Robotic/Laparoscopic Prolapse Repair

Role of Hysteropexy: A Urogynecology Perspective

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KEYWORDS

• Sacrocolpopexy • Hysteropexy • Pelvic reconstruction • Pelvic organ prolapse
• Female pelvic medicine and reconstructive surgery • Pelvic floor disorders • Laparoscopy
• Minimally invasive gynecology

KEY POINTS

- Uterine preserving surgery for pelvic organ prolapse may be appropriate for select, appropriately counseled women.
- Short and long-term patient related and anatomic outcomes of hysteropexy (with and without mesh) are needed, including possible complications related to uterine and cervical preservation.
- Surgeons should have a thorough understanding of uterine and cervical disease and fertility prior to counseling women regarding uterine preserving prolapse surgery.

INTRODUCTION

Although the uterus is now known to be a passive bystander rather than the cause of pelvic organ prolapse (POP), POP continues to be the leading cause of hysterectomy performed for benign causes in United States women older than 50 years.[1,2] In the late nineteenth and early twentieth century, before the advent of sterile surgical techniques and preoperative antibiotics, gynecologic surgeons attempted to treat prolapse without hysterectomy to avoid the danger of entering the peritoneal cavity. These early efforts at hysteropexy included uterine ventrofixation, uterine interposition, vaginal colpocleisis, and the Manchester-Fothergill operation, among others; however, all of these procedures lack durability.[3,4] As intraperitoneal surgery became increasingly safe in the latter part of the twentieth century, hysterectomy became a routine part of POP repair, so much so that most currently available surgical outcome data concern women who underwent hysterectomy with pelvic floor repair or had post-hysterectomy prolapse repair.

As women lead longer and more active lives, pelvic reconstructive surgeons increasingly shifted attention to the long-term outcomes and durability of POP repairs. Sacrocolpopexy has emerged as the gold standard for POP repair, with a recent Cochrane review on surgical treatment of pelvic organ prolapse concluding that sacrocolpopexy was associated with better anatomic outcomes, lower rates of recurrent prolapse, longer time to prolapse recurrence, and less postoperative dyspareunia.[5] However, open abdominal sacrocolpopexy was also associated with longer recovery time and hospital stay.[5] Both of these disadvantages may

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Urol Clin N Am 39 (2012) 343–348
http://dx.doi.org/10.1016/j.ucl.2012.06.008

be mitigated by laparoscopic/robotic approaches, making sacrocolpopexy a common choice for primary prolapse repair. As physicians and patients turn toward minimally invasive operations, they have raised the question of why the uterus, a normal organ without intrinsic pathology, must be removed at the time of POP repair. Several investigators published articles on the feasibility of laparoscopic/robotic sacrohysteropexy. The long-term outcomes and implications of hysteropexy are not well studied, and the practice of uterine preservation at the time of pelvic floor repair is currently deemed controversial. The aim of this article is to highlight the techniques, outcomes, advantages, and potential problems surrounding minimally invasive hysteropexy.

HISTORICAL PERSPECTIVE

In the late 1800s, Drs Donald and Fothergill described the Manchester operation.[6] The Manchester operation consists of a circumferential vaginal incision, exposing then amputating the distal cervix and suturing the upper cervix or lower uterine segment to the transected cardinal ligaments for support. Shortly thereafter, Dr Thomas Watkins published his description of the Watkins interposition procedure for uterovaginal prolapse.[7] After the bladder was dissected from the uterus through an anterior colpotomy incision, the uterus was severely anteverted until the uterine fundus was pulled through the colpotomy and sutured to the anterior vaginal wall; this method was also applied to the surgical treatment of vesicovaginal fistulas. The only uterine-sparing vaginal operation still currently in use is the sacrospinous hysteropexy, which can be performed with or without mesh augmentation.[8–10]

In 1930, Arthur Giles[11] published on the outcomes following abdominal hysteropexy, which he described as the fixation of the anterior lower uterine segment to the fascia and muscle of the anterior abdominal wall using silk sutures. His case series contained an impressive 1424 women, including 135 who went on to achieve pregnancy and 111 who delivered following the hysteropexy. Uterine position was evaluated following delivery and was noted to be "normal" or "satisfactory" in 97% of cases, prompting Giles to conclude that "pregnancy has no appreciable effect in producing a return of displacement after hysteropexy has been performed." Fixation of the uterine fundus or the round ligaments to the anterior abdominal wall have since fallen out of favor, because of uterine elongation and lack of effectiveness in the treatment of prolapse over time.[3] In 1993, Joshi[12] described a retrospective cohort of 20 women with uterine suspension to the pectineal ligament with mersilene mesh. Five of these women went on to have a full-term vaginal delivery; long-term prolapse outcomes following the pregnancy and delivery are unknown.

MINIMALLY INVASIVE TECHNIQUES

Robotic/laparoscopic hysteropexy can be performed using sutured native tissue as well as mesh. Maher and colleagues[13] described laparoscopic plication of the uterosacral ligaments to obliterate the posterior cul-de-sac and elevate the cervix posteriorly in 43 women. With 12 $\pm$ 7 months follow-up, 81% were subjectively cured and 79% objectively cured of prolapse. Outcomes are limited by short-term follow-up and lack of validated outcome measures.

Because of its durability, robotic or laparoscopic sacrocolpopexy is the most commonly performed robotic pelvic reconstructive procedure.[14] Several investigators have published on the feasibility of laparoscopic/robotic sacrohysteropexy with varying techniques.[15–17] Most commonly, a rectangular piece of mesh is attached to the posterior aspect of the lower uterine segment and the cervix, extending to just below the level of the uterosacral ligaments, then pexed to the anterior longitudinal ligament at the sacral promontory. The anterior mesh is often Y-shaped, with the single arm attached to the anterior cervix and lower uterine segment, then split into 2 arms, each of which is passed through a window created within the broad ligament, then secured to the anterior longitudinal ligament. Based on data derived from open sacrocolpopexy, anatomic outcomes are better if a permanent mesh is attached to the anterior and posterior vaginal walls (not just the apex), then to the sacrum with permanent sutures.[18,19] Open techniques that do not place the mesh anteriorly are associated with up to 30% anterior vaginal wall recurrence rates.[18] Similarly, sacral sutures are sometimes replaced by tacking devices during robotic and laparoscopic procedures; however, available comparative studies use sutures on the sacrum, so the outcomes after using sacral tacks are unknown.[18,20]

OUTCOMES

There is no level I evidence regarding the impact of uterine preservation on the effectiveness or longevity of prolapse repair, and all available information is based on individual-center case series. Maher and colleagues[13] published their 1-year outcomes of laparoscopic uterosacral hysteropexy in 43 women, reporting an 80% objective and subjective cure rate. Two women in this series