



Contents lists available at ScienceDirect

Gynecology and Minimally Invasive Therapy

journal homepage: www.e-gmit.com

Original article

The choice of reoperation after primary surgeries for uterine prolapse: A nationwide study

Ming-Ping Wu^{a, b, *}, Chia-Jen Wu^c, Shih-Feng Weng^{d, e}^a Division of Urogynecology and Pelvic Floor Reconstruction, Department of Obstetrics and Gynecology, Chi Mei Medical Center, Tainan, Taiwan^b Center of General Education, Chia Nan University of Pharmacy and Science, Tainan, Taiwan^c Department of Obstetrics and Gynecology, Chi Mei Medical Center, Liou-Ying, Tainan, Taiwan^d Department of Medical Research, Chi Mei Medical Center, Tainan, Taiwan^e Department of Hospital and Health Care Administration, Chia Nan University of Pharmacy and Science, Tainan, Taiwan

ARTICLE INFO

Article history:

Received 12 January 2015

Accepted 15 January 2015

Available online 18 February 2015

Keywords:

hysterectomy

hysteropexy

National Health Insurance Research

Database (NHIRD)

uterine preservation

uterine prolapse

ABSTRACT

Objective: Our previous study described the increasing adoption of uterine-preserving procedures in the surgical approach for uterine prolapse. In this follow-up study, we further explored the reoperation rate and variables for the choice of surgeries after primary uterine prolapse surgery, based on the nationwide claim data in Taiwan.

Materials and methods: The data of this study was obtained from the Inpatient Expenditures by Admission files of the National Health Insurance Research Database (NHIRD). Women who received primary and repeat surgeries, either hysteropexy or hysterectomy, were identified between 1997 and 2010; and followed up to 2010 or till the event of reoperation. We analyzed the variables including the primary surgical type, concomitant stress urinary incontinence (SUI) surgery, patient age, surgeon age, and hospital accreditation level.

Results: Among the total 36,609 women, a higher reoperation rate was noted in the hysteropexy group (156/4095) (3.81%) than in the hysterectomy group (116/32,514) (0.36%); the adjusted odds ratio (OR) was 11.70 [95% confidence interval (CI): 8.86–15.43]. It was lower in patients with concomitant SUI surgery; older patients (aged ≥ 60 years and 40–69 years vs. < 40 years); older surgeons (aged ≥ 50 years and 40–49 years vs. < 40 years), but not significant in hospital levels. Hysterectomy was the preferred choice as compared with repeat hysteropexy (69.87% vs. 30.13%) among the failed hysteropexy group. All variables for the choice of repeat hysteropexy were not significant.

Conclusion: Our study offers a population-based nationwide observation that hysteropexy correlates with a higher reoperation rate, as compared with hysterectomy; but it is still as high as 30% in the surgical choice of the failed hysteropexy group.

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Introduction

Uterine prolapse, an apical defect of pelvic organ prolapse (POP), is a commonly encountered women's health issue with a negative impact on a patient's quality of life.¹ The lifetime risk of undergoing prolapse or continence surgery is 11.1%,² which increases as the life expectancy increases. The number of surgeries for urinary incontinence and POP will increase substantially over the next 40 years

according to a forecasting study.³ Traditionally, repair of POP with a concomitant hysterectomy is considered the “standard of care” for uterovaginal prolapse. As early as 1934, Bonney⁴ suggested that descent of the uterus is the consequence, and not the cause, of uterine prolapse. The pathological cause of uterine prolapse is loss of integrity of the uterosacral and cardinal ligament complex and a weakening of the pelvic floor diaphragm.⁵ Uterine prolapse can result from any defect of the following: the constriction of the bottom of the vagina, the suspension of the uterosacral and cardinal ligament, and flap valve closure against the pelvic wall; hence, removing the uterus to treat POP does not appear logical.⁴ Therefore, whether hysterectomy remains as the “standard of care” in modern gynecologic practice remains debatable. Moreover, women

Conflicts of interest: All authors declare that there are no conflicts of interest.

* Corresponding author. Department of Obstetrics and Gynecology, Chi Mei Foundation Hospital, Number 901, Chung Hwa Road, Yung Kang, Tainan, 710, Taiwan.

E-mail address: mpwu@mail.chimei.org.tw (M.-P. Wu).

<http://dx.doi.org/10.1016/j.jgmit.2015.02.002>

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opted to preserve the uterus for reasons such as the desire to maintain future fertility, the belief that the uterus affects sexual function or sense of identity, an increase in conservative treatment for menorrhagia, concern about the risks of hysterectomy, and the length of recuperation.⁶

Our previous study described the changing trends of surgical approaches for POP in Taiwan, and presented an account of the increasing use of hysteropexy with uterine preservation during recent years.⁷ Although POP is often considered a condition of the elderly, a national census and survey in the United States reported the surgical distribution rates according to age group: prolapse surgical rates (per 10,000 women) were seven, 24, 31, and 17 in reproductive age, perimenopausal, postmenopausal, and elderly age groups, respectively.⁸ It suggests that POP is a condition affecting women across the reproductive life cycle and for which women of all ages seek surgical treatment. In recent years, interest in uterine preservation has been growing worldwide. According to a recent multicenter, cross-sectional study, a higher proportion of women with symptomatic prolapse preferred to retain the uterus at the time of surgery in the absence of a substantial benefit of hysterectomy.⁹ Today, more uterus-preserving procedures are used to treat POP; uterine preservation is now feasible during pelvic reconstructive surgeries.^{10,11} After our initial observation of an increasing use of hysteropexy with uterine preservation in treating uterine prolapse, we further explored the reoperation rates and the variables of surgical type, either hysterectomy or hysteropexy, for the failed primary surgery for uterine prolapse; also, we tried to identify the variables of the choices of repeat hysteropexy among the failed hysteropexies, based on the National Health Insurance (NHI) claims data.

Materials and methods

Data source

The data used in this study were obtained from the National Health Insurance Research Database (NHIRD). The NHIRD was established by the National Health Research Institute, in cooperation with the NHI Bureau, with the aim of undertaking research into current and emerging issues in Taiwan. The details of the NHIRD were described in our previous report.⁷ Briefly, NHIRD offered the information of NHI-reimbursed hospital discharges on inpatient characteristics, the dates of admission and discharge, the type of disease, and the surgery code (based upon the International Classification of Diseases, 9th Revision, Clinical Modification, ICD-9-CM). Anonymous identifiers of the medical institutions and physicians were used to link the hospital discharge data to the physician and hospital registries. Confidentiality assurances were ensured abiding by data regulations of the NHI Bureau. We consulted with the Institutional Review Board of Chi Mei Foundation Hospital, Tainan, Taiwan and obtained a formal written waiver for the need of ethics approval (No. 10202-E08).

Study participants

Study participants were women who had NHI and received primary surgeries, either hysteropexy with uterine preservation, or hysterectomy with/without colpopexy, due to the diagnosis of uterine prolapse in Taiwan between January 1, 1997 and December 31, 2010. A diagnosis of uterine prolapse included ICD-9 CM diagnosis codes 618.1 for uterine prolapse without mention of vaginal wall prolapse; 618.2 for uterovaginal prolapse, incomplete; 618.3 for uterovaginal prolapse, complete; and 618.4 for uterovaginal prolapse, unspecified, but not vaginal vault prolapse (618.5 prolapse of the vaginal vault after a hysterectomy). The surgical

approaches received by the women for uterine prolapse were categorized as follows: (1) hysteropexy with uterine preservation (hysteropexy group): ICD-9 CM operation code 69.22 for other uterine suspension, including a hysteropexy, Manchester operation, and plication of uterine ligament; and (2) hysterectomy with/without colpopexy (hysterectomy group): ICD-9 CM operation code 70.77 for vaginal suspension and fixation. A concomitant hysterectomy included any of the following: a subtotal (supracervical) abdominal hysterectomy (SAH; 68.3); a total abdominal hysterectomy (TAH; 68.4); laparoscopic hysterectomy (LH; 68.51, or 68.5 vaginal hysterectomy with 54.21 laparoscopy); and a vaginal hysterectomy (VH; 68.59, or 68.5 vaginal hysterectomy without 54.21 laparoscopy). A concomitant stress urinary incontinence (SUI) surgery was described as plication of the urethra-vesical junction, e.g., a Kelly-Kennedy operation (59.3); a suprapubic sling operation, e.g., Goebel-Frangenheim-Stoeck suspension (59.4); retropubic urethral suspension, e.g., a Marshall-Marchetti-Kranz (MMK) operation, Burch procedure (59.5); paraurethral suspension (needle suspension), e.g., Pereyra suspension (59.6); injection of an implant into the urethral and/or bladder neck, e.g., collagen implant (59.72); and others (59.79), e.g., abdominal perineal urethral suspension (APUS), midurethral sling, etc.

Thereafter, we followed these women until the event of reoperation after failed primary surgery or the end of 2010. The women receiving repeat surgeries after failed primary surgery for a uterine prolapse were further categorized into either repeat hysteropexy or hysterectomy as a treatment modality; while colpopexy (vaginal suspension) was the only treatment of the failed hysterectomy group. The failure (reoperation) rate was defined as the proportion of repeat surgery (i.e. failed surgeries and need repeat surgery), over primary surgery.

Variable definitions

We identified the variables including primary surgical type, concomitant SUI surgery, patient age, surgeon age, surgeon gender, and hospital accreditation level. The variables used in this study fell into the following categories: (1) primary surgical type, either hysterectomy with/without colpopexy, or hysteropexy with uterine preservation; (2) concomitant SUI surgery; (3) patient age, which was divided into three age groups, i.e., < 40 years, 40–59 years, and ≥ 60 years of age; (4) surgeon characteristics (age and gender), the surgeon's age was divided into three groups, < 40 years, 40–49 years, and ≥ 50 years; and (4) hospital accreditation levels, the hospitals are accredited by the Taiwan Joint Commission on Hospital Accreditation (TJCHA) which is supervised by the Department of Health, Executive Yuan (Taiwan), and classified into three levels (medical centers, regional hospitals, and local hospitals) based on health care quality, medical teaching ability, clinical capabilities, and bed capacity.⁷

Statistical analysis

Chi-square tests were performed to examine differences in the repeat surgery distribution of the two types of surgeries. The Student *t* test was performed to examine the interval between the primary and repeat surgery of the two types of surgeries, hysterectomy or hysteropexy. A crude and multiple logistic regression were used to examine the independent effects of each individual variable for the failed surgeries for uterine prolapse, i.e., primary surgical type (hysteropexy or hysterectomy), concomitant SUI surgery, patient age, surgeon age and gender, and hospital accreditation level. The comparison of variables of the choices of repeat hysteropexy among the failed hysteropexy group was also performed. The significance of the statistics was determined using

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