Vaginal Ring Pessary Inserted by a Nurse for Pelvic Organ Prolapse in Chinese Women: A Prospective Study

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Objective: This study examined the efficacy and outcome of insertion of a vaginal ring pessary by a nurse in women with pelvic organ prolapse.
Methods: 96 women were prospectively recruited. Their demographics, urinary symptoms, and bowel function were evaluated. Grading of pelvic organ prolapse (using the Pelvic Organ Prolapse Quantification System), visual analogue scale on prolapse symptoms and voiding difficulty, validated pelvic floor distress inventory, pelvic floor impact questionnaire, patient decision on continuation of ring pessary use and satisfaction were recorded on the first visit and at three-month follow-up.
Results: The mean age of patients was 66.4 years. 78 (79.6%) of women were satisfied with the ring pessary; 15 (15.6%) discontinued ring pessary use. All urinary symptoms (urgency, urge incontinence, and voiding dysfunction) except for stress incontinence improved significantly. Quality of life also improved significantly.
Conclusion: Nurses can play an active role in conservative management for women with symptomatic pelvic organ prolapse.
Hong Kong J Gynaecol Obstet Midwifery 2017; 17(1):50-5

Keywords: Nursing staff, hospital/education; Pelvic organ prolapse; Pessaries

Introduction

Pelvic organ prolapse (POP) is defined as the descent of one or more of the following: anterior vaginal wall, posterior vaginal wall, and apex of vagina (cervix/uterus) or vault (cuff) following hysterectomy. Absence of prolapse is defined as stage 0, and prolapse as stages I to IV[1,2]. POP is common in women; its prevalence is 41.1% in the US[3] and 19.7% (range, 3.4-56.4%) in developing countries[4]. Women with POP usually also have urinary, bowel, or sexual symptoms, leading to distress and impaired quality of life[5,6].

Vaginal pessaries have been used to manage POP[7-10]. More than 86% of gynaecologists and 98% of urogynaecologists use pessaries daily for their patients[7,11]. Nurses can make a valuable contribution in the use of vaginal pessaries for POP and stress urinary incontinence[8,10].

According to the integral theory for irritative urinary symptoms (such as urgency, frequency and urge incontinence) in women, mechanical disturbance to the pelvic floor, particularly the pubo-urethral ligament, contributes to the irritative symptoms[12]. Thus, correction of the pelvic floor defect by either a ring pessary or surgery should be also curative of irritative symptoms[12].

This study aimed to review the efficacy and outcome of vaginal ring pessary inserted by a nurse, and the associated irritative urinary symptom improvement in women with POP.

Methods

All newly referred Chinese women without prior urogynaecological assessment who complained of symptomatic POP were recruited in a gynaecology nurse clinic (continence). Women who refused or were unable to give written consent, had cognitive impairment, pelvic inflammatory disease or were contraindicated to ring pessary insertion, for example suspected vaginal cancer, were excluded and referred to urogynaecologists. Eligible women were examined by vaginal speculum and digital examination to ensure that no abnormalities were detected. The ring pessary was inserted by one of two nurses who understood the assessment skill of the Pelvic Organ

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Prolapse Quantification System (POPQ), the indications for pessary use, the skills to safely fit, insert, and remove a pessary, and the complications associated with POP.

Data on demographics, urinary symptoms (urgency, stress urinary incontinence, urge urinary incontinence, and voiding difficulty), and bowel function (any constipation or incontinence) were collected. POP was graded using the POPQ as described by the International Continence Society[5]. Visual analogue scale (VAS) on prolapse and urinary difficulty, incontinence impact questionnaire-7 (IIQ7), and validated Chinese version of pelvic floor distress inventory (PFDI) and pelvic floor impact questionnaire (PFIQ)[13] were used to assess the type and severity of symptoms and the impact of different types of pelvic floor disorders on the woman's activities and wellbeing. PFDI comprises Urinary Distress Inventory (UDI), Pelvic Organ Prolapse Distress Inventory (POPDI), and Colorectal-Anal Distress Inventory (CRADI), whereas PFIQ comprises Urinary Impact Questionnaire (UIQ), Pelvic Organ Prolapse Impact Questionnaire (POPIQ), and Colorectal-Anal Impact Questionnaire (CRAIQ).

Ring pessary was the first-line conservative management. Data were collected at the first visit and then three-month follow-up. The women's decision on whether to continue ring pessary and her satisfaction were recorded at three-month follow-up. If the ring pessary had dislodged, a different size ring pessary was inserted after assessment.

Statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS Windows version 13). The McNemar test was used to analyse any change in urinary and bowel symptoms from baseline to three months after pessary insertion. Student's *t* test was used to analyse the mean difference in scores of VAS, IIQ7, PFDI, and PFIQ. The study was approved by the Research Ethics Committee under KCC/KEC and compliant with International Conference on Harmonisation Good Clinical Practice guidelines.

Results

Of 100 women recruited, three could not be contacted and one underwent surgery in the private sector. For the remaining 96 women, the mean age was 66.4 ± 9.4 (range, 41-84) years, and the mean number of vaginal deliveries was 2.9 ± 1.4 (range, 0-9). The mean weight of heaviest babies delivered was 3.3 ± 0.7 (range, 0-5) kg. 90 (93.8%) of women were post-menopausal and 10 (10.4%) had undergone hysterectomy (Table 1). According to the POPQ staging, 7.3%, 76%, and 16.7% of women had stage I, stage II, and stage III / IV POP, respectively (Table 2).

Almost all urinary symptoms and bowel symptoms improved significantly after three months of ring pessary ($p=0.022$ to $p<0.001$), except for stress urinary incontinence ($p=1$) and urgency ($p=0.064$). VAS scores for prolapse symptoms and voiding difficulty also improved significantly ($p<0.001$) [Table 3].

In PFDI, prior to ring pessary, distress was greater in prolapse symptoms than in urinary symptoms or colorectal-anal symptoms (POPDI: 69.3 ± 52.7 vs. UDI: 53.3 ± 41.1 vs. CRADI: 38.6 ± 43.67). After three months, the distress associated with prolapse symptoms remained higher than other symptoms (POPDI: 24.8 ± 34.8 vs. UDI: 22.4 ± 26.2

Table 1. Demographic and clinical characteristics (n=96)*

Characteristics	Data
Age (years)	66.4 ± 9.4 (41-84)
Vaginal delivery	2.9 ± 1.4 (0-9)
Heaviest baby delivered (kg)	3.3 ± 0.7 (0-5)
Menopause	90 (93.8)
Hysterectomy done	10 (10.4)

* Data are shown as mean ± standard deviation (range) or No. (%) of subjects

Table 2. Staging of prolapse according to Pelvic Organ Prolapse Quantification System*

	Stage 0	Stage I	Stage II	Stage III / IV
Anterior compartment prolapse	-	5 (5.2)	75 (78.1)	16 (16.7)
Middle compartment prolapse	2 (2.1)	48 (50)	33 (34.4)	13 (13.5)
Posterior compartment prolapse	43 (44.8)	27 (28.1)	22 (22.9)	4 (4.2)
Overall	-	7 (7.3)	73 (76)	16 (16.7)

* Data are shown as No. (%) of subjects

Table 3. Subjective assessment of urinary symptoms, bowel symptoms, and prolapse before and after ring pessary (n=96)

	Before insertion*	Three months after insertion*	p Value
Stress urinary incontinence	37 (38.5)	36 (37.5)	1.0
Urgency	73 (76)	24 (25)	0.064
Urge urinary incontinence	33 (34.4)	25 (25)	<0.001
Voiding difficulty	61 (63.5)	7 (7.3)	<0.001
Constipation	11 (11.5)	2 (2.1)	0.004
Faecal incontinence	15 (15.6)	6 (6.3)	0.022
Visual analogue scale on prolapse	6.5 ± 2.4	2.4 ± 2.7	<0.001
Visual analogue scale on voiding difficulty	4.5 ± 3.1	1.9 ± 2.3	<0.001

* Data are shown as No. (%) of subjects or mean ± standard deviation

vs. CRADI: 15.3 ± 24.9), although all symptoms improved significantly (p≤0.001, Table 4).

For the UDI domain, obstructive subscale score was higher than the irritative and stress subscale scores before and after ring pessary; all subscale scores improved significantly after three months (p≤0.001). For the POPDI domain, the general subscale score was highest and the posterior subscale score was lowest before ring pessary. After three months, the general subscale score remained highest but the posterior subscale score was higher than the anterior subscale score; all subscale scores improved significantly (p≤0.001). For the CRADI domains, obstructive subscale score was the highest, followed by incontinence, pain, and rectal subscale scores both before and after ring pessary; all subscale scores improved significantly after three months (p≤0.001).

In PFIQ, prior to ring pessary, prolapse symptoms had a greater impact on quality of life than urinary symptoms and colorectal-anal symptoms (POPIQ: 60.1 ± 81.8 vs. UIQ: 44.9 ± 74.4 vs. CRAIQ: 19.6 ± 63.7). After three months, urinary symptoms had a greater impact on quality of life than prolapse symptoms and colorectal-anal symptoms (UIQ: 22.8 ± 47.7 vs. POPIQ: 15.4 ± 37.0 vs. CRAIQ: 3.0 ± 14.4). All domains improved significantly after three months (p=0.007 to p≤0.001).

For the UIQ domains, physical activity subscale score was highest, followed by emotion, travel, and social subscale scores before ring pessary. After three months, physical activity subscale score remained highest, followed by travel, emotion, and social subscales; all subscales improved significantly (p=0.001 to p≤0.001). In the POPIQ domains, physical activity subscale score was the highest, followed by emotion, travel, and social subscale scores before ring pessary. After three months, physical activity subscale score remained highest, followed by travel, emotion, and social subscale scores. All subscale scores improved significantly (all p≤0.001). In the CRAIQ domains, travel subscale score was highest, followed by physical, emotion, and social subscale scores before ring pessary. After three months, travel subscale score remained highest, followed by physical, social, and emotion subscale scores. All subscale scores improved significantly (p=0.024 to p=0.011).

15 (15.6%) women discontinued with the use of ring pessary owing to increased urinary incontinence (n=1, 6.7%), dislodgement (n=7, 46.7%), or self-removal of the ring pessary because of stretching discomfort (n=7, 46.7%). No woman encountered vaginal ulceration, voiding or defecation difficulty. The mean size of ring pessary used was 64.43 ± 5.5 mm; two women change to a double-ring pessary following reassessment. Overall, 78 (79.6%) women were satisfied with vaginal ring pessary treatment; 28 (29.2%) opted for surgery despite being satisfied.

Discussion

In this study, 81 (84.4%) of women were successfully fitted with a ring pessary and opted to continue its use after three months. The success rate is similar to that reported in other studies (64 to 85%)[14-16]. 78 (79.6%) of women were satisfied with the ring pessary; the satisfaction rate is also similar to that reported in other studies (70 to 93%)[15,17,18]. The reasons for discontinuation of ring pessary use have been

Table 4. Pelvic Floor Distress Inventory (PFDI) and Pelvic Floor Impact Questionnaire (PFIQ) scoring before and after ring pessary

Outcome measure	Before insertion*	Three months after insertion*	p Value
PFDI†			
UDI total	53.3 ± 41.1	22.4 ± 26.2	<0.001
UDI obstructive	23.2 ± 16.9	7.7 ± 10.6	<0.001
UDI irritative	17.8 ± 15.6	7.5 ± 9.9	<0.001
UDI stress	12.3 ± 14.3	7.1 ± 9.5	<0.001
POPDI total	69.3 ± 52.7	24.8 ± 34.8	<0.001
POPDI general	30.5 ± 19.2	10.9 ± 14.1	<0.001
POPDI anterior	20.7 ± 20.2	6.4 ± 11.0	<0.001
POPDI posterior	18.1 ± 20.6	7.6 ± 13.6	<0.001
CRADI total	38.6 ± 43.67	15.3 ± 24.9	<0.001
CRADI obstructive	18.1 ± 20.5	7.56 ± 13.6	<0.001
CRADI incontinence	8.4 ± 12.7	4.1 ± 8.0	<0.001
CRADI pain	7.3 ± 11.0	2.9 ± 6.2	<0.001
CRADI rectal	4.8 ± 13.0	0.8 ± 4.4	0.001
PFIQ‡			
UIQ total	44.9 ± 74.4	22.8 ± 47.7	0.001
UIQ travel	12.4 ± 21.6	6.8 ± 15.1	0.001
UIQ social	7.4 ± 14.9	3.4 ± 9.2	0.002
UIQ emotion	12.5 ± 20.7	4.6 ± 11.3	<0.001
UIQ physical	44.5 ± 73.7	7.1 ± 15.5	<0.001
POPIQ total	60.1 ± 81.8	15.4 ± 37.0	<0.001
POPIQ travel	16.1 ± 24.2	4.7 ± 14.5	<0.001
POPIQ social	7.8 ± 16.4	2.1 ± 7.4	<0.001
POPIQ emotion	16.2 ± 23.2	3.2 ± 9.0	<0.001
POPIQ physical	20.0 ± 26.1	5.4 ± 13.1	<0.001
CRAIQ total	19.6 ± 63.7	3.0 ± 14.4	0.007
CRAIQ travel	6.3 ± 19.2	1.1 ± 6.0	0.024
CRAIQ social	3.6 ± 13.1	0.6 ± 3.0	0.014
CRAIQ emotion	4.2 ± 14.8	0.4 ± 2.2	0.015
CRAIQ physical	5.6 ± 18.7	0.9 ± 5.3	0.011

* Data are shown as mean ± standard deviation

† PFDI comprises Urinary Distress Inventory (UDI), Pelvic Organ Prolapse Distress Inventory (POPDI), and Colorectal-Anal Distress Inventory (CRADI); a higher PFDI subscale score indicates more bothersome symptoms

‡ PFIQ comprises Urinary Impact Questionnaire (UIQ), Pelvic Organ Prolapse Impact Questionnaire (POPIQ), and Colorectal-Anal Impact Questionnaire (CRAIQ); a higher PFIQ subscale score indicates poorer quality of life

reported to be dislodgement (45%) and discomfort (35%)[15]. Non-surgical treatment is popular initial management, especially for older women and those with less severe anatomic prolapse[13,19]. Nonetheless, the median duration of vaginal pessary use is usually about seven years[20]. In our study, 29.2% of women opted for surgery after three months, some preferred a more definitive treatment, some had more urinary incontinence after ring pessary, and some felt uncomfortable with the increase in vaginal discharge.

Urinary symptoms (urge urinary incontinence and voiding difficulty) improved significantly after ring pessary. This could be due to rectification of pelvic floor defect that corrected the secondary urge urinary incontinence related

to pelvic organ prolapse, that in turn also corrected the associated anatomical distortion of the urethra that resulted in voiding difficulties[12,21]. The overall improvement in voiding difficulty was significant and comparable with other studies[17,21], although improvement in urgency was not significant. For stress urinary incontinence, occult stress incontinence may worsen, as the ring pessary actually supports the prolapsed vagina[13,17]. Nonetheless, the incidence of stress incontinence was not increased probably due to the relatively small sample size. For bowel symptoms, both constipation and faecal incontinence improved significantly due to anatomical correction in the posterior compartment, consistent with other study[19].

Regarding distress symptoms in the POPDI domain, before ring pessary, the anterior subscale score was higher than the posterior subscale score, as most women had stage II POP and more had anterior compartment prolapse. After ring pessary, the posterior subscale score was higher than the anterior subscale score, probably because the ring pessary could correct anterior compartment prolapse better than posterior compartment prolapse.

Regarding quality of life, before ring pessary, the POPIQ score was higher than UIQ and CRAIQ scores, as women regarded prolapse symptoms more bothersome than urinary symptoms. After ring pessary, UIQ score became higher than POPIQ and CRAIQ scores, as urinary incontinence could become dominant after correcting the prolapse. The disturbance from increasing urinary incontinence was also reflected in the travel subscale in UIQ, POPIQ, and CRAIQ. All scores in travel subscales were higher than those in social, emotion, and physical subscales after ring pessary insertion.

In this cohort, two women changed to a double ring pessary following reassessment as prolapse persisted. Use of a double ring pessary has been described in women with advanced prolapse who are unsuitable for surgical correction or in whom a single ring pessary has failed[22,23].

Self-management of ring pessary usage, including regular removal and replacement, is common in other countries[8,10,16]. It serves a hygienic purpose, allows for more convenient sexual activity, and prevents complications such as ulcer formation. Nonetheless, it depends on the willingness of the individual woman and the time required by health care professionals to teach the technique.

Conclusion

Nurses can play an active role in conservative management for women with symptomatic POP. They can teach such women self-management of a ring pessary to improve the quality of life. Longer-term efficacy of the ring pessary under the care of a nurse or the woman should be investigated in future studies.

Declaration

The authors have declared no conflict of interests in this study.

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