

References

Epidemiology

Hendrix SL, Clark AC, Nygaard I, et al. Pelvic organ prolapse in the Women's Health Initiative: gravity and gravidity. *Am J Obstet Gynecol* 2002; 186: 1160-1166

Of the 16,616 women studied, 14.2% had uterine prolapse. Hispanic women had the highest risk. Parity and obesity were strongly associated with increased risk.

Olsen AL, Smith VJ, Bergstrom JO, et al. epidemiology of surgically managed pelvic organ prolapse and urinary incontinence. *Obstet Gynecol* 1997; 89:501-506.

A retrospective study of 149,554 women age 20 or older found an 11.1% lifetime risk of undergoing a single surgery for pelvic organ prolapse or incontinence. Most patients were older, post menopausal, parous, and overweight. Re-operation was common (29.2% of cases), and the time between repeat procedures decreased with successive repairs.

Repair of Prolapse with the Uterosacral Ligaments

Buller JL, Thompson JR, Cundiff GW, et al. Uterosacral ligament: description of anatomic relationships to optimize surgical safety. *Obstet Gynecol* 2001;97:873-879.

A cadaver evaluating the optimum site in the uterosacral ligament for suspension with regard to adjacent anatomy and suspension strength found that the optimal fixation site is the intermediate portion of the uterosacral ligament 1 cm posterior to its most anterior palpable margin.

Yen CF, Wang CJ, Lin SL, et al. Combined laparoscopic uterosacral and round ligament procedures for treatment of symptomatic uterine retroversion and mild uterine descent. *J Am Assoc Gynecol Laparosc* 2002;9:355-362.

A prospective study of 31 women with an average of follow-up of 3.3 years demonstrated the laparoscopic shortening of the uterosacral ligaments combined with uterine

suspension achieved long-lasting results in repositioning the uterus and relieving symptoms.

Barber MD, Visco AG, Weidner AC, et al. Bilateral uterosacral ligament vaginal vault suspension with site-specific endopelvic fascia defect repair for treatment of pelvic organ prolapse. *Am J Obstet Gynecol* 2000;183:1402-1411.

A study of 46 women demonstrated that suspension of the vaginal cuff of the vaginal cuff to the uterosacral ligaments combined with site specific repair of the endopelvic fascia defects provided excellent anatomic and functional correction of pelvic organ prolapse in most women.

McKinney TB, Rogers R, Shraga J. Laparoscopic vaginal vault suspension utilizing uterosacral ligament fixation for uterine and vaginal vault prolapse. *Obstet Gynecol* 1999;93(suppl):S62.

A study of 60 women with stage II or greater uterine or vault prolapse found that laparoscopic repair using the uterosacral ligaments resulted in successful correction with no failures in up to four year follow-up.

Lin LL, Phelps JY, Liu CY. Laparoscopic vaginal vault suspension using uterosacral ligaments: A review of 133 cases. *J Min Inv Gyn* 2005;12:216-220.

A retrospective analysis of 133 women with vaginal vault or uterovaginal prolapse who underwent laparoscopic uterosacral ligament suspension with post-operative follow-up of 2.0-7.3 years showed 87.2% without recurrence.

Ordering Information

- E-Z Pass™ suture passer
- MetraPass™ suture passer
- DuoGrasp™ grasper
- DuoTie™ knot pusher
- Pilot® guides - 5mm, 10/12 mm
- Investa® suture

To order, contact your CooperSurgical representative.



Elevest[®] Procedure

First choice in uterine prolapse repair

The ELEVEST procedure, an elegant solution for uterine prolapse repair, shortens and strengthens the uterosacral and round ligaments to restore the uterus to its normal anatomic position.

Physicians now have the option to treat uterine prolapse in the most modern way - with laparoscopic techniques using the patient's own support structures.

This surgical guide describes how to perform the ELEVEST procedure using the specially designed instruments in the ELEVEST Procedure Kit:

■ **E-Z Pass[™] suture passer**

Curved needle designed for easy entry into the uterosacral ligaments

■ **MetraPass[™] suture passer**

Curved needle designed to traverse the round ligaments

■ **DuoGrasp[™] grasper**

Dual surfaces designed to hold the uterosacral ligaments securely and to manipulate the round ligaments atraumatically

■ **DuoTie[™] knot pusher**

Open ended design for fast and secure extracorporeal knot tying



■ **Pilot[®] guides**

Assure quick and consistent full-thickness closure of all port sites

■ **INVESTA[®] suture**

Permanent suture designed to pass through tissue easily and maintain strength under tension

Elevest provides patients with an alternative to hysterectomy, expands the surgeon's treatment options and enhances the physician's practice.

Uterosacral Ligaments

Properly support the uterus by shortening and strengthening the uterosacral ligaments as described below.

1. Place trocars according to procedure demands and physician preference.
2. Insert a uterine manipulator and lift the uterus into an anteverted position. Under laparoscopic visualization, identify the uterosacral ligaments and the ureters. If necessary, release the ureters bilaterally by incising the peritoneum lateral to the uterosacral ligaments to prevent kinking.
3. Load the E-Z Pass™ suture passer with a 36 inch length of braided permanent Size 0 suture and insert through the ipsilateral trocar port. an e-PTFE suture may also be used.

Note: Ensure that the suture rests within the recessed portion of the suture passer (Figure A).

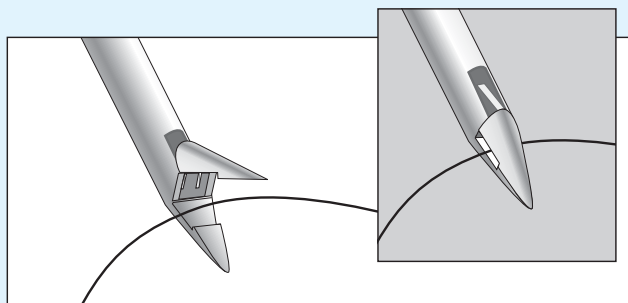


Figure A

4. Grasp the uterosacral ligament from the contralateral side with the DuoGrasp™ grasper and use traction to hold it taut. Place the first suture in the posterior 1/3 of the uterosacral ligament as close to the ischial spine as possible for maximum uterine support (Figure B).

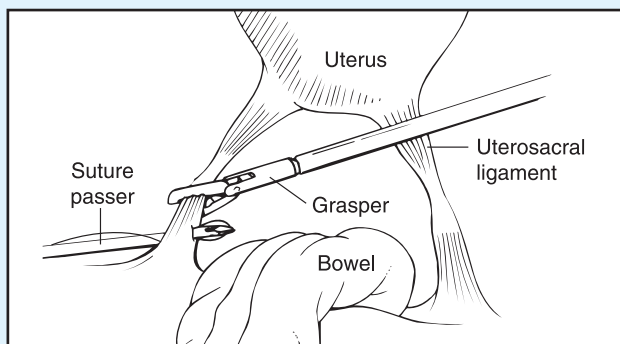


Figure B

5. For increase control, use the DuoGrasp grasper to apply counter traction by pressing the uterosacral ligament over the E-Z Pass suture passer. Using pressure, angle the suture passer to pass through the uterosacral ligament. Release the suture, and remove the suture passer (Figure C).

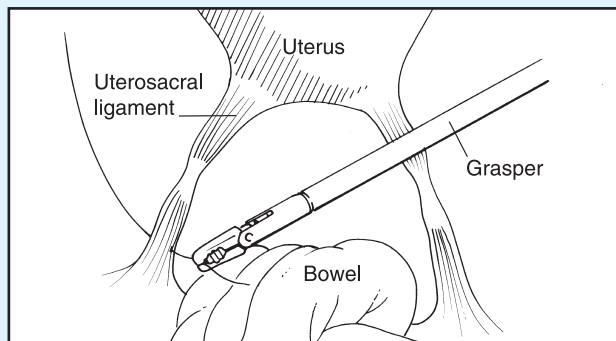


Figure C

6. Grasp the suture again with the E-Z Pass suture passer. Place a second suture through the midpoint of the uterosacral ligament using the technique described in Step 4 (Figure D).

Note: For best results, use the DuoGrasp grasper to hold the uterosacral ligament away from the bowel and other pelvic structures.

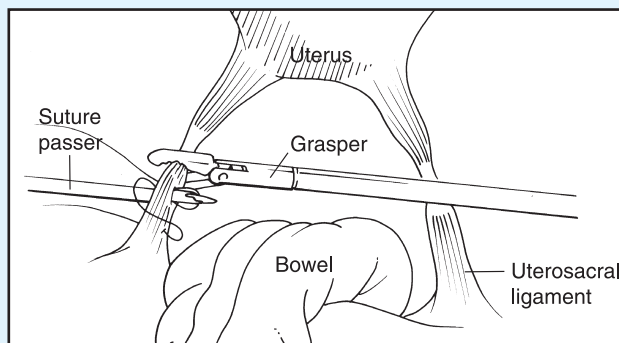


Figure D

- With the suture in the jaw of the suture passer, use the same technique to place a total of 3 or 4 sutures in the uterosacral ligament. The last suture should be placed ≤ 1 cm from the cervix (Figure E).

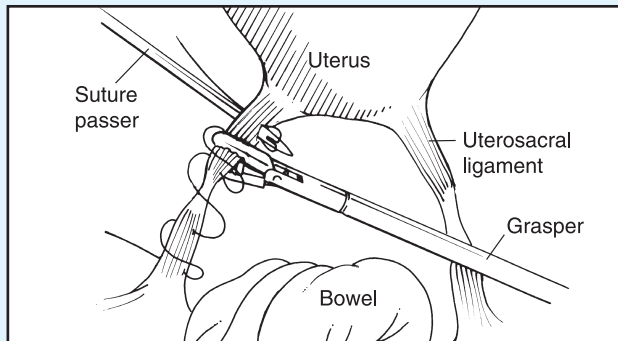


Figure E

- After the uterosacral ligament has been invested with the suture, grasp the ends of the suture and pull it through the trocar. Tie an extracorporeal knot, and use the DuoTie™ knot pusher to push it down to the level of the ligament, thereby shortening the ligament. Tie additional knots to secure suture (Figure F).

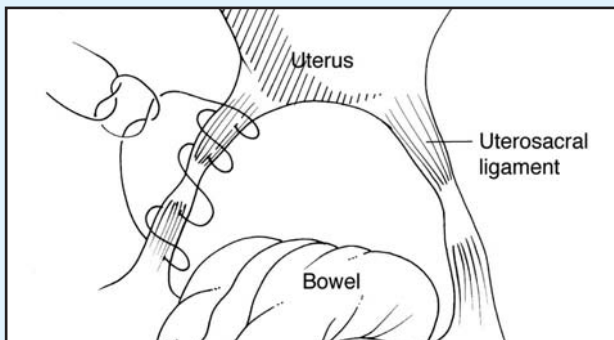


Figure F

- Repeat steps 3-8 on the other side (Figure G).

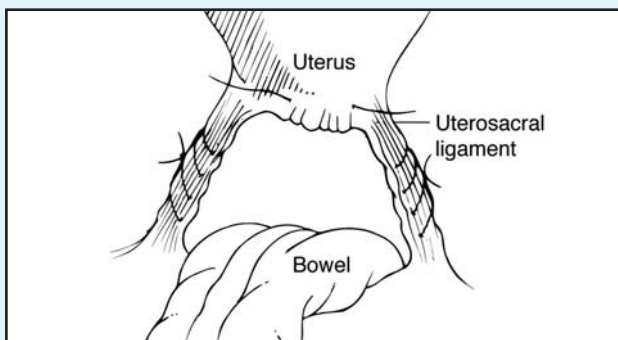


Figure G

Other Suturing Options

Option 1: Using the unloaded suture passer through the uterosacral ligament (Figure H).

- Grasp the suture, and pull the suture passer back through the ligament (Figure I).
- Pass the unloaded suture passer through the uterosacral ligament (Figure H).
- Grasp the suture, and pull the suture passer back through the ligament (Figure I).

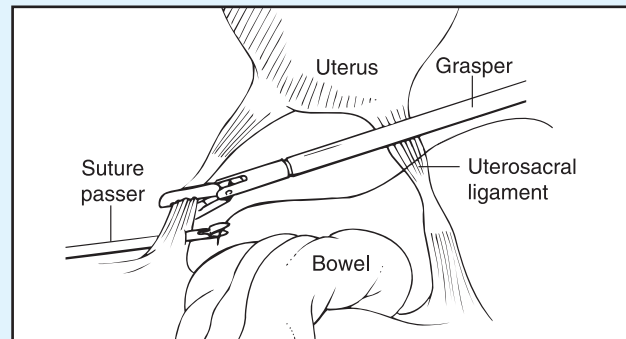


Figure H

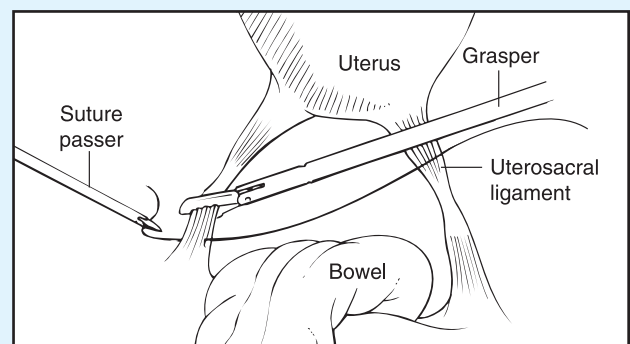


Figure I

Option 2: Using running sutures

Running sutures may also be used when investigating the uterosacral ligaments (Figure J).

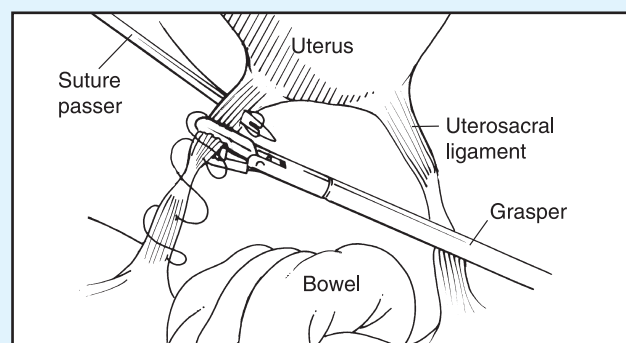


Figure J

Uterosacral ligaments

TIP: Managing a wide cul-de-sac

In cases of a wide cul-de-sac, provide additional support by plicating the uterosacral ligaments together after they have been invested with suture (Figure K).

Pass the loaded E-Z Pass™ suture passer through each of the invested uterosacral ligaments. Tie a series of extracorporeal knots and tighten them down to the plication.

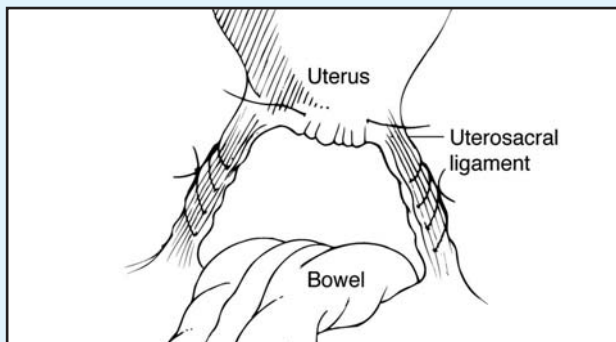


Figure K

Tip: Invest the uterosacral ligaments first

It is easier to achieve correct uterine position after the uterine manipulator is removed. Therefore, it is preferable to invest the uterosacral ligaments first followed by the round ligaments.

However, the Elevest® procedure has also been performed successfully by investing the round ligaments first.

Properly position the uterus by shortening and strengthening the round ligaments as described below.

Locate the Skin Nicks

1. Under laparoscopic visualization, externally palpate the abdominal wall to identify the superior point where the round ligament attaches to the lateral abdominal wall. This location will be used to position the skin nick lateral and superior to the entry point of the round ligament to the inguinal canal.
2. Imagine a straight line from the skin nick to the uterus that passes through the round ligament (Figure L). As a general rule, measure two finger breadths up from the pubic symphysis and two finger breadths over.

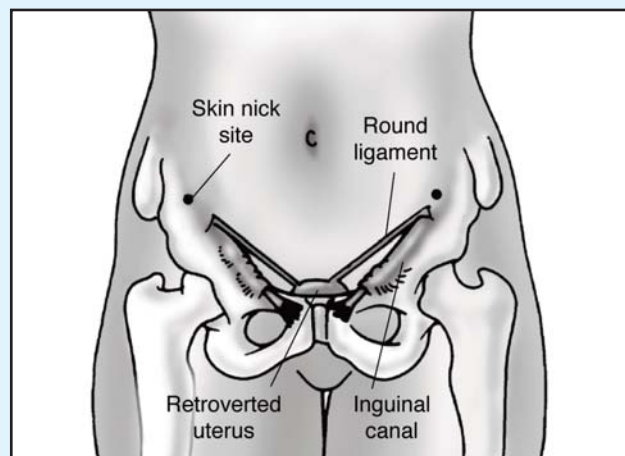


Figure L

3. To locate the suture passer path and guide placement of the skin nicks, puncture the skin with a 20-22 gauge spinal needle filled with 10 cc of 1% lidocaine or 0.5% bupivacaine and insert it along the proposed path of the suture passer. Inject the local anesthetic injection assists with post-operative pain management. It also enhances the volume of the round ligament for easier identification and navigation.
4. Use a scalpel tip to make a 2-3 mm skin nick. Repeat the process on the other side.

Invest the Round Ligaments

1. Use the MetraPass™ suture passer to grasp the INVESTA® suture. Leave an approximately 6 inch tail. INVESTA suture is size 0 monofilament, polybutester suture. It is lubricious, designed to pass through tissue easily, and maintains strength under tension.

Note: Insure that the suture rests within the recessed portion of the suture passer (Figure M).

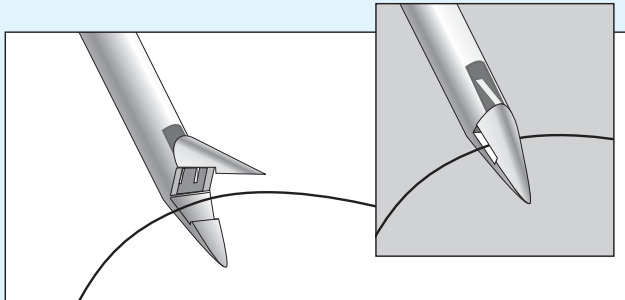


Figure M

2. Insert the suture passer tip in line with the round ligament. Pass through the fascia and muscle (Figure N). the suture passer tip should be positioned preperitoneally at the entrance to the round ligament.

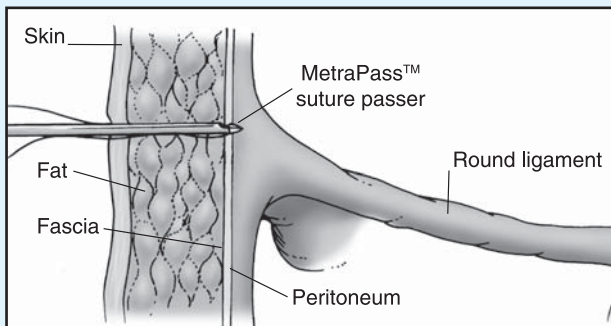


Figure N

3. Position the DuoGrasp™ grasper through the contralateral trocar port. Hold the round ligament as the suture passer traverses within the ligament, exerting counter pressure as necessary to facilitate passage (Figure O). The DuoGrasp grasper features an indentation designed to prevent trauma to the round ligament. Use the uterine manipulator to move the uterus to the contralateral side to stretch the round ligament to facilitate suture passage. Some resistance may be encountered.

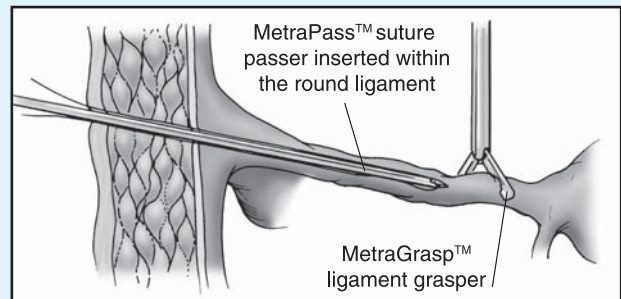


Figure O

4. Traverse the length of the round ligament with the suture passer and exit about 1 cm proximal to the attachment point with the uterus. Release the INVESTA suture, leaving approximately a 6 inch tail (Figure P).

To facilitate exit of suture passer from the round ligament and avoid puncture of the uterus, use the DuoGrasp grasper to exert counter pressure on the ligament.

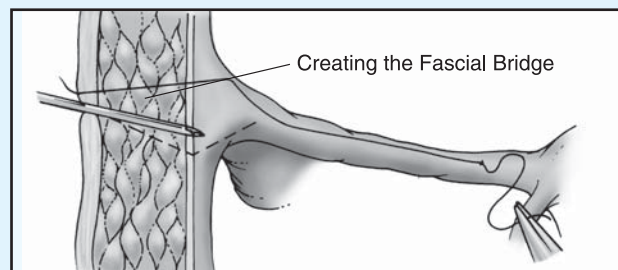


Figure P

Round Ligaments

Tip: Traversing the round ligaments

It is not necessary to remain within the round ligament as it is traversed. If the MetraPass™ suture passer pushes through the round ligament, withdraw the suture passer until it is back within the round ligament and continue the traverse. If the round ligament becomes friable as it is traversed, weave in and out with the MetraPass suture passer to obtain bites of tissue along the round ligament to create a secure suspension.

5. Grasp the INVESTA® suture with the DuoGrasp™ grasper. Hold the suture in place and completely withdraw the MetraPass suture passer.
6. For the second pass, insert the MetraPass suture passer through the same skin nick, so that the tip is positioned preperitoneally at the entrance to the round ligament (Figure P). Leave a 0.5 - 1.0 cm space between the first insertion and second insertion at the fascial level to create a fascial bridge to support the tied suture.

Note: When creating the fascial bridge, the second entry point should be made across the fibers of the fascia from cephalad to caudad. Entering along the fibers may cause the suture to pull out.

7. Traverse the round ligament with the MetraPass suture passer, exiting the ligament about 1 cm proximal to the initial exit point (Figure Q). Grasp the free end of the suture with the MetraPass suture passer. Retrieve the suture through the round ligament and abdominal wall.

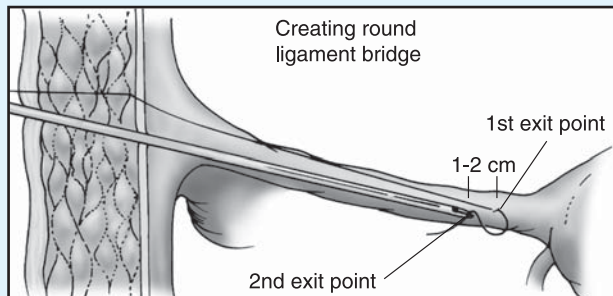


Figure Q

8. Place a clamp on the suture ends to temporarily hold the suture in place while the other round ligament is invested.
9. Repeat steps 1-8 on the opposite side.

Reposition the Uterus

1. Once both sides have been invested with suture, remove the uterine manipulator so a correct anatomic position can be approximated. Pull on the ends of the sutures until the round ligaments are shortened appropriately, gently lifting the uterus into a slightly anteverted position on the midline mimicking the patient's normal anatomy. Tie the suture with 3-4 knots (Figure R).

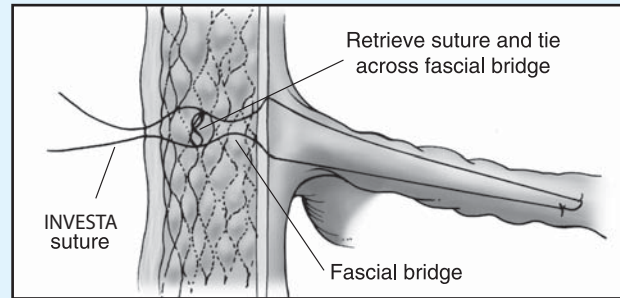


Figure R

2. Use the metraTie™ knot pusher to position each knot below the skin and above the fascia (Figure S). Do not over-tighten the sutures as it may cause post-operative pelvic pain. The MetraTie knot pusher is designed with a slot which will allow approximately 0.25 inches of slack when tying sutures.

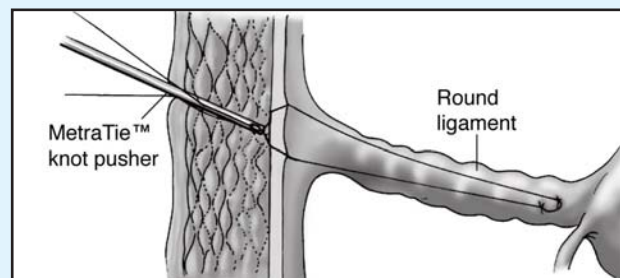


Figure S

3. To minimize post-operative irritation at the skin nicks, grasp the suture tails with the MetraPass suture Passer and embed them in the fascia.
4. Close the skin nicks according to physician preference.

Tip: Managing post-operative pain

To help prevent post-operative pain, a local anesthetic may be injected percutaneously through the course of the round ligaments.

In case of post-operative pain, the patient may require injection of a local anesthetic such as 0.5% bupivacaine.

Pain may take 1-3 days to resolve as any swelling decreases. Referred or radiating pain in the labia or upper thigh may indicate nerve entrapment. Cut the suture on the painful side to relieve tension on the nerve. Unilateral suture release may resolve the pain and still maintain uterine position.

Tip: Minimize the possibility of nerve entrapment

Nerve entrapment occurs rarely. To help minimize this possibility, locate the skin nick lateral and superior to the origination of the round ligament at its most superior attachment to the abdominal wall (the exit point of the round ligament from the inguinal canal). Locating the nicks at this level will allow for suspension of the uterus without entrapment of the ilioinguinal, iliohypogastric and genitofemoral nerves (figure T).

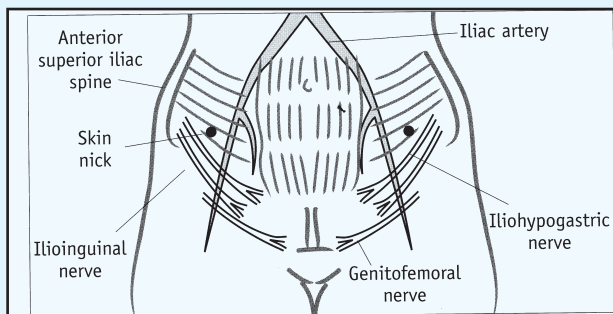


Figure T

Perform full-thickness closure of all port sites (Figure U).

1. Insert the Pilot® guide with the holes aligned perpendicular to the abdominal wall defect. Use the suture passer to push suture through the pilot guide, fascia, muscle, and peritoneum into the abdomen. Drop the suture and remove the suture passer.
2. Push the suture passer through the opposite side of the Pilot guide and pick up the suture.
3. Pull the suture up through the peritoneum, muscle, fascia, and guide.
4. Remove the Pilot guide and tie.

