

DUAL VAGINAL VAULT SUPPORT AT COLPORRHAPHY - AN ANATOMICAL BASIS FOR A FOUR-PART VAGINAL REPAIR

Hypothesis / aims of study

We aim to establish an anatomical argument for the simultaneous use of the uterosacral and sacrospinous ligaments to provide dual vaginal vault support at colporrhaphy. This is on the basis of: **(A)** the consideration of the top of the vagina as a "vault" or an "area" rather than as an "apex" or a "point", the former requiring wider or perhaps dual support; **(B)** the technical ability to use both ligaments concomitantly; **(C)** the different vectors through which these ligaments might synergize to provide that dual (and hopefully balanced) vaginal vault support;

Study design, materials and methods

(A) The top of the vagina is termed (1) a "vault" i.e. a "continuous arch" covering the vagina rather than an "apex" which is defined generically as "the highest point". Support to a "vault" implies that more than one direction of support might be necessary, perhaps as a minimum, anterior and posterior vault support.

(B) Midline plication of the uterosacral ligaments simultaneous with anterior colporrhaphy has been recently described (2) as providing anterior Levels 1 and 2 vaginal support. Sacrospinous colpopexy and posterior colporrhaphy has long been used to provide posterior Levels 1 and 2 vaginal support. Dual vaginal vault support is technically possible but anatomically untested.

(C) A study was made of 13 formalized cadaver hemipelves in our collection of teaching prosections. None had undergone hysterectomy or obvious pelvic floor repair surgery. Four observers were involved in the studies. In all cases, observations were made to determine (i) the vector of anatomical support provided by (a) traction on the uterosacral ligaments at a level of the vaginal vault and (b) traction on the posterior vaginal vault towards the (right) sacrospinous ligament. Additional observations (ii) were made of which vaginal walls were subject to increased tension as a result of the above traction. Traction was by forceps or sutures

Results

a: Traction on the **uterosacral** ligaments caused a **posterior and superior** vector of tension on the **anterior** vaginal vault (and wall) with minimal or no tension on the posterior vaginal vault (and wall).

b: Traction on the posterior vaginal wall (right side) towards the right **sacrospinous** ligament caused a **posterior and superior** vector of tension on the **posterior** vaginal vault (and wall) with minimal or no tension on the anterior vaginal vault (and wall). To a certain degree, it may be slightly lateral, dependent on the area of attachment of the supportive suture(s) to the ligament.

c: Traction on both the **uterosacral** ligaments and traction on the posterior vaginal vault towards the **sacrospinous** ligament created tension in both anterior and posterior vaginal walls and a more balanced elevation of the vaginal vault. Traction on the sacrospinous ligament was infero-lateral to that of by the uterosacral ligament

Interpretation of results

1: **Dual Uterosacral and Sacrospinous ligament traction** is technically possible to provide **dual** anterior and posterior support to the vaginal vault at colporrhaphy (anterior and posterior).

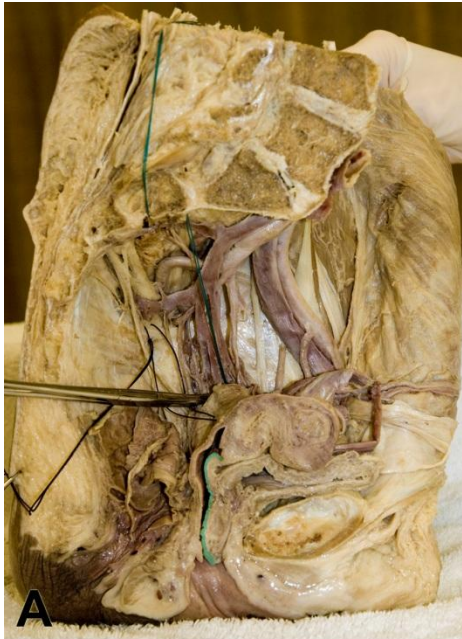
2: This dual vaginal vault support, **posterior and superior** (uterosacral) and also **posterior and superior** (sacrospinous) appears balanced and necessary for effective vaginal vault (and wall) support.

3: The use of anterior and posterior colporrhaphies and combined uterosacral and sacrospinous ligament support to the anterior and posterior aspects of the vaginal vault creates a **four-part vaginal repair** not previously described.

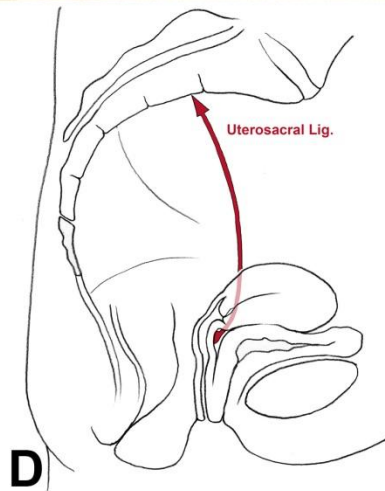
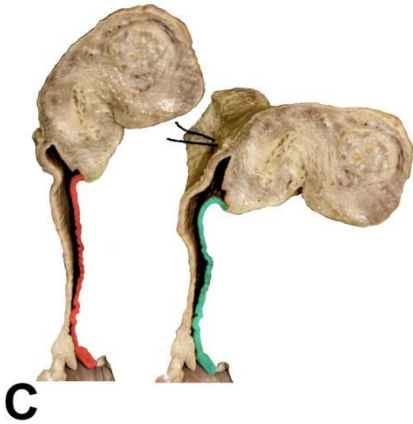
Concluding message

Dual vaginal vault support (uterosacral and sacrospinous ligaments) at anterior and posterior colporrhaphy is technically possible and appears anatomically desirable to achieve balanced postero-superior support for both anterior and posterior vaginal vault and walls.

FIGURE 1: Traction on the uterosacral ligaments causing a posterior and superior vector of tension principally on the anterior vaginal wall.



■ With Tension ■ Without Tension



References

1. Int Urogynecol J, 2010; 21:5-26.
2. Int Urogynecol J, 2011; 22:69-75

Specify source of funding or grant	Not applicable
Is this a clinical trial?	No
What were the subjects in the study?	HUMAN
Was this study approved by an ethics committee?	No
This study did not require ethics committee approval because	Observations on cadaver hemipelves in University Department of Anatomy's teaching collection.
Was the Declaration of Helsinki followed?	Yes
Was informed consent obtained from the patients?	No