One-Year Anatomical and Functional Outcomes of 302 Elevate Posterior and Apical Mesh Repairs

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ABSTRACT

Objective: POP occurs as a consequence of fibromuscular and endofascial weakness. Women with prolapse often have global support defects causing difficulty in identification and repair. Fascial plication and levatorplasty in rectocele repair can cause over-narrowing of vagina and introitus leading to dyspareunia. Mesh reinforcement is used to correct multiple defects while avoiding vaginal narrowing. Although literatures have reported encouraging results of vaginal mesh repair, the use of mesh in posterior compartment is still controversial. Elevate system® has been developed as a minimally invasive method for mesh augmentation. Our objective is to evaluate outcomes of Elevate Posterior and Apical mesh in the posterior and apical prolapse repair.

Methods: We conducted a prospective study of 302 women undergoing Elevate Posterior mesh reconstruction between 2009 and 2015. Demographic and peri-operative information were recorded. Pre- and post-operative evaluation included symptom, quality of life and POP-Q assessment. Differences in quality-of-life and POP-Q scores were demonstrated using paired t test. Objective cure rates, symptom resolution, quality-of-life measures and peri-operative morbidities were evaluated.

Results: Three-hundred women had posterior vaginal prolapse while 131 had apical descent. Mean operative time was 87±21 minutes. Bleeding complication occurred in 9 while mesh extrusion occurred in 3 women. Significant symptom and quality-of-life improvement were demonstrated at one year. Objective cure rates of Elevate Posterior mesh in the treatment of posterior vaginal and apical prolapse were 93.7% and 92.4% respectively.

Conclusion: Elevate Posterior and Apical mesh reconstruction has delivered impressive clinical outcomes for the treatment of posterior vaginal and apical prolapse.

Keywords: Complications; Elevate Posterior and Apical mesh; objective cure; pelvic organ prolapse; recurrence rates; success rate; surgical outcomes (Siriraj Med J 2018;70: 131-138)

INTRODUCTION

Pelvic organ prolapse (POP), defined as the descent of one or more of the anterior vaginal wall, the posterior vaginal wall, the uterus (cervix) or the vaginal vault or cuff after hysterectomy, often occurs as a consequence of multifactorial etiology which contributes to the weakness of the fibromuscular pelvic supports, endopelvic fascial defects and pelvic floor muscle denervation.[1] As a result, women with prolapse often have global pelvic support defects which may make clear identification of each individual defect and comprehensive defect-specific repair difficult to achieve.

In the posterior vaginal compartment, damage to the rectovaginal septum, which extends from the posterior aspect of the cervix and the cardinal-uterosacral ligaments to its attachment on the perineal body, can result in the formation of both rectocele and enterocele. Conventional surgical techniques aiming to support the vaginal vault

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Received 5 January 2018 Revised 12 March 2018 Accepted 13 March 2018
doi:10.14456/smj.2018.22

or uterus, plicate the rectovaginal fascia, and re-attach the fascia to the vaginal apex have reported variable success rates.[2] Although defect-specific rectocele repair has demonstrated favorable anatomical results with improvement in dyspareunia[3], it is not always easy to identify and repair all defects in the rectovaginal fascia. Furthermore, traditional rectocele repair which includes midline rectovaginal fascial plication and levatorplasty, has been shown to cause over-narrowing of vaginal lumen and introitus leading to dyspareunia, rectal and sexual dysfunction.[4]

Although there are diametrically opposing views and inconclusive data to support the use of synthetic graft material in the posterior compartment repairs[5], a number of prospective series have reported encouraging outcomes of the mesh kit procedures in the treatment of posterior vaginal and apical prolapse.[6,7] The premise of mesh reinforcement of the rectovaginal septum is to overcome global pelvic floor defects without excision of vaginal wall, thus avoiding vaginal narrowing and reducing the risk of recurrence. One of the currently available mesh kit, Elevate Posterior and Apical System (American Medical Systems, Minnetonka, MN, USA), has been developed as a transvaginal, minimally invasive method for correction of posterior compartment defects (rectocoele/ enterocoele) and providing vault support. This is done through a single incision using a soft type I macroporous polypropylene mesh.

The objective of this study is to evaluate the clinical outcomes of the Elevate Posterior and Apical mesh system in the treatment of posterior vaginal and/or apical prolapse.

MATERIALS AND METHODS

After obtaining ethical approval from the Institutional Review Board of the University of Sydney, we conducted a single-center, prospective study of women undergoing Elevate Posterior and Apical mesh reconstruction at our institute, the Centre for Advanced Reproductive Endosurgery, between December 2009 and December 2015. Three hundred and two women who presented with symptomatic posterior vaginal and/or apical prolapse of at least stage II were enrolled. At initial visit, women were asked to complete the Prolapse Quality of Life (P-QOL) questionnaire[8] to assess the severity of urogenital symptoms and how much their symptoms were affecting their quality of life. A four-point scoring system ranging from 0 ("none/not at all"), through 1 ("slightly/a little") and 2 ("moderately") to 3 ("a lot") was used to rate each quality of life domain including prolapse impact, role, physical and social limitations, personal relationships, emotional problems, sleep/energy disturbance and measurement of symptom severity. A higher total score indicated a greater impairment of quality of life, whereas a lower total score determined a better quality of life.

Following symptom and quality of life assessment, the stage and location of the prolapse were then defined according to the Pelvic Organ Prolapse Quantification (POP-Q) system.[9] Preoperative urodynamic studies were carried out when indicated. All women were provided with information regarding details of the surgical procedures, general surgical risks, risks associated with general anesthesia and transvaginal mesh complications, including the 2008 and 2011 FDA Safety Communications[10], before giving informed consent. Placement of the Elevate Posterior and Apical mesh and other concomitant procedures were performed by or under the supervision of the senior surgeon. Prophylactic intravenous antibiotic was administered at the induction of anesthesia. Operative time, intra-operative blood loss, early- and late-onset peri-operative complications as well as postoperative adverse events were recorded. Postoperative follow-up was scheduled at 6 weeks, 1 year and 5 years, or any adhoc time should there be any unexpected concerns. Each follow-up visit evaluation included reassessment of symptom, quality of life, POP-Q measurements and mesh-related complications.

The Elevate Posterior and Apical mesh system is composed of a central graft made of a soft Type I macroporous polypropylene mesh and two apical arms, each containing a small self-fixating tip which is anchored into the sacrospinous ligaments. Placement of the Elevate Posterior and Apical mesh was achieved using the standardized techniques outlined by the manufacturer. Pre-diluted local anesthetic solution, 0.5% Marcaine with Adrenaline 1:200,000, was infiltrated into the posterior vaginal wall. After making a vertical midline full thickness vaginal incision, lateral dissection was performed to free the rectum towards the ischial spines to reach the sacrospinous ligaments. Tissue overlying the sacrospinous ligaments was swept medially. Using the applicator device, each apical mesh arm was fixed to the ipsilateral sacrospinous ligament about 1.5-2.5 cm medial to the ischial spine. The mesh arms were then threaded through the central mesh lateral eyelets. Delayed absorbable suture was used to secure the mesh without tension to the vaginal apex or posterior cervix proximally, and to the lateral vaginal fornices and anorectal junction distally. After proper positioning of the mesh without tension, the self-locking button was slid down each mesh arm until desired tautness was obtained. Both mesh arms were then trimmed at 1-2 cm distal to the locking buttons. The excess portion of the

mesh was removed to suit the vaginal length. Per rectal examination was done to confirm rectal wall integrity and the absence of mesh through rectal wall. Closure of the vaginal incision was completed using delayed absorbable suture without trimming of redundant vaginal skin. Additional reconstructive and anti-incontinence procedures were carried out as indicated, either prior or after mesh placement. An indwelling catheter and vaginal pack were left in place for up to 24 hours.

Statistical analysis

All statistical data were analyzed using the Statistical Packages for the Social Sciences Version 18 for Windows (PASW statistic18). Continuous variables were expressed as means and standard deviations whereas categorical inputs were presented as numbers and percentages. Differences in P-QOL scores and POP-Q measurements were demonstrated using paired Student's t test. The P-value of less than 0.05 indicated statistical significance. The objective cure, which was defined according to the NICHD Pelvic Floor Disorders Network recommendations[11] as points Ap, Bp and C less than or equal to 0 cm, was considered as our primary outcome. Secondary outcomes were composed of (i) subjective resolution of prolapse symptoms, (ii) changes in bladder, bowel and sexual functions, as well as changes in P-QOL scores, and (iii) peri- and post-operative morbidities. Treatment success was defined as: 1) the posterior vaginal and/or apical descent at or above hymenal level 2) absence of bulge symptoms and 3) absence of re-treatment.

RESULTS

A total of 302 women had Elevate Posterior and Apical mesh implantation between December 2009 and December 2015. Information regarding baseline characteristics was displayed in Table 1. Most women (82.5%) had reached menopause. The mean age was 60.7 ± 11.3 years, the mean body mass index (BMI) was 26.6 ± 6.0 kg/m^2 and the average parity was 2.7 + 1.1. One-third (32.1%) was post-hysterectomy patients. Previous reconstructive procedures were categorized as native tissue repair (19.5%), mesh repair (2.6%) and anti-incontinence surgery (9.3%). More than half of women (54.6%) had previously tried pelvic floor muscle exercise without success. Vaginal estrogen was prescribed for preoperative use in 47% of postmenopausal women whereas 62% were given postoperatively. Of 169 women undergoing preoperative urodynamic studies, almost half (45%) were diagnosed with urodynamic stress incontinence.

Other clinical manifestations included overactive bladder symptoms, stress incontinence, voiding difficulty,

TABLE 1. Baseline characteristics (N = 302).

Variables	Mean ± SD or N (%)
Age (years)	60.7 ± 11.3
BMI (kg/m^2)	26.6 ± 6.0
Parity	2.7 ± 1.1
Menopause	249 (82.5)
Previous hysterectomy	97 (32.1)
Abdominal	52 (17.2)
Vaginal	31 (10.3)
Laparoscopic	14 (4.6)
Past native tissue repair	59 (19.5)
Anterior repair	44 (14.6)
Posterior repair	41 (13.6)
Vaginal vault suspension	5 (1.7)
Manchester operation	2 (0.7)
Laparoscopic pelvic floor repair	7 (2.3)
Past mesh repair	8 (2.6)
Anterior vaginal mesh	6 (2.0)
Posterior vaginal mesh	2 (0.7)
Sacrocolpo/hysteropexy	4 (1.3)
Past anti-incontinence surgery	28 (9.3)
Mid-urethral sling	5 (1.7)
Colposuspension	18 (6.0)
Others	5 (1.7)
Pessary use	30 (9.9)
Vaginal estrogen	189 (62.6)
Pre-operative use	35 (11.6)
Post-operative use	71 (23.5)
Pre- and post-operative use	83 (27.5)
Preoperative PFMT	165 (54.6)
Urodynamic diagnoses	169 (56.0)
USI	76 (25.2)
DO	36 (11.9)
Voiding dysfunction	52 (17.2)

Abbreviations: BMI= body mass index; PFMT = pelvic floor muscle training; USI = urodynamic stress incontinence; DO = detrusor overactivity

Data presented as mean ± standard deviation (SD) or number (%)

constipation, difficult bowel evacuation, need for vaginal digitation and fecal incontinence (Table 2). Half of those (56.8%) who were still sexually active also complained of difficulty having sex. Three hundred out of 302 women (99.3%) were found to have posterior vaginal prolapse ≥ stage II and 131 women (43.4%) with apical descent ≥ stage II (Table 5).

The average operative time for all carried out procedures was 87 ± 21 minutes (range 30-180 minutes) and the mean blood loss was 135 ± 105 ml (range 10-500 ml) (Table 3). Hysterectomy was performed at the time of mesh placement in 13 cases (4.3%). Other concomitant procedures comprised anterior fascial colporrhaphy (36.8%), anterior vaginal mesh augmentation (51.7%), laparoscopic sacrocolpo/hysteropexy (1%), mid-urethral sling (26.2%) and cervicoplasty (5.3%). While intra-operative bleeding ≥ 500 ml occurred in 9 out of 302 cases (3%), none required blood transfusion. Bladder perforation was encountered in 3 women who had undergone concurrent Elevate Anterior and Apical mesh implantation for anterior vaginal prolapse. All were effectively treated with intra-operative watertight repair and extended catheterization.

Voiding difficulty was the most common early postoperative adverse event found in 15 women, 7 of whom had concurrent sling procedures. De novo stress incontinence was reported by 36 out of 302 women (11.9 %), 9 of whom required surgical treatment with mid-urethral sling, the remainders were managed conservatively. Other postoperative complications included de novo urge incontinence (5 %), deep vaginal or buttock pain (4.6 %), dyspareunia (2.3 %), groin pain (1.7 %) and deep venous thrombosis (0.3 %). Three cases (1 %) of vaginal mesh extrusion were discovered, one on the posterior upper and two on the posterior lower vaginal wall with a median onset of 151 days (range 130-190 days). Following conservative treatment, surgical mesh excision was eventually performed as day-procedure in 2 women.

TABLE 2. Clinical presentations for pelvic organ prolapse (N = 302).

Presenting symptoms	N (%)
Prolapse-related	301 (99.7)
Bulging	296 (98.0)
Dragging	181 (59.9)
Backache	76 (25.2)
Urinary	271 (89.7)
Stress incontinence	165 (54.6)
Overactive bladder	233 (77.2)
Voiding difficulty	194 (64.2)
Defecatory	227 (75.2)
Difficult evacuation	180 (59.6)
Constipation/straining	177 (58.6)
Vaginal digitation	63 (20.9)
Fecal urgency/incontinence	53 (17.5)
Sexual difficulty	121 (40.1)

Data presented as number (%)

TABLE 3. Surgical outcomes and peri-operative complications (N = 302).

Variables	Mean ± SD or n (%)
Estimated blood loss (ml)	135 ± 105
Operative time (minutes)	87 ± 21
Concomitant procedures	
Hysterectomy	13 (4.3)
Anterior vaginal repair	111 (36.8)
Anterior vaginal mesh	156 (51.7)
Sacrocolpo/hysteropexy	3 (1.0)
Mid-urethral sling	79 (26.2)
Cervicoplasty	16 (5.3)
Intra-operative complication	
Bleeding (≥ 500 ml)	9 (3.0)
Bladder injury	3 (1.0)
Post-operative complications	
Bleeding/hematoma	9 (3.0)
Voiding difficulty	15 (5.0)
Fever	3 (1.0)
Urinary tract infection	12 (4.0)
Wound infection	1 (0.3)
de novo SUI	36 (11.9)
de novo urge	15 (5.0)
Deep vaginal/buttock pain	14 (4.6)
Groin pain	5 (1.7)
Dyspareunia	7 (2.3)
DVT/PE	1 (0.3)
Mesh extrusion	3 (1.0)

Abbreviations: SUI = stress urinary incontinence; DVT = deep venous thrombosis; PE = pulmonary embolism
Data are presented as mean ± standard deviation or number (%)

The mean follow-up time was 28 months, ranging from 1 month up to 5.9 years. A total of 292 women (96.7 %) returned for 6-week postoperative visit. Those who missed the early postoperative follow-up ultimately returned at one year. Sixteen women who came back for the 6-week follow-up failed to return at 12 months. Among these, two withdrew consent, two died from underlying medical problems, two moved to nursing home, one relocated overseas and the rest lived far away and were unable to travel due to long distance. Of the 286 out of 302 women (94.7 %) who returned for 12-month follow-up, improvement was noted in terms of prolapse-related symptoms (99 %), urinary (89 %), bowel (91 %) and sexual functions (74 %). Five out of eighty-nine women (5.6 %) who were not sexually active at baseline were able to resume sexual activity at 1-year follow-up. Postoperative evaluation of prolapse quality of life (P-QOL) scores revealed excellent results in all aspects (Table 4). All POP-Q measurements except total vaginal length (TVL) were significantly improved (Table 5). Using the hymenal level as the cut-off point to define prolapse recurrence (Ap, Bp and C > 0), three women were found to have recurrent posterior compartment defect whereas seven women were discovered with recurrent apical prolapse. If those who missed the 12-month postoperative follow-up were assumed as 'failures', the objective cure rates of the Elevate Posterior and Apical mesh system in the treatment of posterior vaginal and apical prolapse were 93.7 % (283/302) and 92.4 % (279/302) respectively (Table 6). Among three women with recurrent posterior vaginal prolapse, two later underwent posterior fascial colporrhaphy while one had laparoscopic sacrocolpopexy due to defect combination. For seven women with recurrent apical prolapse, six required laparoscopic sacrocolpo/hysteropexy while one underwent Elevate Anterior and Apical mesh repair to correct both anterior and apical defects. Postoperative anterior vaginal prolapse was discovered in 12 women, 10 of whom had already undergone either concomitant anterior fascial repair or Elevate Anterior mesh repair.

DISCUSSION

The use of mesh remains controversial as evidenced by statements from several international societies such as ACOG, IUGA and AUGS. To date, there is no evidence to support its use in the posterior compartment from the 2013 Cochrane review, based on the lack of difference in prolapse awareness between the native tissue repair group and the transvaginal mesh group.[5] However, there are several reasons why alternatives to traditional fascial repair should be considered as an option for patients. Posterior colporrhaphy has been associated with a high incidence of dyspareunia, sexual dysfunction and bowel complications post-operatively, such as incomplete bowel emptying and fecal incontinence.[4,12] In addition, the current evidence lacks high quality studies, particularly in the surgical treatment of posterior prolapse. From the findings in this current series, our results do support the Posterior Elevate mesh technique as feasible, safe and anatomically sound.

From the safety perspective, one of the foremost concerning complications with transvaginal mesh repair is mesh erosion. To the best of our knowledge, with 3 out of 302 (incidence of 1 %) women experiencing mesh exposure after 1 year, this is the lowest extrusion rate reported to date compared to incidence of 2% to 6.5% among other Elevate Posterior and Apical mesh series.[6,13-14] Overall, the mesh extrusion rate of Posterior

TABLE 4. Pre- and post-operative P-QOL questionnaire.

	Baseline scores	12-month scores	*P* value
Overall P-QOL score	2.0 ± 0.9	0.9 ± 1.0	< 0.001
Role limitations	1.1 ± 1.1	0.4 ± 0.7	< 0.001
Physical limitations	1.3 ± 1.0	0.5 ± 0.8	< 0.001
Social limitations	0.6 ± 0.9	0.3 ± 0.6	0.018
Personal relationship	0.9 ± 1.0	0.3 ± 0.8	< 0.001
Emotion	1.2 ± 0.9	0.4 ± 0.8	< 0.001
Sleep/energy	1.1 ± 0.9	0.6 ± 0.9	< 0.001

Data are presented as mean ± standard deviation

TABLE 5. Comparison between pre- and post-operative POP location and stage.

POP variables	Pre-operative	Post-operative	*P*-value
Aa	+0.8 ± 1.7	-2.3 ± 1.0	< 0.001
Ba	+1.1 ± 1.8	-2.2 ± 1.1	< 0.001
C	-2.0 ± 3.3	-6.7 ± 2.0	< 0.001
Ap	+1.4 ± 1.3	-2.8 ± 0.5	< 0.001
Bp	+1.6 ± 1.4	-2.8 ± 0.5	< 0.001
gh	5.8 ± 1.1	4.3 ± 0.6	< 0.001
pb	1.3 ± 0.7	2.2 ± 0.5	< 0.001
tvl	8.7 ± 0.9	8.7 ± 0.8	0.570
Posterior			
Stage 0 or I	2 (0.7)	275 (91.1)	
Stage II	113 (37.4)	27 (8.9)	
Stage III	185 (61.2)	-	
Stage IV	2 (0.7)	-	
Total	302 (100)	302 (100)	
Apical			
Stage 0 or I	171 (56.6)	273 (90.4)	
Stage II	80 (26.5)	25 (8.3)	
Stage III	48 (15.9)	3 (1.0)	
Stage IV	3 (1.0)	1 (0.3)	
Total	302 (100)	302 (100)	

Data are presented as mean ± standard deviation or number (%)

TABLE 6. Clinical outcomes at 1-year follow-up.

Follow-up	6-week	1-year	Cumulative
Return for follow-up	292 (96.7)	286 (94.7)	286 (94.7)
Recurrence			
Posterior	0 (0.0)	3 (1.0)	3 (1.0)
			19 (6.3)
Apical	1 (0.3)	6 (2.1)	7 (2.4)
			23 (7.6)
Objective cure			
Posterior	100 %	99 %	99.0 %
			93.7 %
Apical	99.7 %	97.9 %	97.6 %
			92.4 %

Data are presented as number (%)

Elevate is much lower than the published extrusion rates of other mesh kits, such as Prolift (11%) and Apogee (11%).[15] It is therefore reassuring to note that in our series, a 1% mesh erosion rate is lower than the erosion rate of sacrocolpopexy (4%).[16]

The second major concern with the use of a polypropylene mesh in the vagina is related to the risk of pain and dyspareunia postoperatively. In our series, 2.3% and 4.6% of women reported dyspaneuria and deep vaginal or buttock pain respectively, similar to those described by Lukban et al (2.9%) and Su, Tsung-Hsien et al (4 %).[6,15] However, these symptoms tend to be short-lasting, with no major impact on sexual activity and quality of life reported among the patients who experienced dyspareunia, based on the P-QOL questionnaire. Remarkably, three-fourths of our patients (74 %) reported noticeable improvement in their sexual function after the Elevate Posterior and Apical mesh placement. This sharply contrasts with studies which have looked specifically at sexual function after trocar-guided mesh placement. Su et al reported worsening sexual function (73 %) at 6-month follow-up after Prolift mesh repair based on Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire (PISQ-12).[17] Deterioration in sexual function (baseline score 15.5 VS postoperative score 11.7; $p < 0.001$) was also demonstrated in a prospective multi-center study by Altman et al, using the short form PISQ-12 before and one year after trocar-guided transvaginal mesh surgery.[18]

With regard to intra-operative morbidities, while transvaginal mesh application has been associated with greater blood loss and organ injury risk, in our series, we encountered no rectal or visceral injury and low incidence of bleeding complication. Nine women experienced intraoperative blood loss over 500 ml, four was from pararectal space dissection and five from paravesical space dissection during concomitant Anterior Elevate mesh placement. All bleeding was adequately controlled and no blood transfusion was required. Possible explanations for the low incidence of mesh erosion, postoperative pain and surgical morbidity in our series include softer and lighter mesh property, single-incision trocarless technique, appropriate tensioning during placement, full thickness vaginal dissection and surgeon's experience.

In relation to bladder function, voiding difficulty was observed amongst 5 % of our patients, all of which spontaneously resolved within six weeks. This is notably less prevalent when compared to the 31% rate from a prospective cohort study on trocar-guided mesh repair by Zhang et al.[19] De novo urge incontinence was also reported in 5% of women. This was conservatively managed with lifestyle modification, bladder re-training and vaginal estrogen, with only one patient subsequently confirmed to have detrusor overactivity by urodynamic testing requiring anti-cholinergic medication. At 12-month follow-up, de novo stress incontinence was identified in 36 out of 302 women (11.9 %). Our result is more comparable to the 7.7 % incidence determined by Jundt et al[20] than the exceptionally higher incidence of 43 % demonstrated by the OPUS trial.[21] Most women were not concerned of their stress urinary leakage and were able to perform Kegel exercise to help relieve the symptom. Only 9 out of 36 required subsequent anti-incontinence surgery.

From the anatomical support point of view, at one-year analysis, the Elevate Posterior and Apical mesh system performed at our center has demonstrated high objective cure rates at 93.7% and 92.4% for the treatment of posterior vaginal and apical prolapse. Our results are consistent with those obtained from both single-incision trocarless and trocar-based mesh studies. Published data on the Elevate Posterior and Apical mesh regarding its support in the posterior and apical compartment show 92.5% and 89.2% success at one year in a prospective study by Lukban et al[6], 99% and 94% after two years in a retrospective study by Huang et al[13], and 100% and 99% in a cohort study by Su et al.[14] Similarly, Prolift demonstrated 95.9% and 93.7% success rates in the posterior and apical compartments in a study by Withagen et al[22], and Apogee's objective cure rate approached 96% in a long term trial by Karmakar et al.[23] Anatomic cure after transvaginal free graft placement displayed almost identical figures. At a median follow-up of 22.7 months, de Tayrac et al identified an objective cure rate of 92.3 % after rectocele repair with bilateral sacrospinous ligament anchored polypropylene mesh.[24] Better anatomical and functional outcomes were also described in a retrospective cohort study by Cao et al comparing modified pelvic floor reconstructive surgery using precut polypropylene mesh and traditional anterior posterior colporrhaphy (88.1 % VS 64.9 %).[25]

Limitations in this study include the absence of randomization, the possibility of assessment bias and the short-term follow-up. However, our research has the advantages of having a large study population from a single center where one surgeon performs or supervises all the repairs. Patient selection is therefore consistent, and surgical technique standardized and systematic in every patient, especially pertaining to proper vaginal dissection and placement and tensioning of the mesh anchor points.

In conclusion, at one-year follow-up, this Elevate

Posterior and Apical mesh series has delivered impressive clinical outcomes including high success rates, anatomic durability, improved quality of life, low recurrence rates and low mesh-related complications for the treatment of both posterior vaginal and apical prolapse. Therefore, it is reasonable to advocate continuing research and refinement of the role of mesh in prolapse management in the hope of offering women surgical options which can deliver safe and improved anatomical and functional outcomes.

ACKNOWLEDGMENTS

The authors declare that they have no Financial Disclaimer/Conflict of Interest.

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