ABSTRACT

Objective: To describe a new technique of paravaginal repair, utilizing Prolene mesh and a hernia stapler.

Methods: We conducted a retrospective case series review of 12 patients who underwent laparoscopic bladder neck suspension, who were clinically diagnosed with cystocele caused by paravaginal defects. The patients had paravaginal repair performed utilizing mesh and staples. Prolene mesh was stapled to the vaginal margin and suspended from Cooper’s ligament. The technique is described and demonstrated in a line drawing.

Results: All procedures were completed without incident. No additional blood loss or other morbidity has been identified. Results were evaluated by history and examination. Subjective improvement was found in 9 of 11. Adverse effects were not identified. One patient was lost to follow-up.

Conclusion: This procedure is potentially an alternative method for performing the paravaginal repair by a minimally invasive route. We feel that this makes the procedure potentially safer, quicker, and more accessible to laparoscopic surgeons but with equal effectiveness. Larger series with more rigorous analysis are required before the procedure can be evaluated adequately and recommended for general use.

Key Words: Paravaginal, Laparoscopy, Cystocele, Mesh, Staple, Minimally Invasive.

INTRODUCTION

The history of laparoscopic surgery comprises examples of surgeons applying minimally invasive techniques to standard procedures. First, the standard laparotomy technique is used, adapted as little as possible to the constraints of laparoscopy. Then effort and ingenuity are applied to finding ways to make the procedure easier and more accessible, frequently by using innovative instrumentation or equipment.

White1 first described the paravaginal repair as an anatomically correct procedure to repair cystocele caused by detachment of the vesicovaginal fascia from the arcus tendineus. The procedure has been described being done by laparotomy, by a vaginal approach2 and by laparoscopy.3 The standard procedure involves placing sutures from the lateral margins of the vagina to the ipsilateral arcus tendineus. Usually, 3 to 6 sutures are placed on each side. The procedure is frequently awkward or technically difficult because of the angles involved in placing sutures into the depths of the space of Retzius. Laparoscopically, the procedure is difficult but has been mastered by capable laparoscopic surgeons. Five years ago, we began doing bladder neck suspensions, using a laparoscopic mesh and staple method described by Ou et al.4 Our technique and results are published elsewhere.5 We considered that we could use a similar technique for the paravaginal repair. Eleven patients who were scheduled for laparoscopic bladder neck suspension based on physical examination and cystometrogram were found to have first degree cystocele or worse. A pelvic organ prolapse quantitation examination was performed, and point AA (the relationship of the point 3 cm from the hymeneal meatus to the hymeneal ring while straining) was at -2 or below in all patients. Based on their examinations, none of these patients had central defects. Informed consent was obtained, and the patients had paravaginal repairs done at the same time as their bladder neck suspensions.

Technique

See Figure 1. The laparoscope is placed through the umbilicus in a 10-mm Optivue sheath (Ethicon Endo-Surgery, Cincinnati, OH). A second 10-mm Optivue
sheath is placed in the left lateral position, and a 5-mm Step expanding sheath is used in the right lateral position (Autosuture Step, Tyco Healthcare, Norwalk, CT). Dissection is done with disposable laparoscopic scissors and a Harmonic scalpel (Ultracision, Ethicon Endo-Surgery, Cincinnati, OH). Bipolar cautery is used for hemostasis. After the hysterectomy and any cul de sac repairs are completed, the space of Retzius is entered by making a transverse incision about 2 inches above the pubic symphysis. The incision extends from 1 obliterated umbilical artery to the other and is placed cephalad to the dome of the bladder. The space is dissected bluntly to just below the white line bilaterally. The obturator fossa with its neuro-vascular bundle is carefully identified. The bladder neck repair is accomplished using 2x4-cm rectangles of Prolene mesh stapled on either side of the bladder neck and suspended to Cooper’s ligament. A helical hernia tacker is used to fasten the mesh. After the bladder neck is suspended, the paravaginal repair is begun. Two pieces of Prolene hernia mesh, cut in a semitrapezoidal shape with the apex 1-cm across and the base 5-cm, are used. The front edge of each piece of mesh is vertical, and the rear edge angles down to the base. The lateral vagina is supported by the fingers of the operator’s left hand, while the wide edge of the mesh is stapled to the vaginal margin with the helical tacker. The upper edge is tacked to Cooper’s ligament next to the bladder neck repair. The vertical height of the mesh is about 4 cm so that this leaves a suspension gap and avoids over elevating the vagina. After the repair is suc-

### Table 1.

| Patient No. | Follow-up (months) | Age | Weight (lbs) | Subjective Improvement | Preoperative Cystocele | ABA* | Vaginal Angles | Adverse Effect | Comment |
|-------------|--------------------|-----|--------------|------------------------|------------------------|------|---------------|---------------|---------|
| 1           | 5                  | 37  | 244          | Yes                    | 3                      | 3    | No            | No            | Post colphorrhaphy Cul de sac repair |
| 2           | 6                  | 46  | 171          | No                     | 3                      | 4    | Failure on right | No            | Cul de sac repair |
| 3           | 8                  | 44  | 221          | Yes                    | 3                      | 3    | Yes           | No            | Post colphorrhaphy |
| 4           | 9                  | 39  | 188          | Yes                    | 2                      | 1    | Yes           | No            | Post colphorrhaphy |
| 5           | 13                 | 53  | 180          | Yes                    | 2                      | 2    | Yes           | No            | Preop dyspareunia Hysterectomy Cul de sac repair |
| 6           | 14                 | 36  | 170          | Yes                    | 1                      | 1    | Yes           | No            | Preop data N/A |
| 7           | 14                 | 57  | 212          | Yes                    | 2                      | 3    | Yes           | No            | |
| 8           | 15                 | 41  | 139          | Yes                    | 1                      | 1    | Yes           | No            | |
| 9           | 24                 | 57  | 153          | Yes                    | 3                      | 4    | Yes           | No            | |
| 10          | 25                 | 30  | 179          | Yes                    | N/A                    | N/A  | Yes           | No            | Post colphorrhaphy, Cul de sac repair |
| 11          | 12                 | 46  | 157          | Yes                    | 2                      | 3    | Yes           | No            | |

*ABA is defined as the difference between point BA, the point of greatest descensus on the anterior vaginal wall related to the hymeneal ring, preoperatively and postoperatively.*
cessfully completed, cystoscopy is performed with intra-
venous indigo carmine. The procedure requires only a
small amount of extra time, approximately 15 minutes.
No additional blood loss was encountered. The peri-
toneum is reapproximated either with the stapler or with
a continuous suture of Vicryl. The cystoscopies showed
no staples perforating from the repair, and no instance
was noted of ureteral compromise.

RESULTS

We have done 12 of these repairs over the last 3 years
with good short-term results (Table 1). Results were
evaluated with a structured interview and examination.
Subjective success is defined as a positive answer to the
question “Is your bladder well supported?” Objective suc-
cess is defined by the number ∆BA (∆BA is defined as the
difference between point BA, the point of greatest descen-
sus on the anterior vaginal wall related to the hymeneal
ring, preoperatively and postoperatively). Adverse effects
are defined as a positive answer to the question “Do you
have urge incontinence, dyspareunia, bladder, or vaginal
pain?” Results are shown in Table 1. One patient who
had preoperative deep dyspareunia continued to have
pain with intercourse. One patient had failure of the
repair on 1 side. She had the feeling that her bladder was
dropping but did not have stress urinary incontinence.
One patient was lost to follow-up. No additional mor-
bidity was noted in the immediate postoperative period.
No increase in blood loss was encountered, and the
increase in operating time was estimated at 15 minutes.
All patients were discharged within 48 hours. No urinary
retention beyond 48 hours occurred.

CONCLUSION

We feel that this technique may provide a good alterna-
tive to the standard laparoscopic suture paravaginal
repair and is technically easier to perform. Using staples
and mesh for both the bladder neck suspension and the
paravaginal repair makes placement of the support to the
bladder neck and vagina easier to accomplish laparo-
scopically, and we feel that it makes for a more secure
and reliable repair. We hypothesize that the mesh pro-
vides a framework for reparative fibrosis to reinforce the
repair so that it will become sturdier as time passes,
although this is yet to be proven. Use of sutures requires
greater time and dexterity for adequate placement of
support and, we feel, is more likely to be inconsistent,
less reproducible, and less reliable. Mechanical place-
ment of the staples offers more consistency and easier
placement. The risk of bladder perforation and the possi-
bility of hemorrhage should be no greater for the staple
technique than for the standard technique. So far, in our
hands, the operation causes minimal morbidity and
appears to be safe and effective in our small series with
short follow-up. Our short-term results have been prom-
ising, though it is obvious that longer-term follow-up and
a larger series will be required before the procedure can
become part of the mainstream surgical armamentarium.
We hope that in the future a larger series with sufficient
numbers, controls, and randomization will be undertak-

References:

1. White GR. An anatomic operation for the cure of cystocele.
Am J Obstet Dis Women Child. 1912;65:286-290.
2. Weber A. In: Urogynecology and Pelvic Floor Repair. Walters
MD, Karram MM, eds. St Louis, MO: Mosby; 1999:215-218.
3. Liu CY. Laparoscopic Hysterectomy and Pelvic Floor
Reconstruction. Part Two. Cambridge MA: Blackwell Science;
1996:149-296.
4. Ou C, Presthus J, Beadle E. Laparoscopic bladder neck sus-
pension using hernia mesh and surgical staples. J Laparoendosc
Surg. 1993;3:563-566.
5. Washington JL, Somers KS. Laparoscopic mesh and staple
Burch colposuspension. Int Urogyn J Pelvic Rep. In press.

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