

**PREOPERATIVE INFORMATION ON  
LAPAROSCOPIC SACROCOLPOPEXY**

Desert Women's Care is a strong proponent of minimally invasive surgery particularly in the treatment of women affected by significant vaginal vault prolapse. Our data on this procedure is presented.

**Non-Robotic Minimally Invasive Sacro-Colpopexy<sup>a</sup>**

Study period	One <sup>b</sup>		Two <sup>c</sup>	
Total patients	154		117	
Total patients successfully completing MIS <sup>d</sup> (%)	154	(100.0)	117	(100.0)
<b>--Demographics</b>				
--age	54	(39-82)	57	(46-78)
--parity	3	( 1- 8)	3	( 2- 9)
--BMI	32	(22-54)	30	(28-46)
--chronic HRT (%)	79	(51.63)	45	(38.46)
--pre-op vaginal estrogen (%)	107	(69.93)	110	(94.02)
--Charlson Comorbidity Index				
0	106	(69.28)	78	(66.67)
1	29	(18.95)	17	(14.53)
≥2	18	(11.76)	22	(18.80)
--prior hysterectomy <sup>e</sup> (%)	153	(100.0)	117	(100.0)
--prior reconstructive pelvic procedure (%)	58	(37.91)	35	(29.91)
<b>--Operative Times (min)</b>				
--sacrocolpopexy time	140	(89-211)	104	(79-189)
--other procedure(s)	38	(20-63)	43	(22-54)
--anesthesia time	209	(120-295)	175	(91-282)
<b>--Other Procedures</b>				
--lysis of adhesions	38	24.84%	25	21.36%
--TVT <sup>f</sup>	3	1.95%	0	0.00%
--TOT <sup>f</sup>	60	38.96%	85	72.65%
--paravaginal repair <sup>f</sup>	74	48.05%	1	0.85%
--anterior repair	15	9.80%	17	14.53%
--anterior Vaginal Mesh repair	9	5.89%	10	8.55%
--posterior repair	16	7.11%	6	5.13%
--posterior Vaginal Mesh repair	5	3.27%	2	1.71%
--oophorectomy / bso	6	3.92%	0	0.00%
--unlisted procedure	9	5.89%	7	5.98%

--Post-Operative Stay				
--out-patient only	28	18.30%	85	72.65%
--one hospital day	120	78.43%	30	25.64%
--two or more hospital days	5	3.27%	2	1.71%
--average post-op stay <sup>g</sup> (hrs)	26		9	
--Complications: Non-Reoperated Cases				
--febrile morbidity				
--urinary tract infection	9	5.88%	5	4.27%
--pneumonia	2	1.31%	0	0.00%
--peritonitis	3	1.96%	0	0.00%
--injury to bowel	0	0.00%	0	0.00%
--injury to bladder	2	1.30%	0	0.00%
--injury to ureter	0	0.00%	0	0.00%
--injury to major vessels	0	0.00%	0	0.00%
--deep vein thrombosis	0	0.00%	1	0.85%
--pulmonary embolism	0	0.09%	0	0.00%
--port site hernia	1	0.65%	0	0.00%
--death	0	0.00%	0	0.00%
--Complications: Re-operated Cases				
--post-operative hemorrhage	2	1.30%	0	0.00%
--injury to bowel	0	0.00%	0	0.00%
--injury to bladder	0	0.00%	0	0.00%
--injury to ureter	0	0.09%	0	0.00%
--urinary tract fistula	0	0.00%	0	0.00%

--Effect of surgery

	-----Baseline-----		-----6 Months-----	
	Heaney Handle	Rumi Handle	Heaney Handle	Rumi Handle
	(n=154)	(n=117)	(n=140)	(n=110)
POP-Q Stage				
0-1	0 ( 0.0 %)	0 ( 0.00 %)	134 (95.71 %)	102 (92.72 %)
2	11 ( 6.54 %)	2 ( 1.71 %)	6 ( 4.29 %)	7 ( 6.36 %)
3	115 (75.16 %)	78 (66.67 %)	0 ( 0.00 %)	0 ( 0.00 %)
4	28 (18.30 %)	37 (31.62 %)	0 ( 0.00 %)	1 ( 0.92 %)

- a. Consecutive surgeries from January 1, 2003, through February 28, 2014. Surgeries performed at: 1.) Arizona Regional Medical Center, Mesa and Apache Junction, AZ; 2.) Gilbert Hospital, Gilbert, AZ; 3.) Arizona Surgical Specialists' Center, Tempe, AZ; 4.) Tempe St. Luke's Hospital, Tempe, AZ; 5.) Phoenix St. Luke's Hospital, Phoenix, AZ; 6.) Poplar Creek Surgical Center, Hoffman Estates, IL; and 7.) Provena St. Joseph Hospital, Elgin, IL.
- b. Study period One—Heaney retractor Handle as used to distend and manipulate the vaginal barrel for vagino-sacropexy and a tenaculum was used for vagino-cervico-sacropexy.

- c. Study period Two— Sacrocolpopexy or Cervico-Sacrocolpopexy tip on Rumi handle from Cooper Surgical were used to distend and manipulate the vaginal barrel.
- d. Cases without conversion to laparotomy.
- e. These cases exclude women having hysterectomy or supracervical hysterectomy during the referenced anesthetic.
- f. Procedures performed for stress urinary incontinence.
- g. Hours after transfer to post-anesthesia care unit.

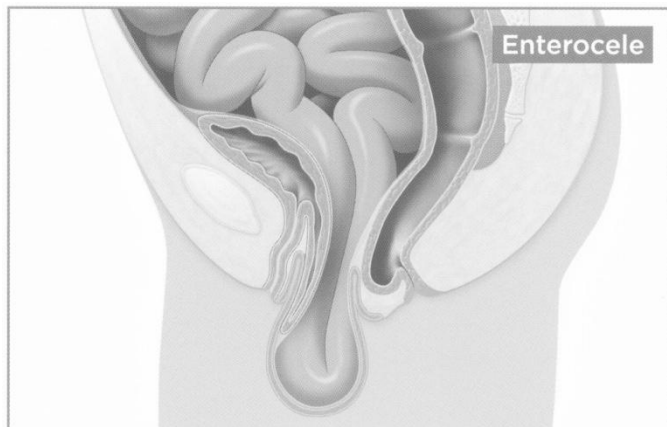
### Apical Defect—

Enterocoele or vaginal vault prolapse is most often corrected with Vagino-Sacropexy. Apical defect is likened to a pocket turning inside out. Two main surgical corrections for this condition are available: Vaginal Sacro-Spinous Ligament fixation and laparoscopic / robotic vagino-sacropexy.

Sacro-Spinous fixation is an older procedure wherein a pulley stitch is put through a defect in the posterior, apex of the vagina and affixed to the sacro-spinous ligament. The suture is tensioned and the apex closed. Potential for injury to bowel with this fairly blind procedure exists. The vagina deviates toward the patient's right side and is not in the midline. Breakdown is possible as the apex does not have as wide a base of support as with contemporary mesh procedures. Recurrence rate of prolapse is higher with this procedure than vagino-sacropexy.<sup>1</sup>

Vagino-Sacropexy or Sacrocolpopexy is currently the gold standard therapy for apical vaginal vault prolapse.<sup>2-3</sup> A "Y" shaped polypropylene mesh is affixed to the anterior and posterior vaginal barrel after parietal peritoneum is dissected free and the bladder flap is reduced. The arm of the "Y" is then tacked to the sacral promontory after the retroperitoneum is opened.

Pre-operative treatment includes use of estrogen cream in the vagina to thicken the mucosa. This will be continued afterwards for several months to assist in healing. The mesh is retroperitonealized after placement and any "windows" are closed so as to preclude any internal hernia of bowel or omentum with healing.<sup>4</sup> Patients should avoid val salva and abdominal exercise for twelve weeks to permit optimal healing to occur. The likelihood of mesh erosion is 5%.



## Sacrocolpopexy with prophylactic procedure for Stress Incontinence—

Data exists suggesting that occult cases of Stress Urinary Incontinence (SUI) can progress to overt SUI after correction of vaginal prolapse. In the Colpopexy and Urinary Reduction Efforts (CARE) trial, women without SUI symptoms with stage II to IV prolapse who were planning sacrocolpopexy were randomly assigned to undergo sacrocolpopexy with or without Burch colposuspension.<sup>5-7</sup> Women with advanced pelvic organ prolapsed (POP) who were continent before surgery, prophylactic Burch colposuspension at the time of abdominal sacrocolpopexy reduced postoperative SUI. At 24-month follow-up, the prevalence of stress incontinence was significantly lower in the Burch versus no Burch group (32 and 45 percent).

Liang, et al, published a prospective study of 79 continent women, 49 of whom had positive testing for occult SUI testing prior to prolapse repair surgery with or without tension-free vaginal tape midurethral sling (TVT).<sup>8</sup> Among these women, the rate of postoperative de novo SUI was significantly decreased in the women in the TVT versus no TVT group (10 versus 65 percent). Women with negative occult SUI testing did not undergo TVT and none developed SUI postoperatively.

Because of these data, DWC Surgeons often choose to place a mid-urethral sling when sacrocolpopexy is performed for correction of significant pelvic prolapse. Meaningful enhancement of life quality following apical vaginal prolapse correction with sacrocolpopexy is well recognized.<sup>9</sup>

**Risks with Elevated Weight (Body Mass Index)**

Careful examination of our data showed no statistical association between increasing BMI and failure to successfully complete laparoscopic Sacrocolpopexy:

<b>Patient Wt (BMI)—</b>	
< 18.5	0 / 11
18.5 – 24.9	0 / 44
25.0 – 29.9	0 / 77
30.0 – 34.9	0 / 18
> 35.0	0 / 4
<b>Grand Total</b>	<b>0 / 154</b>

Desert Women's Care surgeons are experienced in treatment of women with elevated BMI and do not believe that this is a contraindication for laparoscopic sacrocolpopexy. In fact, we believe that elevated BMI itself is an indication for laparoscopic surgery as opposed to open laparotomy with its increased morbidity and mortality risks.

**Complications related to Sacro - Colpopexy**

There are many potential complications including death related to the use of general anesthesia. The vast majority of women do not have major complications from anesthesia in the contemporary period, however, and most complications arise in individuals who are considered poor medical risks for surgery pre-operatively. Aspiration pneumonia can occur so that it is very important that patients remain N.P.O. (nothing by mouth) after midnight the night prior to surgery. Eliminating food for several hours preoperatively reduces but does not eliminate the possibility of aspiration pneumonia.

A vast array of potential complications are related to the surgical procedure itself. They are outlined in the table below:

**GRID OF POTENTIAL COMPLICATIONS RELATED TO SACROCOLPOPEXY****Intra-Operative Complications<sup>a</sup>**

- injury to bowel
- possible colostomy
- injury to bladder
- injury to ureters
- possible nephrostomy
- retroperitoneal hematoma
- injury to major vessels
- require transfusion
- thermal injury
- CO2 embolism
- failed intubation
- sore throat
- may require laparotomy
- hypovolemia or hypoperfusion with or without anoxia injury

**Immediate Post-Operative Complications<sup>ab</sup>**

- febrile morbidity
  - a. UTI
  - b. Pneumonia
  - c. Peritonitis
- tubo-ovarian abscess
- wound infection
- graft failure
- deep vein thrombosis
- pulmonary embolism
- septicemia
- death
- hip / leg pain from surgical positioning

**Late Post-Operative Complications**

- Mesh erosion
- Port Site hernia
- possible re-operation
- other unspecified complications

(a) listed complications may or may not require intra-operative laparotomy, admission to a hospital or may lead to additional diagnostic or surgical procedures at a later date

(b) TVH: Total vaginal hysterectomy; TAH: Total abdominal hysterectomy; CLH: Complete laparoscopic hysterectomy; LSH: Laparoscopic surpa-cervical hysterectomy; and EH: Extended hysterectomy

**Disposition of Adnexal Structures at The Time of Sacrocolpopexy**

Consideration must be given to what to do with ovaries and tubes at the time of sacrocolpopexy.

**Oophorectomy—**

Women at High-Risk of ovarian Cancer based on family history and BRCA1 or BRCA2 mutations should undergo bilateral salpingo-oophorectomy at the time of sacrocolpopexy.<sup>10</sup> Often his surgery has already been done at the completion or childbearing. There are also a large number of low-penetrance genetic variants that account for women who have a strong family history for ovarian cancer but do not have the BRCA1 or 2 genes.<sup>11</sup> These women should also have oophorectomy.

The data is quite different for women at Average Risk of Ovarian Cancer. Safety of ovarian conservation was recently addressed in by Parker and colleagues.<sup>12-13</sup> The Nurses' Health Study (NHS) demonstrated various downsides to elective bilateral oophorectomy in association with benign hysterectomy: 1.) 12% increase in all-cause mortality; 2.) 27% increase in death from coronary artery disease; 3.) 31% increase in death from lung cancer, and, 4.) 17% increase in total cancer-related mortality. These findings were arrived at after twenty-four years of follow up.

DWC advocates retention of ovaries, when no ovarian pathology is observed intra-operatively, at the time of sacrocolpopexy.

**Oophorectomy for prevention of ovarian cancer in elderly women at average risk—**

Thought has been given to an age at which the benefits of oophorectomy to prevent development of ovarian cancer outweighs the increased risk of Coronary Heart Disease, neurologic conditions and overall mortality in average risk women associated with surgical castration. The risk of ovarian cancer increases with advancing age but peaks at 75 years.

Parker published a computer modeling study in which conservation of ovaries was recommended up to age 65 years.<sup>14</sup>

No clear consensus on this recommendation exists today amongst other authorities.

### **Disposition of Tubes at Time of Sacrocolpopexy—**

Current recommendations favor bilateral salpingectomy at the time of benign hysterectomy to decrease the likelihood for future development of epithelial ovarian cancer (incidence of germ cell and stromal tumors will remain unaffected).

The ovary is now known to contain no epithelial cells.<sup>15</sup> Seventy percent of epithelial ovarian cancers are the serous, high grade and clinically aggressive type. Almost all such lesions are associated with the p53 genetic mutation. Cancer precursor lesions called serous tubal intraepithelial cancer (STIC) have been found in the fallopian tube but have never been found in the ovary. Many STIC lesions have p53 mutations matching those found in high grade squamous epithelial ovarian cancer. No p53 mutations have been isolated from low grade cancer found inside the ovary (Stage 1 disease). This has caused scientists to believe aggressive squamous epithelial cancer of the ovary actually arises from the fallopian tube.

Some scientists wondered whether bilateral salpingectomy would damage the vascularization of the ovary and compromise ovarian function or lead to early ovarian failure. A 2013 study confirmed no change in antral follicle count, ovarian dimensions, anti-mullerian hormone or follicle stimulating hormone levels three months post bilateral salpingectomy compared with pre-operative levels.<sup>16</sup>

Because of the relationship between the fallopian tube and high grade epithelial cancer, the Society of Gynecologic Oncology (SGO) in November, 2013, published their recommendation for removal of fallopian tubes during other gynecologic surgery.<sup>17</sup>

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