

Surgical complications after pelvic organ prolapse surgery: a Latin American perspective by age

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Abstract

Pelvic organ prolapse (POP) is common among aging women and frequently requires surgical intervention. Concerns about increased surgical risk in elderly patients often lead to conservative treatment. However, evidence from low- and middle-income countries, including Latin America, remains scarce. The objective of this study is to compare perioperative and 1-year postoperative complications between women aged ≥ 60 and < 60 undergoing pelvic reconstructive surgery in a tertiary center. A nested case-control study within a retrospective cohort was conducted, including women who underwent POP surgery. Two age groups were analyzed: < 60 years and ≥ 60 years. Complication rates were compared using chi-square, Fisher's exact test, and odds ratios with 95% confidence intervals. Among 231 patients, 79 were aged ≥ 60 years. Perioperative complications occurred in 10.4% of older vs. 22.1% of younger women. Respectively, 1-year complications were 12.9% vs. 17.2%. De novo urgency was more frequent in older women (25.3%, $p=0.02$). No major complications were observed. POP surgery in women aged ≥ 60 appears safe. Findings support surgical management in elderly patients based on functional rather than chronological age.

Introduction

The World Health Organization defines elderly women as those aged 60 years or older in low- and middle-income countries (LMICs), where the epidemiological transition and access to specialized care differ from high-income settings.¹ In Mexico, this definition is consistent with national health policies and demographic criteria used by institutions. In 2018, the elderly population in Mexico reached 10 million, with a life expectancy of 22.9 years for women starting at age 60. Approximately 32.4% of this population resides in three states: Mexico City, Oaxaca, and Veracruz.² Increasing age is one of the major risk factors for the development of pelvic organ prolapse (POP).

According to the International Urogynecological Association (IUGA) and the International Continence Society (ICS), prolapse refers to the descent of a pelvic organ. Pelvic organs refer to the uterus and/or the different vaginal compartments, along with associated structures such as the bladder, rectum, and intestines. Therefore, POP is by definition an anatomical alteration.³

Symptoms associated with POP, as described by IUGA and ICS, include vaginal bulging, pelvic pressure, bleeding, discharge or infection, splinting, digitation, and low back pain. Additionally, POP may cause voiding symptoms due to incomplete bladder emptying or obstruction.³

In elderly women, POP increases the risk of hydronephrosis and renal failure. It may also cause defecatory dysfunction due to the presence of enterocele or rectocele. These clinical repercussions of prolapse negatively affect quality of life (QoL). Due to these functional and symptomatic consequences, timely treatment

is warranted. Surgical management and the use of pessaries are both treatment options for elderly women. Pessaries are generally preferred when patients decline surgery or have contraindications to surgical management. However, pessaries are not always well tolerated. Their use may be limited by the development of vaginal epithelial lesions or excessive discharge, which can lead to poor adherence.⁴

Given this context, urogynecologists in developing countries are increasingly confronted with elderly women requiring surgical treatment for POP. In previous years, both surgeons and patients were more hesitant to accept the risks of surgery and anesthesia in this group.⁵ This case-control study compares immediate surgical complications and those occurring after 1 year of follow-up between elderly and younger women undergoing prolapse surgery at a urogynecology referral center in Mexico City.

Materials and Methods

This is a retrospective cohort study including women who underwent pelvic reconstructive surgery between January 2013 and June 2017 at a tertiary center in Mexico City. The cohort was stratified into two age groups: <60 years and ≥60 years. Of 255 identified cases, 24 were excluded due to incomplete records, which represents a potential source of selection bias.

The variables analyzed included the number of pregnancies, vaginal births, cesarean sections, birth of a child weighing more than 4000 g, instrumental vaginal deliveries, previous vaginal surgeries, body mass index, and associated comorbidities. The Pelvic Organ Prolapse Quantification (POP-Q) system was used for prolapse staging. All surgeries indicated for prolapse repair were included. Patients who underwent concomitant anti-incontinence procedures were also included.

All complications occurring from the beginning of surgery until 2 weeks postoperatively were classified as immediate complications. These included urinary tract injury, blood loss >500 mL, urinary tract infection, postoperative pain, and wound dehiscence. At the 1-year follow-up, patients were evaluated for de novo stress urinary incontinence, de novo urgency, de novo urgency incontinence, mesh or sling exposure (if applicable), and recurrence of vaginal bulging symptoms.

Descriptive statistical analysis was performed using means and

standard deviations for quantitative variables. For bivariate analysis of qualitative variables, the chi-square (χ^2) test and Fisher's exact test were used.

Crude odds ratios (ORs) with 95% confidence intervals (CIs) were first calculated to evaluate the association between age (≥60 vs. <60 years) and each surgical outcome. Subsequently, multivariable logistic regression models were fitted to obtain adjusted ORs and 95% CIs. In these models, age was included as the primary predictor, and adjustment was made for the type of surgery, surgical time, blood loss ≥500 mL, and the presence or absence of urinary tract injury. All statistical analyses were conducted using IBM SPSS Statistics, version 29.0 (IBM Corp., Armonk, NY, USA).

Results

A total of 255 patients were initially identified from the cohort; 24 were excluded due to incomplete surgical records. The final analysis included 231 women who underwent prolapse surgery. Among them, 79 (34.19%) were aged ≥60 years, and 152 were included in the control group (<60 years). The mean age of the population was 54.39 years (minimum: 26 years), and the mean age of the ≥60 years group was 66.97 years (maximum: 85 years). Table 1 summarizes the demographic characteristics of the study population. Stage 2 symptomatic cystocele was the most common surgical indication; preoperative POP-Q staging and surgical procedures are summarized in Tables 2 and 3, respectively.

Preoperative data

General anesthesia was administered to 34 (14.7%) women, 177 (76.6%) received regional anesthesia, and 20 (8.7%) received a combination of regional and general anesthesia. There were no statistically significant differences between the age groups regarding the type of anesthesia. The mean surgical time was 172 minutes (range: 25-400 minutes), and the mean blood loss was 352 mL (range: 10-2500 mL).

In the <60 years group, the mean surgical time was 170 minutes, compared to 165 minutes in the ≥60 years group. Mean blood loss was 363 mL in the <60 years group and 329 mL in the ≥60 years group. No statistically significant differences were found between the two groups for these variables.

Table 1. Demographic characteristics of the population.

	Total	<60 years (n=152)	≥60 years (n=79)	p
Age, mean ± SD	54.3±10.9	47.8±6.2	66.9±5.7	
Pregnancies, mean ± SD	3.9±1.8	3.5±1.3	4.6±2.4	0.001
Vaginal birth	3.0±1.8	2.6±1.2	3.6±2.4	0.001
C-section	0.3±0.5	0.3±0.6	0.2±0.5	0.06
Child weight >4000 g, n (%)	44 (19)	27 (17)	17 (21)	0.48
Forceps vaginal delivery, n (%)	12 (5)	11 (7)	1 (1)	0.06
Previous vaginal surgery, n (%)	31 (13)	20 (13)	11 (13)	0.84
BMI, mean ± SD	28.2±4.1	28.5±4.2	27.7±3.9	0.16
Comorbidities, n (%)	90 (38)	48 (31)	42 (53)	0.002
DM	26 (11)	15 (9)	11 (13)	
Hypertension	30 (12)	14 (9)	16 (20)	
DM and hypertension	15 (6)	9 (5)	6 (7)	
Heart disease	2 (0.8)	0 (0)	2 (2)	
Hypothyroidism	13 (5)	10 (6)	3 (3)	
COPD	1 (0.4)	0 (0)	1 (1)	
Neuropathies	3 (1)	0 (0)	3 (3)	

SD, standard deviation; BMI, body mass index; DM, diabetes mellitus; COPD, chronic obstructive pulmonary disease.

Immediate surgical complications

Among the <60 years group, 51 (22.07%) experienced at least one of the studied complications. In comparison, 24 (10.38%) women ≥60 years had at least one complication. Age was not a significant risk factor for immediate complications (OR=0.864; 95% CI: 0.481-1.553).

The most frequent immediate complication was blood loss ≥500 mL, observed in 55 (23.81%) women overall. This was more common in the <60 years group (26.32%) than in the ≥60 years group (18.99%; adjusted OR=0.749; 95% CI: 0.361-1.557). Table 4 summarizes the type and frequency of each immediate surgical complication.

Postoperative urinary retention was also analyzed. Among women ≥60 years, 13 (16.4%) experienced urinary retention, compared to 16 (10.5%) in the <60 years group. Age was not a significant risk factor for urinary retention (OR=1.647; 95% CI: 0.761-

3.683). The need for indwelling urethral catheterization for ≥7 days was evaluated in patients who were unable to void or had post-void residual volumes >100 mL. In the ≥60 years group, 18 (22.7%) required prolonged catheterization, compared to 24 (15.78%) in the <60 years group. Age was not a significant risk factor (OR=1.574; 95% CI: 0.795-3.116).

A subgroup analysis was conducted for women aged ≥70 years (n=19). Of these, 5 (26.31%) had immediate complications (OR=0.724; 95% CI: 0.251-2.092). No statistically significant differences were observed. Rates of urinary retention and prolonged catheterization were also not significantly different in this subgroup.

Complications after 1-year follow-up

Complete 1-year follow-up data were available for 209 (90.4%) patients. Among them, 137 (68.5%) were <60 years, and

Table 2. Preoperative Pelvic Organ Prolapse Quantification stages.

POP-Q	Cystocele			Rectocele			Apical		
	<60 years	≥60 years	Total	<60 years	≥60 years	Total	<60 years	≥60 years	Total
Stage 0	10	5	15	33	17	50	15	6	21
Stage 1	6	11	17	97	53	150	31	17	48
Stage 2	115	53	168	19	6	25	89	44	133
Stage 3	20	8	28	3	2	5	14	11	25
Stage 4	1	2	3	0	1	1	3	1	4
	p=0.39	p=0.98	p=0.55						

POP-Q, Pelvic Organ Prolapse Quantification.

Table 3. Surgical procedures done.

	Total	<60 years	≥60 years	p
Hysterectomy	(n=143)	(n=99)	(n=44)	0.12
Vaginal	121	80	41	
Abdominal	13	12	1	
Laparoscopic	9	7	2	
POP surgery (multiple possible)	(n=202)	(n=122)	(n=80)	0.44
Anterior repair	45	36	9	
Posterior repair	38	31	7	
Anterior and posterior repair	90	45	45	
Obliterative	4	0	4	
Sacrospinous fixation	3	1	2	
Anterior mesh - UpHold™	14	5	9	
Posterior mesh	1	1	0	
Sacrocolpopexy	7	3	4	0.37
Mid-urethral slings	(n=182)	(n=124)	(n=58)	
TOT	153	107	46	
TVT	25	15	10	
TVT-O	3	1	2	
Mini sling	1	1	0	

POP, pelvic organ prolapse; TOT, trans-obturator tape; TVT, tension-free vaginal tape; TVT-O, tension-free vaginal tape-obturator approach.

Table 4. Number of immediate surgical complications presented.

	Total (n=231) n (%)	<60 years (n=152) n (%)	≥60 years (n=79) n (%)	aOR - Adjusted for type of surgery performed and surgical time
Blood loss ≥500 cc	55 (23.81)	40 (26.32)	15 (18.99)	0.749 (95% CI: 0.361-1.557)
Urinary tract infection	20 (8.66)	13 (8.55)	7 (8.86)	1.160 (95% CI: 0.433-3.109)
Postoperative pain	15 (6.49)	11 (7.24)	4 (5.06)	0.699 (95% CI: 0.212-2.307)
Urinary tract injury	9 (3.90)	6 (3.95)	3 (3.80)	1.452 (95% CI: 0.315-6.689)
Wound dehiscence	2 (0.87)	1 (0.66)	1 (1.27)	2.036 (95% CI: 0.114-36.379)

aOR, adjusted odds ratio; CI, confidence interval.

72 (34.4%) were ≥ 60 years. A total of 36 (17.22%) women < 60 years experienced complications after 1 year, compared to 27 (12.91%) in the ≥ 60 years. Age was not a risk factor for 1-year complications (OR=1.683; 95% CI: 0.914-3.099).

The most common complication after 12 months was de novo urgency, reported in 39 (16.88%) women. This occurred more frequently in the ≥ 60 years group (25.32%) compared with the < 60 years group (12.50%; adjusted OR=2.466; 95% CI: 1.188-5.118; $p=0.01$). Table 5 summarizes the number and percentage of each complication observed after 1 year.

A subgroup analysis was also performed for women ≥ 70 years ($n=16$). Complications were observed in 7 (43.7%) women in this group (OR=1.903; 95% CI: 0.676-5.359). No specific complication showed a statistically significant difference when compared to women < 70 years.

Discussion

Our study establishes the safety profile of pelvic reconstructive surgery in elderly women in a Latin American population. Data on this topic are scarce in the region. It is important to highlight the chosen age cutoff of 60 years for defining elderly women in our study.

While some international studies use older age thresholds (e.g., 65 or 70 years) to define elderly populations, the choice of ≥ 60 years in this study reflects the demographic and epidemiological realities of Latin America.⁶⁻⁹ In many LMICs, functional decline, multimorbidity, and restricted access to comprehensive preoperative care are more prevalent from the sixth decade of life.¹ Using this threshold allows for a more accurate characterization of surgical risk in real-world populations served by public health systems in the region. Importantly, our inclusion of a subgroup analysis of women aged ≥ 70 years further supports the robustness of our findings and acknowledges the heterogeneity within older adult groups.

Since surgery remains a primary treatment option, it is important to understand the potential complications of pelvic floor surgery in this population. Our findings suggest that most complications are mild and do not occur more frequently in elderly women compared to younger ones.

In our population, most women received regional anesthesia, in contrast to European studies where general anesthesia is preferred.⁶ No major anesthesia-related complications occurred, supporting the safety of both anesthesia approaches regardless of age. Our mean surgical time (172 minutes) was longer than in American and European studies,⁶⁻⁹ likely due to the performance of multiple

concurrent procedures and the teaching environment involving residents and fellows. More than half of the patients underwent vaginal hysterectomy ($n=121$), and 75% received a mid-urethral sling for stress incontinence ($n=182$). Although surgical time increased, no higher rates of immediate or delayed complications were observed, suggesting that performing multiple procedures simultaneously does not inherently increase risk.

Immediate surgical complications were classified using the Clavien-Dindo system.¹⁰ All complications were classified as grade I or II. No patients required reintervention, and none experienced organ failure or life-threatening events. Age was not associated with increased complication severity.

Obliterative procedures are often considered beneficial in elderly women due to reduced surgical time and blood loss.^{11,12} In our study, such procedures were reserved for highly selected cases. Their limited use did not lead to a higher complication rate in elderly patients.

While obliterative procedures are a safe option, age alone should not be the determining factor for their selection. Non-oblitterative approaches appear equally safe in elderly women. Given the functional limitations of obliterative procedures, they should be considered primarily in recurrent cases and with explicit patient consent. These results are consistent with those reported by a European group.⁶

It is encouraging for surgeons to see data supporting the safety of surgical management in elderly women, as no major complications were observed in this population. Interestingly, longer surgical times and greater blood loss were more common in younger women, albeit without statistical significance. Clinically, these findings suggest that surgeons may operate with greater caution in older women, potentially reducing intraoperative risks despite higher comorbidity rates.

The appearance of de novo urgency and urgency urinary incontinence in elderly women also warrants attention. Although not severe complications, they may have a meaningful impact on QoL, particularly in this age group, where genitourinary syndrome of menopause and comorbidities are prevalent. Future studies incorporating validated QoL instruments are needed to clarify the real clinical burden of these symptoms. Urgency is difficult to attribute solely to surgery, as aging and the genitourinary syndrome of menopause are major risk factors. Additionally, the placement of a mid-urethral sling may contribute to these symptoms.

In developing countries, performing multiple procedures in a single surgical session may offer practical and economic advantages. In our setting, simultaneous anti-incontinence and prolapse procedures did not increase complication rates and helped reduce overall costs for both hospitals and patients, many of whom pay out of pocket.

Table 5. Number of complications after 1-year follow-up.

	Total (n=231) n (%)	< 60 years (n=152) n (%)	≥ 60 years (n=79) n (%)	aOR - Adjusted for type of surgery, surgical time, blood loss ≥ 500 mL, and the presence or absence of urinary tract injury	p
De novo urinary urgency	39 (16.88)	19 (12.50)	20 (25.32)	2.466 (95% CI: 1.188-5.118)	0.01
De novo SUI	30 (12.99)	15 (9.87)	15 (18.99)	2.210 (95% CI: 0.994-4.915)	0.52
Voiding dysfunction	26 (11.26)	15 (9.87)	11 (13.92)	1.578 (95% CI: 0.669-3.721)	0.29
Vaginal bulging recurrence	24 (10.39)	13 (8.55)	11 (13.92)	1.659 (95% CI: 0.691-3.984)	0.25
De novo UII	19 (8.23)	8 (5.26)	11 (13.92)	3.083 (95% CI: 1.137-8.358)	0.02
Sling/mesh exposition	6 (2.60)	5 (3.29)	1 (1.27)	0.351 (95% CI: 0.038-3.262)	0.35

aOR, adjusted odds ratio; CI, confidence interval; SUI, stress urinary incontinence; UII, urgency urinary incontinence.

This study's strengths include short- and long-term follow-up and the ability to analyze a subgroup of women aged ≥ 70 years. In both analyses, no increase in complications was observed. Limitations include its retrospective design, 1-year follow-up duration, heterogeneity of surgical procedures, and the absence of QoL assessments.

These limitations should be addressed in future prospective studies. Despite the lack of statistical significance for some outcomes, the observed trends, such as higher rates of de novo urgency in older women, highlight the importance of considering functional status and patient-reported outcomes when counseling elderly patients on surgical options.

Prospective studies are needed to better understand surgical outcomes in elderly populations. Research on specific procedures could help identify the best approaches in terms of both objective and subjective success. Proper patient selection and comprehensive preoperative assessment are key to achieving optimal outcomes. Our findings align with international studies,⁶ demonstrating that surgery in elderly women can be safe and effective when patient selection is appropriate.

Despite limited data on this topic, increasing life expectancy and the rising prevalence of pelvic floor disorders make this an urgent area of study. Several authors have argued that pelvic floor surgery should not be restricted based on age.¹³ Chronological age alone should not exclude patients from surgical treatment. In most cases, surgery improves QoL and should be offered accordingly.

Finally, adequate training in pelvic floor surgery is essential to meet the needs of an aging female population. Delivering the best anatomical and functional outcomes is imperative for improving the QoL in these women, regardless of age. Our study did not find an increased risk of complications in elderly Latin-American women undergoing reconstructive pelvic surgery for POP.

Conclusions

In this Latin American cohort, age ≥ 60 years was not associated with increased surgical risk for POP reconstruction. These findings support the surgical management of POP in elderly women and highlight the need to base clinical decisions on functional status rather than chronological age.

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