery for prolapse recurrence or stress urinary incontinence after surgery.

Discussion

To our knowledge, this is the first multicentre retrospective study in Hong Kong concerning POP surgery for women aged ≥75 years. Overall analysis of demographic characteristics indicated that most patients underwent VHPFR because the largest proportion of patients had stage II POP. Most patients were sexually inactive (only four of 343 patients reported sexual activity), multiparous (median of four births overall), and had a history of exclusively vaginal delivery. The mean body mass index overall was 25.3 kg/m^2. Compared with reconstructive surgery, obliterative surgery was more frequently selected by patients who were older, had medical co-morbidities, had a history of pelvic floor repair surgery, and had vaginal vault prolapse.

In this study, we found that surgical treatment was a safe option for older women who sought to improve their quality of life. The postoperative mortality rate was zero, consistent with the low mortality rate 4.1% in a previous study.[4] Notably, prior studies[10,11] in Chinese populations suggested that poor quality of life and complications associated with vaginal pessary management lead to an increased likelihood of surgical treatment. In our study, over 80% of patients in the obliterative surgery group had an unsatisfactory vaginal pessary outcome; nearly half of the patients also had urinary retention. Therefore, it is reasonable that these patients chose POP surgery, despite their advanced age.

In studies from other countries, the reported rates of surgical complications associated with POP surgery in women aged ≥75 years were 30% to 40%.[12,13] Although the VHPFR group had the highest rate of surgical complications among all subgroups in the present study, the rate of 30.1% was comparable to the rates in studies from other countries. However, 1.7% of patients in the reconstructive surgery group were admitted to the ICU after surgery; this was higher than the reported rate of 0.45% in a large cohort study with a mean patient age of 62.7 years.[14] Because older women are more likely to experience fluid overload—it was present in 40% of the patients who required postoperative ICU care in our study—perioperative fluid replacement should be cautiously administered.

Patients in the obliterative surgery group had fewer surgical complications than did patients in the reconstructive surgery group. When the four types of surgeries were compared, the proportion of surgeries performed under spinal anaesthesia was greatest for procedures comprising colpocleisis alone; these procedures also had the least blood loss, shortest operative time, and fewest complications. Furthermore, the hospital stay in the colpocleisis alone group was comparable with the lengths in other groups, although significantly larger proportions of patients in the colpocleisis alone group had medical co-morbidities and were older.

Theoretically, colpocleisis with concomitant VH is superior to colpocleisis alone because it avoids the possibility of missing Ca corpus during surgery or later in the patient's life[15,16]; however, it is associated with a longer operative time and increased blood loss.[17,18] Our results were consistent with the findings in previous studies from other countries. Patients aged ≥75 years are beyond the peak incidence of Ca corpus: according to the Hong Kong Cancer Registry, the median age of patients with Ca corpus is 55 years.[19] In the present study, one patient in the TVM group had Ca corpus; thus, the rate of incidental malignancy was 0.3%, which was comparable to the rate of 0.26% previously reported in Hong Kong.[20] Currently, pelvic ultrasound is not a routine component of preoperative assessment. To reduce the risk of missing Ca corpus, preoperative transvaginal ultrasound (to assess endometrial thickness) and endometrial aspiration should be considered in women who have abnormal vaginal bleeding or plan to undergo uterine-preserving surgery.[20]

Although TVM is a more complex surgery than VHPFR, the rate of perioperative surgical complications was lower in the TVM group; hospital stays were comparable between the two groups. However, the operative time was longer and blood loss was greater in the TVM group. Compared with patients in the VHPFR group, patients in the TVM group had a lower rate of POP recurrence (all recurrences occurred in patients with stage III/IV POP) and a significantly longer follow-up duration. The mesh erosion rate in this study (2.3%) was lower than in another study in Hong Kong (8.9%), which had a longer follow-up duration of 40 months and included younger patients.[21] When proper counselling is provided, TVM is a safe option for healthier patients with stage III/IV POP because stage III/IV POP is a risk factor for recurrence.[22]

Strengths and limitations

Notable strengths of this study included its

multicentre design and focus on POP surgery among older women in the Hong Kong Chinese population, which has not been previously explored. Patients in this study included all women aged ≥75 years who underwent POP surgery in a 6-year period at four hospitals; these hospitals are jointly accredited as a single urogynaecological training centre under the Hong Kong College of Obstetricians and Gynaecologists, and they have extensive experience performing all types of POP surgery (Table 1). Furthermore, the electronic medical record system of the Hospital Authority facilitated complete data collection and retrieval. However, there were a few limitations in this study. First, it was a retrospective study. Second, we did not perform quality of life assessment or investigate the presence of guilt concerning colpocleisis surgery. Because few patients reported sexual activity before surgery, we presume that most older women in Hong Kong would not regret the selection of colpocleisis because of its effects on sexual activity. Third, although the median follow-up period was <18 months, it may have been insufficient to fully characterise prolapse recurrence and gynaecological malignancy. Finally, the levels of independence and family support may be important factors for older women to consider before making any surgical decision; however, we did not have access to such data. These factors could be examined in future studies.

Conclusion

This multicentre retrospective study showed that multiple types of POP surgeries were safe and effective for women aged ≥75 years. Most surgical complications were self-limiting and the recurrence rate was low. The excellent results suggest that colpocleisis may be appropriate as primary surgery for fragile older women. These findings will facilitate preoperative counselling for older women with POP who are considering surgical treatment.

Author contributions

Concept or design: D Wong, SSC Chan
Acquisition of data: All authors.
Analysis or interpretation of data: D Wong, SSC Chan.
Drafting of the article: D Wong, SSC Chan.
Critical revision for important intellectual content: All authors.

All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

Conflicts of interest

All authors have disclosed no conflicts of interest.

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Ethics approval

This study was approved by the Hong Kong East Cluster Ethics Committee (HKECREC-2020-069), the Kowloon Central Cluster Ethics Committee (KC/KE-20-0223/ER-2), the Kowloon West Cluster Ethics Committee (EX-20-108[150-02]), and the New Territories East Cluster Ethics Committee (NTEC-2020-138).

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