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PREDICTORS OF A FAILED VOIDING TRIAL AFTER SLING AND CONCOMITANT SURGERY

Hypothesis / aims of study: While discharge home with an indwelling urethral catheter was a routine practice in the past, many women are able to void soon after pubovaginal sling surgery. An indwelling catheter may be a source of perioperative infection and the prospect of discharge with a catheter may be a source of anxiety for women undergoing sling surgery. The aim of this study was to identify perioperative factors that could predict success or failure of the postoperative voiding trial.

Study design, materials and methods: After obtaining Institutional Review Board Approval, women who underwent pubovaginal sling and concomitant surgery at our institution were retrospectively identified. Inclusion criteria were: non-neurogenic incontinence, no indication for prolonged catheter drainage (e.g. concomitant diverticulectomy or vesicovaginal fistula repair, intraoperative cystotomy, or urethrotomy), complete preoperative video-urodynamic assessment (filling cystometrogram and pressure-flow study), and no retention requiring urethrolysis or sling revision. Women undergoing pubovaginal sling only were excluded. The voiding trial was performed per standard protocol on the morning of hospital discharge. Demographic factors included: age, race, body-mass index, parity, and severity of pelvic organ prolapse (Baden-Walker grade). Urodynamic factors included: Valsalva leak point pressure (VLPP), maximum cystometric bladder capacity (CBC), maximum flow rate, detrusor pressure at maximum flow, post void residual (PVR), voiding efficiency [1-(PVR/CBC); %], and presence of unstable detrusor contractions. Perioperative factors included sling type (autologous rectus fascia, porcine dermis, midurethral polypropylene) and route of concomitant surgery (vaginal, abdominal, and laparoscopic). Chi-square was used to make pairwise comparisons of outcome frequency. The relationship between multiple independent variables and outcome groups were compared using multiple regression analysis. All statistical analyses were conducted using MedCalc 9.3.2 software (Belgium), $p < 0.05$.

Results: Of 958 women, 584 met inclusion criteria. At time of voiding trial, all women were using only oral analgesics for pain control. Overall, 470 (80.5%) women passed the initial voiding trial. Sling type was not associated with voiding trial failure. Univariate analysis revealed that higher age ($p = 0.013$), higher parity ($p = 0.0071$), higher PVR ($p = 0.0006$), lower voiding efficiency ($p = 0.0013$), and concomitant prolapse (Baden-Walker ≥ 2) ($p = 0.0255$), were associated with voiding trial failure. Additionally, more women than expected failed a voiding trial after undergoing concomitant vaginal surgery with pubovaginal sling ($p < 0.0001$); however, fewer women than expected failed a voiding trial who had concomitant abdominal surgery with sling ($p < 0.0001$) or concomitant abdominal and vaginal surgery at time of sling ($p < 0.0001$). Multivariate analysis (backward ANOVA, $p < 0.1$) revealed that age ($p = 0.0876$), parity ($p = 0.0357$), and voiding efficiency ($p = 0.0033$) remained significant.

Interpretation of results: Older age, higher parity, and incomplete bladder emptying appear to be risk factors for failing a voiding trial per our regimen. Additionally, concomitant vaginal surgery may also be associated with a higher rate of failed voiding trials, while concomitant abdominal surgery does not appear to be a risk factor. A temporary deleterious effect on the pelvic floor musculature is one theory for this discrepancy. Additionally, women undergoing abdominal surgery typically underwent voiding trial on the second postoperative day, as opposed to the first postoperative day for women undergoing vaginal surgery. An additional day of continuous bladder drainage may have improved the chances of passing a voiding trial. Despite this observation, a significant percentage of women undergoing vaginal surgery passed an initial voiding trial and should not be denied an attempt to go home without an indwelling catheter.

Concluding message: Women of increasing age and parity, along with decreasing voiding efficiency are at higher risk of failing a voiding trial after pubovaginal sling and additional surgery. This information may be useful in constructing a nomogram to identify women who may benefit from additional preoperative counselling and, perhaps, instruction in intermittent catheterization.

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Was this study approved by an ethics committee?	**Yes**
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Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**