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VAGINAL LENGTH: WHAT IS SIGNIFICANT?

<u>Hypothesis / aims of study</u>
Vaginal length, a common measurement in pelvic floor surgical studies, has been subject to few dedicated articles (or to our knowledge, ICS presentations) with few significant findings.
This study aims to examine the total vaginal length (TVL[1]- posterior vaginal vault to hymen – vaginal Levels I and II[2]) and the total posterior vaginal length (TPVL[3]- posterior vaginal vault to anterior perineum – vaginal Levels I,II,III[2]) prior to and immediately following posterior vaginal compartment repair (PR). These lengths are illustrated in the Figure. Significant associations will be sought.
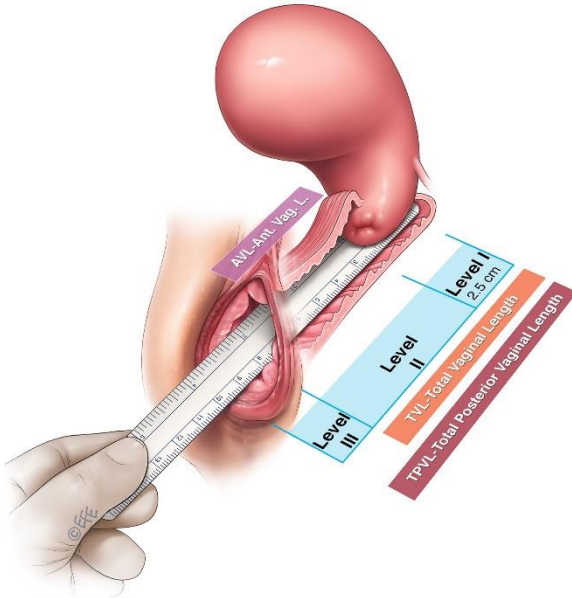
<u>Study design, materials and methods</u>
At 300 consecutive PRs, mostly following prior or concomitant hysterectomy, the (i) TVL[1] (mm) and TPVL[2,] (mm) were measured pre- and immediately postoperatively. Using linear regression, preoperative measurements were tested for their association with a range of demographic and surgical factors including: age; parity; weight; height; BMI, menopause, prior hysterectomy, POP-Q[1] (point C, Ap and Bp and genital hiatus -GH) and PR-Q[3,] (perineal gap - PG, posterior vaginal vault descent - PVVD, mid vaginal laxity – MVL undisplaced, rectovaginal fascial laxity - RVFL) measurements.

<u>Results</u>
Pre-op TPVL was a mean 92.5mm or a mean 17.6mm (23.5%) longer than pre-op TVL-74.9mm. Post-op TPVL was reduced by a mean 1.7mm (1.8%) to 90.8mm and TVL by a mean 0.8mm (1.1%), to 74.1mm, neither significant.
Table 1 shows associations with an outcome variable of total pre-operative TVL. Covariates with $P<0.05$ are shown in bold. The results for TPVL were essentially similar.
TVL and TPVL have a significant inverse relationship with age and menopause. Both lengths have a positive association with indices of body size (weight, height, BMI), with weight a stronger factor than height. There were no associations between TVL and TPVL and either parity or prior hysterectomy. Importantly, there was no significant impact of posterior vaginal compartment repair on vaginal length (TVL/TPVL).
In univariate analysis, TVL/TPVL had significant positive relationships with all the PR-Q[2,] prolapse markers (PG, PVVD, MVL undisplaced, RVFL) suggesting vaginal length may increase with prolapse. Their only relationship with the POP-Q markers (Point C) was a surprising inverse one. In multivariate analysis, only PVVD and RVFL (positive) and Point C (negative) still had relationships with TVL and TPVL.

Table 1: Associations with an outcome variable of total pre-operative vaginal length. Covariates with P<0.05 shown in bold. (LCI and UCI = lower 95% and upper 95% confidence intervals, respectively).

Covariate	Coef. (95%CI)*	P*
Age in years	**-0.40 (-0.53 to -0.27)**	**<0.001**
Weight in kg	**0.25 (0.11 – 0.33)**	**<0.001**
Height in cm	**0.42 (0.19 – 0.65)**	**<0.001**
BMI (kg/m^2)	**0.44 (0.12 – 0.77)**	**0.008**
Parity (per one birth)	0.17 (-1.22 – 1.57)	0.81
Perineal gap (mm)	**0.26 (0.09 – 0.42)**	**0.002**
PVVD (mm)	**0.18 (0.10 – 0.26)**	**<0.001**
MVL, undisplaced preop (mm)	**0.72 (0.48 – 0.95)**	**<0.001**
Rectovaginal Fascial Laxity (mm)	**0.60 (0.36 - 0.83)**	**<0.001**
Genital Hiatus (mm)	-0.002 (-0.18 – 0.17)	0.98
Point C (mm)	**-0.20 (-0.26 to -0.13)**	**<0.001**
Point Bp (mm)	-0.06 (-0.17 – 0.05)	0.30
Point Ap (mm)	-0.68 (-1.85 – 0.49)	0.25
Menopause (Yes versus no)	**-14.1 (-18.63 to – 9.44)**	**<0.001**
Hysterectomy (Yes versus no)	1.17 (-2.09 – 4.45)	0.40

Interpretation of results
TPVL is a mean 17.6mm (23.5%) longer than TVL. This represents the additional mean length of vaginal Level III. Neither length is reduced significantly by posterior vaginal compartment repairs. Both have significant inverse relationships with age, menopause and Point C. Both have significant positive relationships with weight, height, BMI and possibly prolapse (PR-Q[2,] markers only). Neither had a relationship with either parity or prior hysterectomy.

Concluding message
TPVL/TVL both have inverse relationships with age, menopause and Point C and positive relationships with weight, height, BMI and possibly prolapse (PR-Q prolapse markers only). Posterior vaginal compartment repair had no significant impact on vaginal length.

References
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Disclosures
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