

Comparison of the Laparoscopic and Laparotomic Retropubic Colposuspension in the Treatment of Genuine Urine Stress Incontinence: A Retrospective Study

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Background. This study compared the differences between laparoscopic and laparotomic retropubic colposuspensions in the treatment of patients with genuine urine stress incontinence.

Methods. Between January 1997 and December 1998, we studied 70 patients by dividing them into two groups: a laparoscopic colposuspension group and a laparotomic colposuspension group. The concomitant operations included hysterectomy, salpingectomy, salpingo-oophorectomy, ovarian cystectomy, utero-vaginal suspension with round ligament shortening, modified McCall-Moschowitz culdoplasty and colpopexy, and posterior colpoperineorrhaphy. Their perioperative courses and follow-ups were then compared for more than a year. The operation efficiencies were evaluated by subjective questionnaires, an estimated pad test and an objective urodynamic examination.

Results. The patients in the laparoscopic group had longer operative times, less blood loss, less morbidity, shorter hospitalizations, and a similar successful rate when compared with patients in the laparotomic group. The subjective success rates between laparoscopic and laparotomic group were 94% and 91% respectively.

Conclusions. Conclusions. With advanced operative laparoscopy technology, the laparoscopic approach to colposuspension had similar efficiencies and less morbidities in genuine stress incontinence when compared to the laparotomic approach. (*Mid Taiwan J Med* 2000;5:228-34)

Key words

Burch colposuspension, genuine stress incontinence, laparoscopy

INTRODUCTION

The Burch colposuspension, first described in 1961, has been considered as the "golden standard" procedure in genuine stress incontinence [1]. The open Burch colposuspension successfully restores continence in 84% to 94% of patients within 1 to 2 years [2]. However, access to the retropubic space involves a large abdominal incision that can

produce significant postoperative morbidity and prolonged hospitalization [5-6]. In an effort to reduce morbidity associated with the abdominal retropubic urethropexy, a minimally invasive technique known as transvaginal needle bladder neck suspension was developed by Pereyra in 1959 [3]. Unfortunately, the needle bladder urethropexy and its many modifications have exhibited lower long-term cure rates and an increased incidence of postoperative voiding dysfunction compared with the traditional retropubic approach [4]. Laparoscopy has evolved into an alternative technique that

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permits placement of suspension sutures under direct vision while avoiding the morbidity associated with the open retropubic colposuspension. However, long-term durability of the approach is controversial [7-11]. The aim of this study was to evaluate the clinical differences between laparoscopic and open Burch colposuspension in genuine stress incontinence. Some authors compared the effects of these two approaches with a subjective evaluation [12]. In this report, we evaluated the clinical change prior to and after operative condition with objective and subjective evaluation.

MATERIAL AND METHODS

Between January 1997 and December 1998, there were pre-menopausal patients with genuine stress incontinence receiving the operative retropubic colposuspension at China Medical College Hospital. All patients accepted the pelvic examination, urodynamic examination, and sonography preoperatively. The degree of uterovaginal prolapse, incontinence, and other associated symptoms (bearing-down sensation, frequency, and urgency of urination etc) were recorded in detail. The other combined urogynecologic conditions included uterine leiomyoma, adenomyosis, cervical carcinoma *in situ*, uterovaginal prolapse (grade I), cystocele (grade I), enterocele (grade I), and ovarian cysts (endometrial cyst, cystadenoma, dermoid cyst, simple cyst etc). The cases of grade II or III uterine prolapse were excluded.

The subjective self-estimation of each patient was recorded via telephone interview, written questionnaire, and outpatient visits. The objective evaluation of the urinary continence was done by a 60-minute estimated pad test (EPT) and urodynamic studies. The pre- and post-operative results of both groups were compared by using the *t*-test and χ^2 tests with SAS software. The established success rate consisted of improvement and the cure rate. Improvement was defined according to one of the following

criteria: 1) more than one-degree improvement of continence compared to the pre-operation condition 2) normal results of the urodynamic study and no need for an underpad even with occasional incontinence. We defined the cure rate as being the cumulative subjective and objective evaluations showing normal results. A *p* value of less than 0.05 was considered as significant.

Operation Methods

We divided the patients into two groups, according to the two operative approaches: the laparoscopic and the laparotomic groups. The same surgeon (WC Lin) performed all operative procedures. Both groups accepted the same retropubic urethropexy (modified Burch method, Hodgkinson's method) procedures.

Group 1: Laparoscopic Approach. All patients were placed in the dorsal lithotomy position. A no. 14 Foley catheter was inserted to decompress the bladder. A pneumoperitoneum was obtained in standard fashion with a Veress needle. A 10-mm trocar was placed in the inferior umbilical crease. Two 5-mm ancillary trocars were placed at the level of the umbilicus in the bilateral middle quadrant, lateral to the rectus muscle. A fourth 5-mm suprapubic trocar was then inserted medial to the lateral umbilical ligament and 20 mm above the pubic symphysis. The dissection was initiated by transverse incision of the peritoneum two-finger border above the symphysis pubis and medial to the inferior epigastric vessels. The transversalis fascia and Retzius space were incised and pushed downward. The Retzius space was then opened to identify the Cooper's ligament. The paravaginal space was developed from mid-urethra to the ischial spine. Other anatomic landmarks were identified, including the internal obturator muscle, arcus tendineus, pubocervical fascia, urethra, bladder neck, obturator foramen and its bundle nerves and vessels. The ischial spine, coccygeal, and piriformis muscles were also identified. Two interrupted paravaginal repairs were

Table 1. Patient characteristics and degree of stress urinary incontinence

Groups	Group 1 (laparoscopy)	Group 2 (open)	p value
No. of patients	35	35	
Age (yr)*	41.2 ± 3.7	42.1 ± 4.1	NS
Parity*	2.7 ± 0.8	3.1 ± 0.8	0.01
Vaginal delivery > 4000 gm	4 (11.4) [†]	3 (8.6)	NS
Degree of stress urinary incontinence			
1	8 (22.9)	6 (17.1)	NS
2	23 (65.7)	26 (74.3)	NS
3	4 (11.4)	3 (8.6)	NS

*Data are expressed as mean ± SD. [†]Data in the parentheses represent percentages. NS = no significant difference (*p* value > 0.05).

Table 2. Comparison of the operation results, combined operation and follow-up

Groups	Group 1 (laparoscopy)	Group 2 (open)	p value
Operative time (min)*	126.0 ± 40.7	93.7 ± 37.0	< 0.05
Blood loss (ml)*	55.3 ± 30.3	631.4 ± 229.6	0.0001
Combined operation			
Hysterectomy	20 (57.1) [†]	23 (65.7)	NS
Ovarian cystectomy	10 (28.6)	8 (22.9)	NS
Oophorectomy	5 (14.3)	4 (11.4)	NS
Round ligament shortening	10 (28.6)	8 (23.0)	NS
Modified McCall-Moschowitz culdoplasty and colpopexy	30 (85.7)	33 (94.3)	NS
Posterior colporrhaphy	21 (60.0)	25 (71.4)	NS
Hospitalization (days)*	3.9 ± 1.3	6.2 ± 2.4	0.0001*
Follow-up (months)*	15.3 ± 3.6	14.1 ± 2.4	NS
Outcome			NS
Cured (no incontinence)	29 (82.9)	28 (80)	
Improved (occasional incontinence)	4 (11.4)	4 (11.4)	
Failure	2 (5.7)	3 (8.6)	

*Data are expressed as mean ± SD. [†]Data in the parentheses represent percentages. NS = no significant difference (*p* value > 0.05).

performed with a no. 1, CT-2 needle and sawe unabsorbable polybutylate-coated polyester material (Ethibond, Ethicon, UK) placed 1-2 cm apart. Starting from the upper part of the iliococcygeal muscle to the lower part parabladder level we sutured the pubocervical fascia upward to the arcus tendineus of the levator ani. The Burch procedure was performed by suturing the pubocervical fascia to the Cooper's ligament with a no. 2, CT-2 needle, and Gore-Tex sutures (W.L. Gore & Associates, Inc, Flagstaff, Arizona). Two r stitches were made over the levels of the mid-urethra and bladder neck, respectively. The reperitonized bladder flap was performed on all patients. The Foley catheter was removed postoperatively 48 hours later, and then the residual urine was checked.

Group 2: Laparotomic Approach. In the traditional group, the approach to the Retzius space and further colposuspension were similar to the laparoscopic group. No drainage was put in the Retzius and paravesicle space. After carefully checking the bleeder, the abdominal wound was closed in standard fashion.

RESULTS

There were 70 cases in this series, 35 cases of group 1 (laparoscopy) and 35 cases of group 2 (open). There were no significant differences in the age, or degree of incontinence between the two groups (Table 1). The detailed personal characteristics of both groups aer presented in table 1. The hospitalization for group 1 was shorter than

group 2. The concomitant operations, operation results, and follow-up in both groups are summarized in Table 2. The combined operations, follow-up period, and subjective cured rates in both groups were not statistically significant. In the laparoscopic group, longer operative time, less blood loss, and shorter hospitalization were observed when compared with the laparotomic group. The period of recording urinary continence ranged from 1 to 2 years postoperatively. The clinical success rates were 94% *vs* 91% between laparoscopic and laparotomic groups, respectively.

Operative complications were rare in both groups. Only two patients with wound infection were noted in the laparotomic group. Two from the laparoscopic and three patients from the laparotomic groups had transient postoperative voiding difficulty. All five patients were discharged after teaching self-catheterization within eight hospitalized days.

DISCUSSION

Genuine stress incontinence is a pathologic condition usually accompanied with poor support to the pelvic organs and excessive mobility of the bladder base due to stress [13,14]. Numerous surgical approaches to stabilize the bladder base have been designed. The three most popular surgical approaches for primary stress urinary incontinence are anterior colporrhaphy [15], vaginal and abdominal retropubic procedures [16-18]. Among these methods, the Burch procedure was suggested to be the golden standard repair for genuine stress incontinence [19]. The long-term follow-up revealed restorative of continence in approximately 80% in the patients [1,20].

With advanced laparoscopic techniques and equipment, the space of Retzius and the surrounding anatomy can be easily dissected and magnified on a TV monitor. Laparoscopic retropubic urethropexy also affords excellent vision within the space of Retzius and allows for easy mobilization of periurethral, paravesical tissue and placement of suspension suture.

The clear view of the surgical site also helps the surgeon to place the sutures correctly on the anterior vaginal wall and Cooper's ligament while avoiding blood vessels. Although the operative time is longer, the laparoscopic approach offers more benefits compared to traditional open retropubic suspensions.

The colposuspension technique used in both laparotomic and laparoscopic groups was anatomically the same, so the continence rates should be similar irrespective of the approach. We believe, the laparoscopic approach should result in a similar cure rate as well. In this series, the subjective cure rates in both groups were similar and compatible with the results of other literature [21]. The failure rates of the laparoscopic and open groups were 6% and 9%, respectively, which was not statistically different. The patients after laparoscopic colposuspension experienced less discomfort, minimal blood loss, a shorter hospital stay, and faster recovery than the laparotomic group experienced.

The genuine stress incontinence often combined with pelvic prolapse. The combined symptoms, including bearing-down sensation, back soreness, and pelvic pain, long-period standing and anal incontinence were present in most patients. We felt that the simple colposuspension would not satisfy the patients' discomfort. Few authors [22] have recommended combined surgical cure. In this series, all patients in both groups accepted the Burch retropubic colposuspension and paravaginal repair for correcting genuine stress incontinence and cystocele. Paravaginal repair and posterior colpoperineorrhaphy were performed on both groups of patients in order to correct the combined cystocele.

Eriksen demonstrated that the colposuspension procedure might aggravate posterior vaginal wall weakness [23]. He also presented that 7% of patients experienced uncomfortable enterocele within 5 years after Burch colposuspension. Stanton also reported that the incidence of post-colposuspension enterocele was as high as 17% [24]. In this series,

the uterovaginal prolapse and as well as to prevent the future enterocele, we adopted the modified McCall-Moschowitz culdoplasty and colpexy in most cases. We believed that the laparoscopic method also enables the further evaluation of the pelvic organs and concomitant operations, as traditional laparotomic approach does.

We agreed with other investigators' reports [2,4,21,25-27], that current postoperative occurrence of detrusor instability and long-term difficulties in voiding were low. In this series, only one case in laparoscopic group had persistent urine retention postoperatively and required urethral dilation. No patient in the open group had long-term voiding difficulty. However, Galloway [27] reported 6 of 50 patients (12%) with Burch colposuspension had one or more urethral dilations. Colombo did the urethral dilation in only 4 of 457 patients operated with laparotomic retropubic Burch colposuspension.

In this series, we adopted the same procedure as the traditional Burch colposuspension in group 1. We emphasized the two-bite bilateral attachment of the anterior vaginal wall to the bilateral Cooper's ligament in the laparoscopic approach. The reason for the poor outcome in other series may be due to inexperienced surgeons or to over simplification of the procedure (only one side colposuspension, or fewer bites when compared with the laparotomic approach). The unilateral suspension may result in poor efficacy of the fixation of the bladder neck. Also, it may distort the urethral adapting. The laparoscopic Burch procedure needs careful dissection, hemostasis, and suturing [28,29]. Under the well-trained surgeon, a similar cure rate could be achieved.

Our data compared contemporary patients undergoing laparotomic and laparoscopic Burch colposuspension procedures at one institution. Laparoscopy provided a better visibility of the operative field, more precise placement of paraurethral sutures and satisfactory hemostasis. The results also indicated that the laparoscopic approach

provides equivalent cure rates with less morbidity when compared with laparotomic retropubic colposuspension. However, the operative time for laparoscopic Burch method was longer than that for the laparotomic approach.

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腹腔鏡及傳統開腹式陰道膀胱頸懸吊術在治療應力性尿失禁患者之比較：一回溯性研究

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背景 本研究之目的，在比較應力性尿失禁之患者，經過腹腔鏡及傳統開腹式陰道膀胱頸懸吊術後，兩者結果之比較。

方法 自1997年一月至1998年十二月，收集70位患者。第一組接受腹腔鏡手術治療，共35人。第二組接受傳統開腹式手術治療，共35人。兩者皆有合併其他開刀方式如子宮切除、卵巢切除等。經1-2年追蹤後，以病患主觀尿失禁症狀、客觀的尿動力檢查和一小時棉墊測試做分析。

結果 在腹腔鏡手術組，有較長的開刀時間，但較少的出血量、併發症及住院日。而手術成功率則與傳統開腹式相同，各為94%及91%。

結論 在治療應力性尿失禁患者，腹腔鏡較傳統開腹式陰道膀胱頸懸吊術，有較少的罹病率，但有相同的成功率。(中台灣醫誌 2000;5:228-34)

關鍵詞

Burch 陰道膀胱頸懸吊術，應力性尿失禁，腹腔鏡

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