

## Letter to the Editor

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## Posterior IVS for vault suspension: A re-evaluation

by BRUCE FARNSWORTH

Dr Farnsworth is to be complimented on an excellent historical summation. He has played a central role in simplifying the teaching of this technique. I endorse his comments on method and sterile technique, and would add, it is absolutely necessary to create a fascial layer below the tape. Approximation of suburethral or rectovaginal fascia will give a better symptomatic result, and vastly reduce tape rejections. Any direct contact with the tape on the incision will initiate the action of lytic enzymes, and may explain the high rejection rate reported by some surgeons.

I present some comments below which I hope will stimulate further debate.

### 1. THE CONTENTION THAT THE OPERATION IS A LEVEL 2 REPAIR.

The tape is inserted through the uterosacral ligaments. As the uterosacral ligaments attach to the posterior part of the cervix, the operation is by definition, a level 1 repair. The penetration point for the muscles is 1cm medial and posterior to the ischial spine.

The accompanying xray studies demonstrate that the ischial spine is above the cervix in the resting position, figure 1, and well above the cervix during straining, figure 2.

### 2. SUGGESTIONS BY OTHERS THAT THE TAPE SHOULD PENETRATE THE SACROSPINOUS LIGAMENT

I agree entirely with Dr Farnsworth, that the tape should not penetrate the sacrospinous ligament. This new trend has, I believe, 3 major flaws. Firstly, there would be increased risk of causing major haemorrhage by damage to the venous plexus below the sacrospinous ligament (SSL).<sup>2</sup> Secondly, a rigid attachment is created between vagina and SSL. This would inhibit the backward/downward stretching of vagina and bladder base by the levator muscles, evident on comparing figures 1 & 2. This movement restores support to the bladder base stretch receptors, a pre-requisite for the reported clinical cure of urgency, frequency and nocturia.<sup>3</sup> There is anecdotal evidence from surgeons in the field that the 80% cure rate reported for such symptoms<sup>3</sup> has halved with the use of large mesh systems which attach to the sacrospinous ligament.

However, his advice that "A separate apical attachment using independent permanent nonabsorbable sutures can be

placed on the posterior and medial end of the sacrospinous ligament on each side", is, I believe, a sacrospinous fixation (SSF) in all but name, something the "PIVS" or "infracoccygeal sacropexy"<sup>4</sup> was specifically designed to avoid.

Any excess stretching of the vagina during surgical attachment to the SSL would bring back the post-operative pain associated with sacrospinous fixation (SSF). Any sacrospinous fixation risks the vascular complications described by Nichols. A penetration point of the tunneller 1cm medial and behind the ischial spine is safer, allows greater muscle stretching of the organs, figure 2, and is potentially a less painful procedure than PIVS with a SSF component.

### 3. OTHER ISSUES

Speaking from an experience of >4000 IVS cases, I make the following observations. It is important to distinguish between "infection" and foreign body reaction. Both are inflammatory reactions, and both may present as purulent reactions. Patients with tape "rejections" are invariably afebrile. The presenting symptom is usually a painless purulent

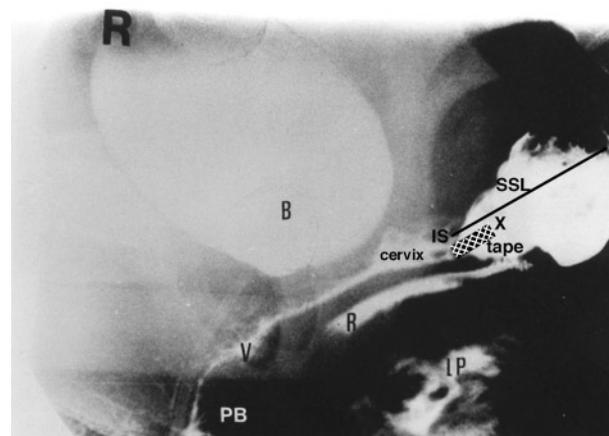


Fig. 1. – Xray of a nulliparous patient, resting sitting position. Note that the cervix is situated just below the level of the ischial spine. X marks the penetration point of the tunneller just medial and behind the ischial spine (IS). SSL=sacrospinous ligament; LP=levator plate; V=vagina; R=rectum; PB=perineal body; B=bladder. The tape and line of SSL have been superimposed on the original xray.

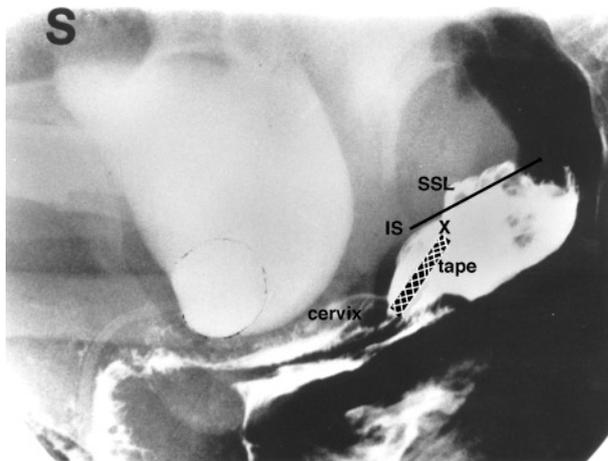


Fig. 2. – Xray of a nulliparous patient, straining. Same patient as figure 1. The tape and line of SSL have been superimposed on the original xray. Note the natural movement of the cervix and vagina activated by the posterior muscle forces. Whereas a tape allows such movements, fixation on SSL is far more rigid, and would inhibit them.

discharge. With my patients, I took bacterial swabs from every tape rejection observed, and rarely was a significant bacterial growth returned. Histology showed macrophages and giant cells, the cardinal diagnostic sign of a foreign body reaction. Partial rejection was dealt with simply by excision of a loop, total rejection simply by pulling on the tape, *as an office procedure*. Such tape rejection, in a small percentage of patients, is a small penalty to pay for vastly reducing morbidity, mortality, urinary retention, and hospital stay.

A foreign body reaction depends on the quantum of foreign material inserted. A large mesh used in conjunction, will greatly increase the foreign body reaction rate. The IVS multifilament tape was used in 1999 because it was the only non-stretch tape available at the time. Even when rejected, it is much easier to remove than a monofilament tape. Unlike the monofilament TVT tape, there is no known report of a urethral fistula.

Used alone, my rejection rate was 1% for the midurethral sling, and 2% for the PIVS. The explanation for the high rates of rejection experienced by Dr Farnsworth may well lie in the combination of PIVS tape with large mesh or biological mesh. Mixed use does not seem so well tolerated.

The PIVS operation was never designed to repair the middle zone of the vagina, which has an entirely different fascial/ligamentous support system. Repair of the posterior zone will inevitably divert the intraabdominal forces to a subclinically damaged middle zone, causing cystocele. This occurred in 16% of patients.<sup>4</sup>

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### Response to the letter from Professor Petros

I thank Professor Petros for his letter to the editor. Whilst the anatomic points made by Professor Petros are correct the reality is that the Posterior IVS does not achieve a true Level 1 apical attachment. In order to provide a true apical attachment the IVS tape would need to pull the apex of the vagina up and back towards the insertion point of the uterosacral ligament over the medial end of the sacrospinous ligament, whereas the Posterior IVS tape passes down from where it attaches to the vaginal apex through the levator plate and into the ischioanal fossa. It secures the vault to the levator muscle below the apex of the vagina. This is acknowledged by Jelovsek et al. when they performed cadaver studies on the anatomy of the Posterior IVS and commented that the “posterior IVS procedure appears to give support to the mid posterior vaginal wall rather than the vaginal apex”.<sup>1</sup> They classified the procedure as a Level 2 support procedure rather than a Level 1 operation.

In order for the IVS tape to truly replicate the uterosacral ligament it would have to pass from one insertion point of the ligament to the other. Umek et al.<sup>2</sup> have shown that in 82% of patients the proximal attachment of the uterosacral ligament overlies the sacrospinous ligament and coccygeus muscle complex. My own clinical experience with posterior compartment reconstruction supports this finding and I have found an advantage in placing an independent apical support at this point.<sup>3</sup> The more posterior and medial the attachment

the better the anatomical restoration. When combined with an independent apical attachment the Posterior IVS is an excellent Level 2 support and is critical in ensuring adequate vaginal length and a normal vaginal orientation as it pulls the posterior fornix of the vagina downwards and backwards into the pit of the sacrum.

Professor Petros describes how creating a rigid attachment between the vagina and sacrospinous ligament reduces functionality. I agree that use of a high density mesh in conjunction with a posterior IVS leads to excessive fibrosis and reduces the cure rate for urinary urgency and other functional symptoms. This finding was reported in an abstract presented to the ICS.<sup>4</sup>

Professor Petros has come to the conclusion that an anatomically lower placed tension free attachment using the posterior IVS is preferable to an immovable tensioned attachment of the vagina to the sacrospinous ligament. However, the technique that I advocate does not rely on such a fixation, rather it is also a tension free Level 1 non absorbable suture attachment using quite a long suture bridge which extends from the proximal, medial end of the sacrospinous ligament to the cervix on each side (Fig. 1). The higher posterior apical attachment is more effective in recreating Level 1 and complements the important role of the Posterior IVS at Level 2 described above (Figs. 2, 3).

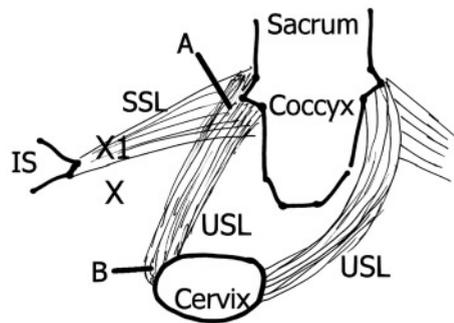


Fig. 1. – The uterosacral ligaments (USL) extend from the coccyx to the cervix. The USL shares a common origin adjacent to the cervix with the sacrospinous ligament (SSL) which extends from the lower sacrum and coccyx to the ischial spine (IS). A suture bridge from position A to position B accurately recreates the USL while a tape from position B to X or X1 does not. The traditional point of attachment of the Posterior IVS to the pelvic side wall is at position X below and medial to IS. Some surgeons advocate attachment of the Posterior IVS to the SSL itself at position X1. Position X1 is also the usual point of attachment when performing a sacrospinous hitch procedure. A more physiological attachment of the vaginal apex can be achieved when the sacrospinous hitch is made to position A.

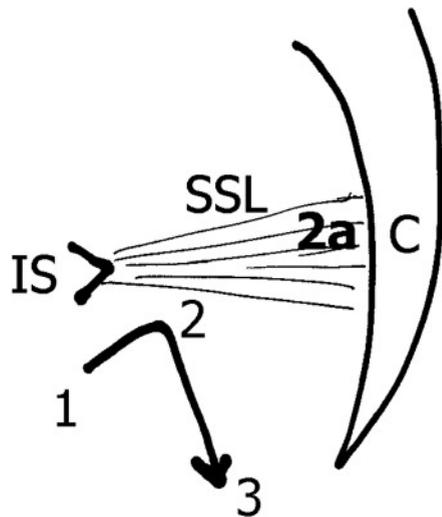


Fig. 2. – Lateral view of the position of a posterior IVS sling which extends from the cervix (position 1) to the point of insertion through the levator muscle (position 2) and then down into the ischioanal fossa (3) to exit the skin of the buttocks. This does not replicate the true attachment of the uterosacral ligaments at position 2a.

Finally, the argument that Professor Petros uses to defend the multifilament tape is unlikely to sway the large number of pelvic surgeons who now only use monofilament tapes and no longer see tape related problems. We need to move forward as the battle to defend the multifilament tape is lost. Surgeons have continued to report mesh erosion, rejection and extrusion with the multifilament IVS tape up to ten years after the original implantation. These problems are not seen with the new monofilament IVS tape.

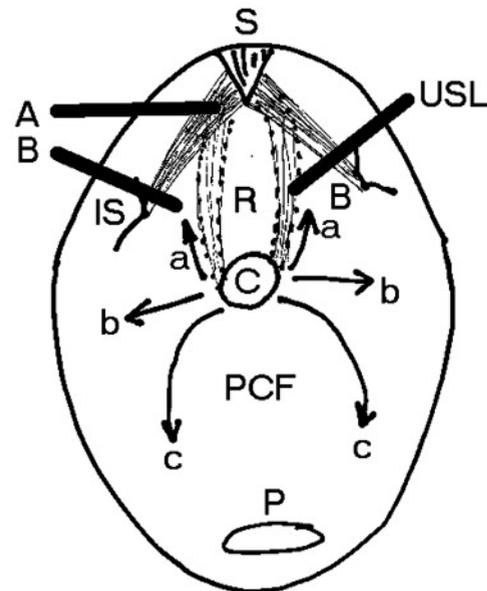


Fig. 3. – Superior (“birds eye”) view of pelvic support ligaments. The Cervix (C) is the key support of the vaginal apex and uterus with ligamentous attachments to the pelvis (a: uterosacral ligaments, b: cardinal ligaments and c: arcus tendineus fascia pelvis). The uterosacral ligaments (USL) help support the rectum (R) which passes between them. The USL and SSL share a common insertion adjacent to the coccyx and lower sacrum at position A which is the best position for apical support. The Posterior IVS is attached to the levator plate at position B.

There is no doubt that the Posterior IVS has proven to be a landmark innovative procedure and Professor Petros has been responsible for a paradigm shift in our understanding of pelvic dysfunction. As the years go by we will all modify our clinical practice in response to our own experiences and the experiences we share with colleagues and each surgeon will individually determine the role of this procedure in his or her future surgical practice.

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