

## PREDICTING WHETHER CONCOMITANT ANTERIOR AND/OR POSTERIOR REPAIRS WILL NEED TO BE PERFORMED AT TIME OF UTEROSACRAL LIGAMENT SUSPENSION

### Hypothesis / aims of study

Some surgeons routinely perform anterior repair (AR) and posterior repair (PR) with uterosacral ligament suspension (USLS) and others reassess anatomy after USLS. Published reports describe AR in 61.9-76.9% and PR in 52.5-54.7% of USLS cases [1,2]. Although USLS is primarily designed to treat apical prolapse, it often impacts prolapse in the anterior and posterior compartments as well. Simulated apical support has been shown to resolve 55% of anterior prolapse and 30% of posterior prolapse [3]. For this reason, some surgeons will reassess anatomy after the USLS is complete and then decide whether AR and/or PR is necessary. This creates a conundrum for surgeons and patients alike regarding preoperative counseling discussions as well as scheduling appropriate operative time. Our objective was to identify variables predictive of performing AR/PR at time of USLS.

### Study design, materials and methods

A retrospectively collected surgical database of all USLS procedures performed from 2011 to 2014 at an academic medical center was used to compare three distinct groups:

1. AR vs. no AR
2. PR vs. no PR
3. AR and/or PR vs. neither

Logistic regression identified variables predictive of each grouping, as surgical risks and consequently preoperative counseling are different for each procedure. All variables with  $p < 0.2$  on univariable regression were candidate variables for multivariable regressions fit with backward removal. With concerns for overfitting using all surgeons, surgeons were categorized as low/medium/high performers of AR/PR, but odds ratios (OR) were not reported as this was inherently predictive. All variance inflation factors were  $< 2.50$ , excluding excess multicollinearity with this method. Receiver operator curve (ROC) analysis generated cut-points where surgeons performed AR/PR. Linear regression identified factors associated with increased operative time.

### Results

During the study period, 191 women underwent USLS, 57 (29.8%) vaginally and 134 (70.2%) laparoscopically ( $\pm$ robotic assistance). Seven surgeons performed a median of 25 cases. Women were predominantly white (97.4%) with stage III prolapse (58.1%),  $61.2 \pm 11.7$  years old and BMI  $28.3 \pm 5.5$ . Operative time was  $178.4 \pm 49.2$  minutes (min). Concomitant procedures included hysterectomy (90.1%), salpingo-oophorectomy (28.3%), and midurethral sling (17.3%). AR was performed in 52 (27.2%), PR in 112 (58.6%), and one or both in 131 (68.6%). Preoperative variables predictive of AR were age, POP-Q point Aa, and obesity (Table). Variables predictive of PR were Ap and stress urinary incontinence (SUI). Only point C predicted AR and/or PR. No past medical/surgical/gynecologic history variables were predictive in any model. ROC analysis showed cut points predicting procedures were  $Aa \geq +0.25$  for AR,  $Ap \geq -1.75$  for PR, and  $C \geq -4.25$  for AR and/or PR. There were no useful cut-points for other predictors. Linear regression showed conversion to laparotomy (69.4min), hysterectomy (42.2min), laparoscopic vs. vaginal approach (21.0min), midurethral sling (19.6min), prior abdominopelvic surgery (12.6min), and BMI (2.3min per unit) increased OR time (all  $p < 0.05$ ). AR, PR, and AR/PR did not significantly increase OR time.

Table: Multivariable Logistic Regression for Additional Surgery Being Performed

Model Outcome	Variable	Adjusted Odds Ratio	95% Confidence Interval
Anterior Repair Only	Age (per year)	1.091	1.037-1.145
	Preoperative POP-Q Point Aa (per cm)	1.471	1.130-1.916
	Obese (BMI > 30 kg/m <sup>2</sup> )	2.828	1.198-6.672
	Vaginal Route	3.047	0.995-9.327
Posterior Repair Only	Surgeon Category for Likelihood of Performing Anterior Repair	#	#
	Preoperative POP-Q Point Ap (per cm)	1.603	1.192-2.155
	Preoperative Stress Urinary Incontinence	2.967	1.451-6.061
Anterior and/or Posterior Repair	Surgeon Category for Likelihood of Performing Posterior Repair	#	#
	Preoperative POP-Q Point C (per cm)	1.147	1.036-1.269
	Surgeon Category for Likelihood of Performing Anterior and/or Posterior Repair	#	#

BMI= Body Mass Index

POP-Q= Pelvic Organ Prolapse Quantification

#: Odds ratios/confidence intervals not reported for surgeon category as variable is inherently associated with outcome. See methods section for further discussion on why it was included in regression models.

#### Interpretation of results

We identified 6 predictors of performing AR, PR, or AR/PR. Of these, 3 were somewhat intuitive POP-Q points, but predictive cut-points aid preoperative counseling. Since performing AR, PR, and AR/PR did not increase OR time, surgical planning is likely less impacted.

#### Concluding message

Our objective was to determine factors which help predict the need for AR, PR, or AR/PR at time of USLS. The need for AR, PR, or AR/PR can be predicted by 3 baseline POPQ points. Increasing age, obesity, and POP-Q point Aa  $\geq +0.25$  are associated with performance of an AR. Patients with preoperative SUI and POP-Q point Ap  $\geq -1.75$  are more likely to have PR. Only increasing POP-Q point C  $\geq -4.25$  was associated with anterior and/or posterior repair. Ultimately, we found very few predictors other than relevant POP-Q points and associated cut-points to guide in surgical planning and patient counseling. Even though our analysis showed performance of AR/PR does not impact OR time, we recommend that all patients should be counseled on the possibility of the need for these additional procedures.

#### References

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#### Disclosures

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