

Comparison of Outcomes between Burch Colposuspension with and without Concomitant Abdominal Hysterectomy

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A total abdominal hysterectomy may cause a postoperative vesicourethral dysfunction due to an injury to the pelvic nerves. However, many incontinent women with benign diseases of the uterus and its adnexae have undergone a Burch colposuspension with a concomitant abdominal hysterectomy. This study was undertaken to compare the outcomes of a Burch colposuspension performed alone with that of a Burch with a concomitant abdominal hysterectomy.

This study included 132 women, who, were treated for primary urinary incontinence from February 1999 to February 2002 and were diagnosed with stress urinary incontinence by means of the urodynamic test at the Department of Obstetrics and Gynecology at Yonsei University Hospital. Forty-two women underwent a Burch colposuspension alone (Burch group) and 90 women underwent a Burch colposuspension with a concomitant abdominal hysterectomy (hysterectomy group). Between the Burch and hysterectomy groups, the mean age, parity, menopausal rate, Hormone Replacement Therapy (HRT) rate, 1 year follow-up outcomes and postoperative complications were compared using the subjective and objective stress tests according to the retrospective chart review.

The mean age (54.6 ± 0.5 vs 58.6 ± 9.2 years, $p=0.382$), parity (3.3 ± 1.2 vs 3.6 ± 1.7), menopausal rate (71.4 vs 77.7%), or HRT rate (23.3 vs 11.2%) of the two groups were similar. Complications related to surgery were encountered in 5 patients (11.9%) in the Burch group and in 7 patients (7.8%) in the hysterectomy group ($p=0.842$). One year follow-up subjective symptoms were encountered in 2 patients in the Burch group and in 4 patients in the hysterectomy group ($p=1.00$). The stress test was positive in only one patient in the hysterectomy ($p=1.00$). No significant difference was observed in the 1 year follow-up outcomes, which were 91.4% (32/35 patients) in the Burch and 91.2% (73/80) in the hyster-

ectomy groups.

The results showed that there were no adverse effects on the 1 year follow-up outcomes or complications in patients who underwent a Burch colposuspension with an abdominal hysterectomy.

Key Words: Burch colposuspension, total abdominal hysterectomy

INTRODUCTION

Genuine stress urinary incontinence is defined as the involuntary loss of urine when the intravesical pressure exceeds the maximum urethral closure pressure in the absence of detrusor activity. Its main causes are known to be urethral hypermobility and intrinsic sphincter deficiency.¹ A diagnosis is based on the patient's subjective symptoms as well as objective procedures such as stress or urodynamic tests. Depending on the severity of the symptoms and the objective signs either conservative treatment or surgery is used. The Burch colposuspension procedure, which is known to produce good results and have few complications, compared with other anti-incontinence surgical procedures, has been widely used since 1960.^{2,3}

However, some patients with stress urinary incontinence have benign gynecological diseases, including uterine leiomyoma. Because some authors have reported that the results of a Burch colposuspension with a hysterectomy are superior to those of the Burch colposuspension procedure performed alone,⁴ a Burch colposuspension with a hysterectomy has been widely performed in cases where there was also a requirement to perform a hysterectomy. Meanwhile, doubts have

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been cast on the safety of the hysterectomy procedure, because Hanley reported that a bladder and urethral dysfunction occurred after a total abdominal hysterectomy⁵ prompting further investigation into this problem. Snooks et al. and Parson and Turton reported that pelvic nerve injuries, resulting from a wide dissection, caused a lower urinary tract dysfunction in cases of a total abdominal hysterectomy,^{6,7} and Parys et al. demonstrated that a pelvic nerve injury occurred after an abdominal hysterectomy using the sacral reflex latencies. This supported the theory that an abdominal hysterectomy had an adverse effect on the lower urinary tract.⁸

Given the existence of such negative results, it is important to determine if a Burch colposuspension with an abdominal hysterectomy influenced the outcome of anti-incontinence surgery in patients with stress urinary incontinence. After comparing the outcomes of a Burch colposuspension performed alone with those of a Burch colposuspension and an abdominal hysterectomy, Langer et al insisted that a concomitant abdominal hysterectomy did not influence the postoperative bladder and urethral function.⁹ However, Farghaly et al. reported that an abdominal hysterectomy had a negative effect on the pelvic nerve and that it caused a postoperative voiding dysfunction in the case of a Burch colposuspension with an abdominal hysterectomy.¹⁰

Until now, a total abdominal hysterectomy has most frequently been performed as a surgical treatment for benign gynecologic diseases. Furthermore, many patients with stress urinary incontinence, who underwent a Burch colposuspension, had concomitant benign gynecologic diseases that required a hysterectomy. For this reason, a Burch colposuspension with a hysterectomy is still a widely used procedure.

Many studies have attempted to compare the outcomes, complication rates and postoperative voiding dysfunction between a Burch colposuspension and a Burch colposuspension with a hysterectomy, but there is a paucity of acceptable data on complication and cure rates.

Therefore, the aim of this study was to objectively compare the surgical outcomes and complication rates between cases of Burch colposuspension performed alone and those who un-

derwent a Burch colposuspension with a hysterectomy.

MATERIALS AND METHODS

The study population consisted of 132 patients who had undergone a Burch colposuspension (Burch group) or a Burch colposuspension with an abdominal hysterectomy (hysterectomy group), due to stress urinary incontinence, or due to benign gynecologic diseases after being diagnosed with stress urinary incontinence by a urodynamic study, at the urogynecology clinic, Yonsei university Medical Center, between February 1999 and February 2002. Forty-two patients underwent a Burch colposuspension alone and 90 patients underwent a Burch colposuspension with an abdominal hysterectomy. The indications for a hysterectomy were uterine leiomyoma or adenomyosis accompanied by chronic pelvic pain. All the patients were assessed using a standard history evaluation, a physical examination and a urodynamic study.¹¹ The standardized questionnaire included age, parity, menopause, Body Mass Index (BMI)(kg/m²), the presence of underlying diseases, past surgery history and the use of Hormone Replacement Therapy (HRT). This study analyzed the duration of surgery, the length of admission, the number of days required for the suprapubic catheter removal and the postoperative complications. Stress urinary incontinence was defined as being present when urine leakage occurred during stress without a detrusor contraction. The underlying diseases, which might increase the risk of postoperative complications, included Diabetes Mellitus (DM), hypertension, thyroid disease and Chronic Obstructive Pulmonary Disease (COPD). The previous surgical history included an abdominal hysterectomy, a vaginal hysterectomy and posterior colporrhaphy. The Foley catheter was removed at postoperative 5 days and the suprapubic catheter was removed when the residual urine was $\leq 1/5$ of the total urine volume. Those patients with detrusor instability, urinary tract infections or pelvic organ prolapse beyond stage II were excluded. The Institutional Review Board at Yonsei Medical Center approved this study. The urodynamic

studies (Dantec-5000, Copenhagen, Denmark) included uroflowmetry, multi-channel cystometry, urethral pressure profilometry and measurements of the Valsalva leak point pressure. The Valsalva leak point pressures were determined at bladder volumes of 200 mL using a 7Fr catheter. Urethral pressure profilometry was performed with a 7Fr catheter equipped with a transducer. The intra-abdominal pressure was measured transvaginally and at the moment when the patient first expressed a desire to void in the absence of a detrusor contraction. The patients were followed up at 1, 3, 6 and 12 months after surgery and their surgical outcomes were analyzed at postoperative 1 year by a subjective questionnaire (urinary frequency, leakage, urgency and voiding difficulty) and an objective urodynamic test. All the data of this study was obtained according to retrospective chart review.

A Student t-test and Chi-square test were used for statistical analysis (SPSS software, SPSS INC, Chicago, IL, USA). A *p* value of ≤ 0.05 was considered significant. Unless otherwise stated, all the terminology conforms to the recommendations of the International Continence Society.¹²

RESULTS

There were no significant differences in the mean age, BMI, menopausal rate, HRT rate or the underlying disease rate between the Burch group and the hysterectomy group (Table 1). The parity was significantly higher in the hysterectomy group (3.3 ± 1.2 vs 3.6 ± 1.7 , $p=0.006$, respectively) and the surgery history rate was significantly higher in the Burch group (52.4 vs 95.6%, $p=0.000$, respectively)(Table 1). The underlying diseases were DM, thyroid disease and COPD. There were no significant differences found in the length of admission, the number of days required for the removal of the suprapubic catheter, the self-voiding rate 5 days after removing the Foley catheter or the complication rates between the two groups (Table 2). The operation duration was shorter in the Burch group (127.1 ± 49.9 vs 169.2 ± 32.1 days, $p=0.003$, respectively)(Table 2). The complications encountered in the Burch group were wound infections, rectocele and incisional hernia. In the hysterectomy group the complications encountered were wound infections and hematuria (Table 3).

Table 1. Demographic Characteristics in the Burch and Hysterectomy Groups

	Burch group (N=42)	Hysterectomy group (N=90)	<i>p</i> value
Age (years)	54.6 ± 10.5	58.6 ± 9.2	0.382
Parity	3.3 ± 1.2	3.6 ± 1.7	0.006
BMI (kg/m ²)	24.5 ± 2.7	24.2 ± 2.7	0.675
Menopause			
Yes	30 (71.4%)	70 (77.7%)	0.133
No	12 (28.6%)	20 (22.3%)	
HRT			
Yes	7 (23.3%)	8 (11.2%)	0.138
No	35 (76.7%)	82 (98.8%)	
Underlying disease			
Yes	12 (28.5%)	32 (35.5%)	0.552
No	30 (71.5%)	58 (74.5%)	
Operation history			
No	22 (52.4%)	86 (95.6%)	0.000
TAH	12 (28.5%)	-	
VH	3 (7.2%)	-	
Colporrhaphy	5 (11.9%)	4 (4.4%)	0.142

BMI, body mass index; HRT, hormone replacement therapy; TAH, total abdominal hysterectomy; VH, vaginal hysterectomy. N=132.

Table 2. Perioperative comparison of the Burch and Hysterectomy groups

	Burch group (N=42)	Hysterectomy group (N=90)	p-value
PPD (days)	8.3 ± 4.5	9.3 ± 8.0	0.327
Operation time (minutes)	127.1 ± 49.9	169.2 ± 32.1	0.003
Supra-cath. R (days)	5.9 ± 3.8	6.3 ± 2.6	0.496
Self-voiding			
Yes	29 (69.0%)	81 (61.4%)	0.252
No	13 (31.0%)	9 (38.6%)	
Complication	5 (11.9%)	7 (7.8%)	0.842

PPD, postoperative day; Supra-cath. R, suprapubic catheter removal day.

Table 3. Postoperative Complications in the Burch and Hysterectomy Groups

	Burch group (N=42)	Hysterectomy group (N=90)
Wound infection*	3	6
Rectocele* [†]	1	-
Incisional hernia	2	-
Hematuria [‡]	-	1
Total	5	7

*concomitant occurrence in one patient.

[†]occurred in postoperative 6month.

[‡]occurred in postoperative 3 month and improved spontaneously.

Table 4. Postoperative 1 Year Follow-up

	Burch group (N=35)	Hysterectomy group (N=80)	p value
Subjective*			
Yes	2	5	1.0
No	33	75	
Objective [†]			
Yes	3	7 [§]	1.0
No	32	73	
Outcome [‡]	32/35 (91.4%)	73/80 (91.2%)	

*frequency and/or urgency.

[†]if urine leakage, stress test(+).

[‡]neither the subjective symptom nor positive objective test.

[§]the patient had the subjective symptom too.

N=115.

One hundred and fifteen patients were followed up at postoperative 1 year, including 35 patients in the Burch group and 80 patients in the hysterectomy group. The subjective cure rates were 94.3% (33/35) and 93.8% (75/80), respectively, ($p=1.00$) (Table 4). The objective cure rates were 91.4% (32/35) and 91.2% (73/80), respectively (Table 4).

DISCUSSION

Age, parity, a previous hysterectomy and menopause are known to be the primary risk factors for genuine stress incontinence.^{13,14} Some authors have insisted that a Burch colposuspension with a hysterectomy causes pelvic nerve injury and has

an adverse effect on the success rate of anti-incontinence surgery.⁶⁻¹⁰

For the reasons described above, this study made an objective comparison of the cure and complication rates between the Burch and the hysterectomy groups. In this study, the cure rates and complication rates were similar in the two groups. This result is similar to those reported by Langer et al.⁹ and Meltomaa et al.¹⁵ These authors insisted that a Burch colposuspension with a hysterectomy did not influence the cure rate of a Burch colposuspension. These results contradict those reported by Snooks et al.⁶ and Parson et al.,⁷ who showed that an abdominal hysterectomy caused pelvic nerve injury and had an adverse effect on the function of the lower urinary tract.

There are several explanations for the results in this study. First, the Burch colposuspension with an abdominal hysterectomy might not necessarily cause pelvic nerve injury. Some authors believed that pelvic nerve injury occurred frequently near the uterine artery, bladder base and parametrium, because of the wide dissection that is made in this area during an abdominal hysterectomy.¹⁶ However, the pelvic nerve around the uterine artery, bladder base and parametrium are not usually injured during an abdominal hysterectomy because no such wide dissection of the parametrium or posterior lateral tissue of the uterine cervix is made.¹⁷ Therefore, pelvic nerve injury can be prevented if a gynecologist performs an abdominal hysterectomy skillfully. Consequently, this procedure will not influence the function of the lower urinary tract. Second, the observed postoperative voiding dysfunction may not be the result of a pelvic nerve injury, but be due to some other factors. Farghaly et al. reported that a postoperative voiding dysfunction might have occurred as a result of a postoperative bladder change, improper bladder drainage or an urinary tract infection.¹⁰ This means that the proper bladder drainage and the prevention of a urinary tract infection can reduce the risk of a postoperative voiding dysfunction. Furthermore, postoperative voiding difficulties might be due to an edema of the bladder base and pelvic floor tissue, in which case these difficulties would most probably disappear without any particular treatment within 2 weeks.¹⁷ In this study, 13 patients (31.0%) who

had undergone the Burch colposuspension and 9 patients (38.6%) who had undergone the Burch colposuspension with a hysterectomy group failed to void immediately after removing the Foley catheter. However, all of these patients voided spontaneously within 2 weeks without any treatment. Third, the effects of benign gynecological diseases need to be considered. Uterine leiomyoma and adenomyosis can compress the bladder directly, leading to a reduction in the bladder capacity, and sometimes increasing urinary frequency, urgency, incontinence and an increase in the residual urine, through changing the anatomical configuration of the pelvic floor.¹⁸ Therefore, when patients have urinary incontinence with a pelvic mass, the risk of an increased urinary frequency, urgency, residual urine and incontinence would be higher if a Burch colposuspension without hysterectomy were to be performed. Accordingly, a Burch colposuspension with a hysterectomy for those patients who have urinary incontinence with a pelvic mass is beneficial for the treatment of urinary incontinence.

In this study, the postoperative complications rates were 11.9% and 7.8% in the Burch colposuspension and the Burch colposuspension with a hysterectomy groups, respectively. However, this difference was not significant. The most common complication in both groups was a wound infection; 3 cases (60%), and 6 cases (85%), respectively. One case of rectocele occurred in the Burch group, which might have been the result of a wide exposure of the cul-de-sac after a bladder neck suspension. Two cases of an incisional hernia occurred in the Burch group, but these incidents were not directly related to the Burch colposuspension procedure itself.

In this study, both a subjective questionnaire and objective stress and urodynamic tests were used to evaluate the success rate of the treatment. Recently, a subjective test has been used more often to evaluate the success rate of anti-incontinence surgery, because the aim of anti-incontinence surgery is to increase the patient's quality of life. From this viewpoint, a subjective evaluation is essential during the patient follow-up. Moreover, some patients not experiencing subjective symptoms have been diagnosed with stress urinary incontinence by means of the urodynamic

test.¹⁹ Accordingly, it is important to assess the subjective symptoms during follow-up. However, an assessment of the patient's subjective symptoms alone is insufficient for evaluating the correct status of urinary incontinence.²⁰ Therefore, in order to evaluate the patient's status exactly, both the patient's subjective symptoms and the objective test results need to be considered.

Since, the success rate of the Burch colposuspension is known to decrease as the follow-up duration increases, it is believed that a long term follow-up of patients undergoing a Burch colposuspension with a hysterectomy will be needed. Furthermore, in order to determine the most appropriate treatment for patients with urinary incontinence and pelvic mass, a comparison of the success rates according to the hysterectomy routes (vaginal or abdominal) is also required.

This study showed that there no adverse effects during the 1 year follow-up period either in terms of the outcome or complications, in patients who had undergone a Burch colposuspension with an abdominal hysterectomy.

REFERENCES

1. Kohli N, Karram MM. Urodynamic evaluation for female urinary incontinence. *Clin Obstet Gynecol* 1998; 41:672-90.
2. Colombo M, Scalabrino S, Maggioni A. Burch colposuspension versus modified Marshall-Marchetti-Krantz urethropexy for primary genuine stress urinary incontinence: a prospective, randomized clinical trial. *Am J Obstet Gynecol* 1994;171:1573-9.
3. Bergman A, Elia G. Three surgical procedures for genuine stress urinary incontinence: five-year follow-up of a prospective randomized study. *Am J Obstet Gynecol* 1995;173:66-71.
4. Green TH Jr. Urinary stress incontinence; pathophysiology, diagnosis and classification. *Gynecologic and Obstetric Urology*. Edited by HS Buchsbaum, SB Schmidt. Philadelphia: W. B. Saunders; 1978. p.162-88.
5. Hanley HG. Urge incontinence. *Br J Urol* 1965;37:678-80.
6. Snooks SJ, Badenoch DF, Tipataft RC. Perineal nerve damage in genuine stress urinary incontinence. An electrophysiological study. *Br J Urol* 1985;57:422-6.
7. Parsons KF, Turton MB. Urethral supersensitivity and occult urethral neuropathy. *Br J Urol* 1980;52:131-7.
8. Parys BT, Haylen BT, Hutton JL. The effects of simple hysterectomy on vesicourethral function. *Br J Urol* 1989; 64:594-9.
9. Langer R, Neuman M, Ron-El R. The effect of total abdominal hysterectomy on bladder function in asymptomatic women. *Obstet Gynecol* 1989;74:205-7.
10. Farghaly SA, Hindmarsh JR, Worth PH. Posthysterectomy urethral dysfunction: evaluation and management. *Br J Urol* 1986;58:299-302.
11. Bump RC, Mattiasson A, Brubakes LP. The standardization of terminology of female pelvic organ prolapse and pelvic floor dysfunction. *Am J Obstet Gynecol* 1996;175:10-7.
12. Abrahams P, Blaivas JG, Stanton SL. The standardization of terminology of lower urinary tract function recommended by the International Continence Society. *Int Urogynecol J* 1990;1:45-58.
13. Makinen JI, Gronroos M, Kiilholma PJA. The prevalence of urinary incontinence in a randomized population of 5247 adult Finnish women. *Int Urogynecol J* 1988;3:110-3.
14. Sand PK, Bowen LW, Ostergard DR. Hysterectomy and prior incontinence surgery as risk factors for failed retropubic cystourethropexy. *J Reprod Med* 1988;33: 171-4.
15. Meltomaa SS, Haarala MA, Taalikka MO. Outcome of Burch retropubic urethropexy and the effect of concomitant abdominal hysterectomy: a prospective long-term follow-up study. *Int Urogyn J* 2001;12:3-8.
16. Smith PH, Ballantyne B. The neuro-anatomical basis for denervation of the urinary bladder following major pelvic surgery. *Br J Surg* 1968;55:929-33.
17. Wake CR. The immediate effect of abdominal hysterectomy on intravesical pressure and detrusor activity. *Br J Obstet Gynecol* 1980;87:901-2.
18. DeLancey JOL. Structural support of the urethra as it relates to stress urinary incontinence: the hammock hypothesis. *Am J Obstet Gynecol* 1994;170:1713-23.
19. Herbertsson G, Iosif CS. Surgical results and urodynamic studies 10 years after retropubic colpourethrocystopexy. *Acta Obstet Gynecol Scand* 1993;72:298-301.
20. Jensen JK, Nielsen FR, Ostergard DR. The role of patient history in the diagnosis of urinary incontinence. *Obstet Gynecol* 1994;83:904-10.