Uterine Preservation in the Surgical Management of Uterine Prolapse: A Laparoscopic Approach

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Objective: To manage symptomatic uterine prolapse in young women who wish to preserve uterine function and psychosexual satisfaction, uterine preservation is of prime consideration. In the present study, a laparoscopic high McCall colpophyxy was performed to treat uterine prolapse in young women desiring preservation of uterine function or fertility.

Methods: From January 1996 through January 1998, thirteen women with moderate uterine prolapse with or without other pelvic relaxation were included in the present study. They were treated by laparoscopic high McCall colpophyxy in conjunction with other laparoscopic procedures. Non-absorbable suture materials and extra-corporeal knot-tying techniques were used. Two to three purse-string sutures were placed through the uterosacral cardinal-ligament complex to suspend the posterior surface of the cervix to the presacral area.

Results: All patients tolerated the procedures well and reported no relaxation at follow-up visits for a mean period of 23.5 months.

Conclusions: Our experience indicates the feasibility of this procedure as an alternative treatment to traditional vaginal hysterectomy. The laparoscopic approach is especially well received in the young women with uterine prolapse who wish to preserve uterine function.

Key words: high McCall colpophyxy, uterine preservation, uterine prolapse, laparoscopy

Surgical management of uterovaginal prolapse by hysterectomy and colporrhaphy is appropriate in the elderly. However, treatment in young women with symptomatic genital prolapse is a special problem, especially when the patient desires to preserve uterine function, childbearing potential and satisfactory sexual activity. Sexual dysfunction, including dyspareunia and loss of libido is often attributed to pelvic relaxation. Therapeutic approaches include trans-abdominal construction of a sacroccygeal ligament with the transplanted fascia lata femoris, and transvaginal sacrospinous fixation of the uterosacral ligaments [1,2]. The transvaginal approach is claimed to be less time consuming and produces less morbidity than abdominal surgery [2].

The advent of laparoscopy offers a less invasive approach to this problem with the possibility of reducing the risk of intra-abdominal adhesions. Laparoscopic sacral colpophxy has been used for the repair of the vaginal vault prolapse [3]. However, it requires laborious and extensive dissection of tissues, and may cause undesired presacral hemorrhage. Recently, laparoscopic high McCall colpophyxy developed by Liu has been shown to be a useful alternative for the treatment of vaginal vault prolapse following hysterectomy [4]. It is plausible that laparoscopic high McCall colpophyxy may also be used to treat uterine prolapse in

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young women desiring preservation of uterine function.

**MATERIALS & METHODS**

From January 1996 through January 1998, thirteen women with moderate (grade II) uterine prolapse with or without other pelvic relaxation undergoing laparoscopic procedures at Tainan Municipal Hospital or Ping-Tung Christian Hospital were included in the present study. The age of the patients ranged from 32 to 41 years, with a mean age of 35.1 years. Mean parity was 2.0 births (range one to three). The associated pelvic relaxation included cystocele only in 5 patients, rectocele only in 2 cases, and both cystocele and rectocele in 5 patients. An obstetric history was taken, including information on prolonged labor course, instrument delivery, and cesarean section. Occupational risks of jobs which involved increased abdominal pressure were also elicited. The most common symptoms included interference with coitus, bulging mass while walking or straining, increased pelvic pressure, a bearing down sensation, and low back pain. The patients were examined in the supine and standing positions, both with and without the Valsalva maneuver, to determine the degree of uterine prolapse and associated pelvic relaxation.

During surgery, all patients were placed in the low dorsal lithotomy position. After the establishment of video-laparoscopy, a high McCall colpexy was performed as follows. Routinely, both ureters were dissected from the pelvic brim downward to the level of endocervix. Both uterosacral ligaments were dissected to the presacral region, as far as possible. The first purse-string suture was passed through the left uterosacral cardinal-ligament complex with a no. 2 Gore-Tex™ non-absorbable suture and a CV-2 needle. The suture was then passed through the posterior wall of the vagina with one stitch on the posterior surface of the cervix; the rectovaginal septum was included without going into the vaginal canal. Then the suture was passed through the peritoneum on both gutters of the rectosigmoid colon, the serosal layer of the rectosigmoid colon, and back to the left uterosacral cardinal-ligament complex (Figure 1). An extra-corporeal knot-tying technique with a knot pusher was used. While an assistant placed two fingers inside the vagina and gently applied pressure pushing up-
Table. The Clinical Manifestations and Therapeutic Procedures in 13 Young Women with Moderate Uterine Prolapse

<table>
<thead>
<tr>
<th>Case</th>
<th>Age</th>
<th>Parity</th>
<th>F/U</th>
<th>Cystocele</th>
<th>Rectocele</th>
<th>Other procedures</th>
<th>Vacuum delivery</th>
<th>Heavy work</th>
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<tr>
<td>1</td>
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<td>2</td>
<td>33</td>
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<td>-</td>
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<tr>
<td>2</td>
<td>34</td>
<td>2</td>
<td>31</td>
<td>Central</td>
<td>+</td>
<td>Round</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>3</td>
<td>35</td>
<td>1</td>
<td>30</td>
<td>Central</td>
<td>+</td>
<td>Round</td>
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<tr>
<td>4</td>
<td>34</td>
<td>3</td>
<td>30</td>
<td>Central</td>
<td>-</td>
<td>BS</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>5</td>
<td>35</td>
<td>1</td>
<td>28</td>
<td>-</td>
<td>+</td>
<td>BS, Coag, SO</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>6</td>
<td>37</td>
<td>2</td>
<td>27</td>
<td>Central</td>
<td>-</td>
<td>Burch</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
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<td>35</td>
<td>2</td>
<td>26</td>
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<td>+</td>
</tr>
<tr>
<td>8</td>
<td>32</td>
<td>2</td>
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<td>-</td>
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<tr>
<td>9</td>
<td>41</td>
<td>3</td>
<td>20</td>
<td>Lateral</td>
<td>+</td>
<td>Burch, Round</td>
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<td>+</td>
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<tr>
<td>10</td>
<td>36</td>
<td>3</td>
<td>18</td>
<td>Lateral</td>
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<td>Burch</td>
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<td>-</td>
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<tr>
<td>11</td>
<td>37</td>
<td>2</td>
<td>16</td>
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<td>Coag, Round, SO</td>
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<td>-</td>
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<tr>
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Note: F/U: postoperative follow-up period in months; Central: central type cystocele repaired by anterior colporrhaphy; Lateral: lateral type cystocele repaired by paravaginal repair; BS: bilateral salpingectomy; Burch: Burch colposuspension for genuine stress incontinence; Coag: electrocoagulation for endometriotic foci; Round: round ligament shortening; SO: salpingo-oophorectomy.

ward, the second and the third sutures were placed in the same fashion but through the uterosacral ligaments at a level slightly higher than the first suture. These sutures were intended to suspend the upper vagina and cervix to the presacral area at a level above and parallel to the levator plate which passes through the third or fourth sacral vertebra (Figure 2). When necessary, hemi-Moschowitz culdoplasty on each side of the pelvis was performed while avoiding compromising the patency of the rectum [5]. During the entire procedure, both ureters were directly visualized to avoid inadvertent kinking or trapping along the pelvic sidewall. Shortening of the round ligament was also done to correct the retrodisplaced uterus. When indicated, an anterior colporrhaphy (or paravaginal repair) and/or posterior colpo-perineorrhaphy were performed [6]. In cases with concomitant genuine stress incontinence, a laparoscopic Burch colposuspension with hernia mesh and surgical staples was performed to avoid undue difficulty in placing sutures in a restricted space [7]. Other procedures performed included an oophorectomy for adnexal pathology and electrocauterization of endometriotic foci.

RESULTS

Twelve patients had surgery at Tainan Municipal Hospital (cases 1 to 12, Table), whereas one patient (case 13) was treated at Ping-Tung Christian Hospital. The procedures were tolerated well by all thirteen patients. Postoperatively, the patients had minimal pain and tolerated a regular diet the first postoperative day. Urinary urgency was found in one of three cases that had undergone Burch colposuspension; however, the condition was resolved well with an antispasmodic (oxybutynin 5mg, 1 tablet, bid for 2 weeks).

The clinical manifestations and therapeutic procedures of these thirteen patients are summarized in the Table. Cystocele was corrected by either anterior colporrhaphy for the central type in seven cases (cases 1 to 4, 7, 11, 13), or paravaginal repair for the lateral type in three cases (cases 8 to 10). Posterior colpo-perineorrhaphy was performed in seven cases (cases 2, 3, 5, 6, 9, 10, 13) to correct rectocele. Other adjunctive laparoscopic procedures included shortening of the round ligament for retrodisplaced uterus in four cases (cases 2, 3, 9, 11), Burch colposuspension for concomitant genuine stress incontinence in
three cases (cases 6, 9, 10), and bilateral salpingo-
rectectomy for hydrosalpinx in two cases (cases 4, 5). In addition, three patients (cases 5, 11, 12)
underwent oophorectomy for ovarian pathology,
and two patients (cases 5, 11) had electrocoag-
ulation for the endometriotic foci. The average
length of hospital stay was 2.1 days. The hospital
stay was 1.4 days if cases receiving Burch colpo-
suspension as an adjunct procedure were ex-
cluded. There was no recurrent pelvic relaxation
during the 12 to 33 months follow-up period.

DISCUSSION

The loss of or a defect in the normal pelvic
supporting tissues produces genital prolapse
including uterine prolapse, cystocele, rectocele
and enterocele. The "boat in dry dock" concept of
pelvic floor disorders proposed by Norton ex-
plains the anatomic and physiologic mechanisms
of pelvic relaxation [8]. The uterus (boat) is
supported by the pelvic floor musculature (water)
and held in place by the pelvic ligaments (moor-
ing). Loss of pelvic muscle tone (water) may
place excessive force on the pelvic ligaments
[8,9]. The support of the upper one third of the
vagina comes from the uterosacral cardinal-
ligament complex (called level 1 suspension).
Fibers are extended both vertically and posteri-
orly toward the sacrum. The normal vaginal axis
is almost horizontal and is held by an intact
levator plate [10,11]. Loss of integrity of the
levator plate and the uterosacral cardinal-ligament
complex may cause the vagina to lose its hori-
zontal position (as illustrated in Figure 2 solid
line). The uterus and the upper vagina overlie
the levator hiatus, leading to prolapse [12].

In young women, conditions associated with
weakening of the uterine supporting mechanism,
include early childbearing, large family size,
unskilled supervision of deliveries, closely spaced
births and prolonged hours of squatting while
working [13]. Ligaments and muscles of the
pelvic floor are intimately interdependent. Dam-
age to either muscles or ligaments may be respon-
sible for prolapse [14]. In addition, an intrinsic
abnormality of collagen synthesis that leads to
decreased total collagen content with abnormal
connective tissues in the fasciae may explain the
weakness of the pelvic support tissue in those
patients without a history of pelvic damage [8]. In
the present study, seven patients had a history of a
prolonged second stage of labor that required the
use of vacuum delivery. Seven patients worked in
situations involving increased intra-abdominal
pressure such as heavy lifting for extended peri-
ods.

A complete clinical evaluation including the
degree of pelvic relaxation, the severity of the
symptoms and the needs of the patient are man-
datory to decide the type of surgery [15]. Hyster-
ectomy may not be universally required in women
with uterine prolapse, particularly in young
women who desire to preserve uterine function.
In genital prolapse, the uterus itself is healthy but
there is a disrupted vaginal axis and weakness of
the pelvic floor [12]. Uterine preservation does
not always predispose to further postoperative
prolapse [16,17]. In fact, hysterectomy may
rupt the natural support structures and actually
increase the size of the levator hiatus, through
which subsequent herniations can occur. More-
over, hysterectomy may carry a significant risk
factor leading to the recurrence of genuine uri-
nary stress incontinence. Other significant prob-
lems associated with hysterectomy include the
possibility of sexual dysfunction, vault prolapse,
and psychological misgivings [13].

Although several techniques have been pro-
posed to manage uterine prolapse with uterine
preservation, the laparoscopic procedure provides
unique advantages in identifying and correcting
pelvic floor disorders in a minimally invasive
manner [3,4,18,19]. The laparoscopic approach to
the pelvic floor potentially enables the surgeon
not only to correct uterine prolapse but also to
treat anterior compartment relaxation, including
bladder neck hypermobility and paravaginal
defects, through retropubic colposuspension and
paravaginal repair [19]. When uterine retrodis-
placement is associated with uterine prolapse,
correction of the retrodisplaced uterus is done
concomitantly by shortening the round ligament
to relieve further weight bearing in the erect
position. A laparoscopic high McCall colpopexy
achieves anatomic reconstruction without dis-
rupting the natural structural supports of the
uterus. This technique alone, or combined with
other pelvic reconstructive procedures, offers a
safe, simplified and conservative alternative to
restore the functional pelvic anatomy without the
need for hysterectomy or the extensive dissection
and pllication of tissues required in the laparo-
scopic sacral colpopexy procedure developed by Nezhat et al. [3]. Recently, a hysterocolposacropexy used to treat urogenital prolapse and preserve the uterus has been described by Constantini et al. [20]. This technique uses a synthetic material, Gore-Tex mesh and requires more extensive dissections than our approach.

In conclusion, our experience with laparoscopic high McCall colpopexy in this report demonstrates the feasibility of this procedure for uterine preservation in the surgical management of uterine prolapse in young women who desire to preserve uterine function.

REFERENCES