Surgical Window – A New Space at Vaginal Hysterectomy to Minimize Bladder Trauma

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OBJECTIVE – To find out that if vesicouterine adhesions are anticipated in the fold of peritoneum following previous abdominal surgeries, an access to anterior peritoneum through a lateral surgical window provides a safe and free plane of cleavage between urinary bladder and uterocervical surface during vaginal hysterectomy thus avoiding laparoscopic assistance or laparotomy. **METHODS –** One hundred and six patients with a history of cesarean sections and/or myomectony in the past were subjected to vaginal hysterectomy using broad ligament space lateral to the cervix. Operative difficulties, intra-operative complications and surgical time and cost were noted. **RESULTS –** This access avoided anxiety or fear of bladder trauma. Dissection and separation of bladder was assured under vision and reached without difficulty. Vaginal hysterectomy was performed safely in all these women with previous surgery without bladder trauma in any patient. Available laparoscopic assistance was not required at all. **CONCLUSIONS –** With use of this lateral surgical or uterocervical broad ligament space, with anticipated adhesions in vesico-uterine or anterior pouch from previous abdominal surgeries, there should be less anxiety to perform hysterectomy via vaginal route.

Key words : vaginal, hysterectomy, cesarean section

Introduction

Previous cesarean section is often considered a relative contraindication for vaginal hysterectomy because of fear of traumatizing the bladder due to surgical adhesions, particularly, adhesions in uterovesical fold, as access to it may appear technically difficult. This may be true only in few cases associated with dense adhesions in vesicocervical area. However, separation of urinary bladder from the uterocervical surface is not difficult and in fact with growing experience, easy through a MRI proven potential space or surgical window between the lateral uterocervical surface, bladder and the adjoining two leaves of broad ligaments[1]. This obviates the hazards of vesical injury. We firmly believe that the preferred route for hysterectomy is vaginal and minor difficulties, if at all, could be easily circumvented. This is clearly demonstrated in our 106 successive cases of vaginal hysterectomy who had cesarean section in the past. We could get an access to vesicouterine peritoneum through this surgical window without bladder trauma and without laparoscopic assistance.

Materials and Methods

Vaginal hysterectomies were performed between August 1999 and July 2002 in 106 patients with history of one or more previous cesarean section with or without myomectomy in the past. It was presumed that there could be bladder adhesions to uterocervical surface. To minimize risk of trauma to the bladder, the lateral window technique or utilization of uterocervico broad ligament space was used in all cases without performing evaluatory laparoscopy. Approach to vesicouterine peritoneum was through anatomically defined space laterally and described as surgical window. No patient underwent diagnostic laparoscopy to assess presence or absence of adhesions or it's severity, as the findings of the examination under anesthesia, not contraindicating vaginal hysterectomy, were heavily relied on.

All patients were carefully assessed under anesthesia to exclude contraindications to vaginal hysterectomy. Freely mobile uterus and easily accessible cervix were considered important. The operator inspected the anterior vaginal mucosa for normalcy and presence of puckering at the bladder site suggested possible adhesions. Special attention was placed to (a) the mobility of uterus, (b) uterine size, (c) assessment of the uterus free space in the pelvis and (d) adnexal normalcy.

Traction was then applied on the cervix in order to observe the depth of the fornices, the vaginal mucosal landmarks and the degree of uterine descendibility. The operator asked himself that given similar findings, without history of such surgery in the past would he have performed vaginal hysterectomy. If so he should

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be able to circumvent possible anterior adhesions and find access to open vesicouterine peritoneum. Laparoscopic assistance was not considered necessary in any of these cases either before or during vaginal hysterectomy.

Anatomy

The anatomic delineation of the uterocervical broad ligament space is as follows. The anterior wall is formed medially by the undersurface of the lowermost portion of the bladder and laterally by the anterior leaf of the broad ligament. The posterior wall is formed medially by the uterocervical surface as it slopes laterally toward the uterocervical border and laterally by the posterior leaf of the broad ligament. Medially, the space ends where the bladder comes in close contact with the uterocervical surface. Laterally, this space is bounded by a tangential line joining the maximally bulging point on the uterine body and cervix. The uterocervical border with the isthmic notch as its center has two thirds of space medially and one third laterally. Two leaves of the broad ligament are well separated close to the uterocervical border and run closer for some distance before fanning out laterally. Thus, separation of the two leaves close to the uterocervical border is easy.

This space varies with uterine size but, on an average, measures 1.5 to 1 cm or more as it appears encroached and contains loose areolar tissue, lymphatics, and the uterine vessels at the point of entry into the uterine wall. It must be noted that the space does not contain the ureter, which is well away.

Methylene blue, when injected abdominally between the two leaves of the broad ligament just below the medial part of the round ligament, showed the uterocervical space stained dark blue to indicate it's continuity between the two leaves of the broad ligament and part of continuing uterocervical surface. On the other hand, repeated MRI studies around the isthmic level through different planes showed a distinct vacant space medial to the line joining the maximally bulging uterus above and the cervix below, with its continuity medially between the uterocervical surface and the bladder until they come intimately close to each other.

The adhesions between the bladder and the lower uterine segment, particularly after cesarean section could be dense or tough in the midline, usually central three-fifths but never in lateral one-fifth on both sides – the lateral area – the space between the bladder and the leaves of the broad ligament as well as adjoining lateral uterocervical border and surface near the isthmic notch - the uterocervico broad ligament space – was usually free of adhesions. It was therefore possible to enter this space by dissecting near the lateral uterocervical margin by entering through described anatomical structures.

Technique

The anterior vaginal wall incision was made, as usual, a few millimeters below the transverse groove on the vaginal mucosa at the junction of the smooth portio vaginalis and the vaginal rugae, which marks the lower limit of the bladder wall. Traction and countertraction helped defining the tissue planes better (Fig. 1). The space was entered by cutting upwards, under the guessed thickness of bladder on the lateral margin of the cervix (Fig. 2) something similar, to what is done centrally. Finger directed laterally and upwards towards uterocervical surface is introduced through created plane and the plane was enlarged by blunt finger dissection (Fig. 3). Once adequate space was created, it was simple to sweep the finger medially on the uterocervical surface so that the finger was between the bladder anteriorly and the uterocervical area posteriorly and thus to break the midline adhesions bluntly (Fig. 4). A video tape demonstrating the surgical anatomy and technique is available on request from the senior author. In an occasional case with dense adhesions, we had to enter the uterocervical broad ligament space on both sides in order to complete the dissection.

Fig. 1 : Incision on anterior vaginal mucosa showing plane of dissection between bladder and cervix.

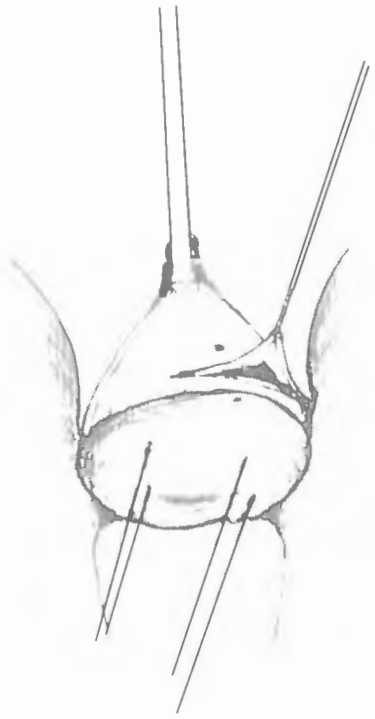

Fig. 2 : Upward traction, with Allis applied laterally, to enter the described space (black area denotes space entry).

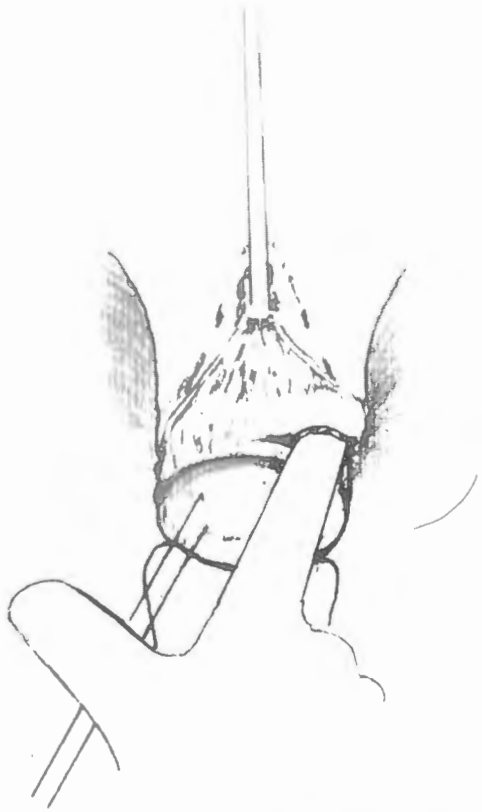

Fig. 3 : Finger directed upwards and laterally to enlarge the plane and break the adhesions, if any.

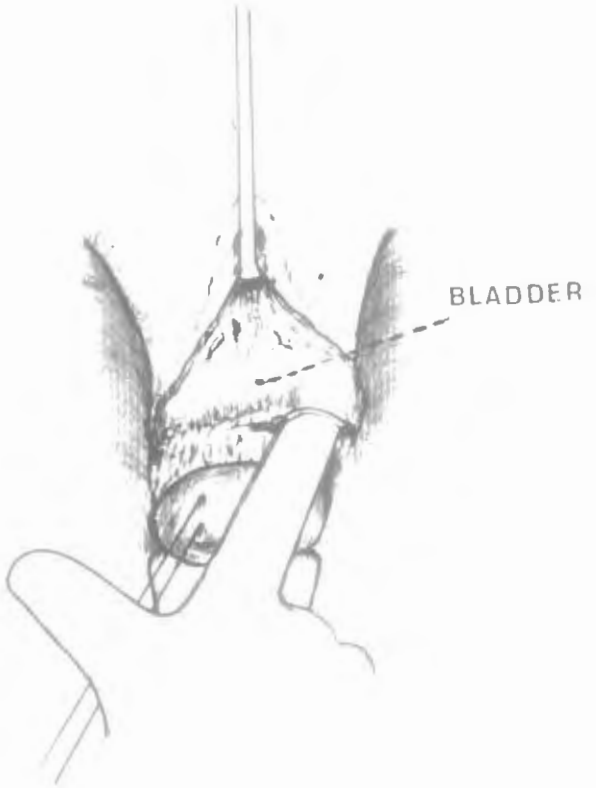

Fig. 4 : Finger pushed further upwards and moved from side to side on uterocervical surface close to the lateral border to enter the uterocervical broad ligament space and thus separate the bladder anteriorly.

While dissecting the bladder upwards off the cervix, tactile sensation was vitally important. In no case was bladder sound used. To hold slightly separated bladder, a Babcock forceps was used and this assisted further separation from lateral to medial area. It was possible to separate the bladder and easily identify anterior uterine surface, often fibrosed or puckered or distinctly undermined below the surface reflecting cesarean section scar site. Tactile sensation and firm, uterocervical tissue confirmed that the bladder is pushed away. In case the structure felt was soft by the palpating finger, then cautious dissection from lateral to medial side was needed to separate the bladder.

If the surface of the anterior uterine wall could be easily palpated through a layer of peritoneum, or peritoneum could be rolled over uterocervical surface or the thin layer of peritoneum had its normal look and/or normal feel, it confirmed that the bladder had been adequately dissected off. Access to and opening of the anterior peritoneal fold was thereafter easy and one could proceed safely with opening the peritoneal uterovesical pouch.

In case the anterior pouch cannot be opened it is

desirable to continue the lateral dissection upwards by progressive ligation and division of the pedicles while care is exercised to keep the bladder away with a bladder retractor. Careful dissection was always under vision. If this did not give clear peritoneum to open, the operator was to deliver the funds from the Pouch of Douglas, and push his finger from behind, to above the fundus and in front between the bladder and the cervico-uterine surface. Very thin layer of peritoneum on probing the finger often needed to be cut to permit the finger's entry and to enlarge the space to keep bladder retractor.

Results

It was possible to perform vaginal hysterectomy safely in 96 patients with previous cesarean section, in six with previous myomectomy and in four with both.

The women were between the ages of 35 and 75 years with a parity of 1-4 (mean 2) except for two nulliparas. Eighty patients had one previous cesarean section, 18 had two previous cesarean sections and two had three previous cesarean sections. All of the previous cesarean sections were with transverse incision on the lower segment.

Opening the vesicouterine fold of peritoneum was easy in 74 cases, whereas 32 required careful dissection aided by very careful palpation and tactile sensation of the uterine surface and of possible bladder wall. In patients with two previous cesarean sections, it was easy to reach the peritoneal fold in eight whereas in 10, extra care and patience was needed. Lateral window technique was used in all as adhesions cannot be ruled out and separation was never attempted from the central site. The space could be reached in all cases. Occasionally small vessels caused bleeding which was easily arrested. In few this also exposed uterine vessel entering the uterus.

Bleeding or oozing from small vessels while approaching this space was more than average in very few and this was easily checked with cautery or occasional suturing. Hysterectomy lasted its usual 20 to 90 minutes including additional time ranging between 5 and 20 minutes depending on the density of adhesions. Thirty two hysterectomies were accompanied by one or more of the following- prophylactic oophorectomy, posterior colporrhaphy and bladder neck suspension. The bladder was intact in all and ureter was damaged in none.

In three cases the abdominal route was almost sealed off because of two previous cesarean sections followed by ventral scar hernia repair with steel mesh. Fourteen more patients had two or three laparotomies in the past for ectopic pregnancy or intestinal, appendicular or gall bladder surgery in addition to one or two cesarean sections. The incidence of postoperative fever and urinary tract infection was not significantly different than usual. There was no bladder, ureter or bowel injury. One patient required a blood transfusion because of 9 gm. hemoglobin to start with. There were no complications of any significance.

Discussion

Hysterectomy is one of the commonest operations in gynecologic practice and anxiety or even fear creeps in, while performing vaginal hysterectomy in women who have had a prior cesarean section or myomectomy and therefore one turns to laparoscopic assistance or abdominal route. Given a large number of cesarean sections carried out today it becomes a vital issue. As with all surgical procedures, there may be complications after hysterectomy, but as a general rule, the incidence is higher by 70% after abdominal hysterectomy when compared with vaginal hysterectomy[2].

Vaginal hysterectomy in patients with adhesions between urinary bladder and uterus, either from previous uterine or pelvic surgery or from past pelvic infection, has been a challenge to the surgeon. Attitude of contraindicating vaginal hysterectomy is still prevalent in some areas[3]. Inadvertent injury to the bladder is most likely during hysterectomy in women with a history of prior cesarean section.

Hoffman and Jaeger[4] mention that a history of multiple cesarean sections has been considered a relative contraindication to vaginal hysterectomy and have even tried a bent uterine sound around the fundus from the posterior cul-de-sac to reach the anterior cul-de-sac and carry out sharp dissection beneath the tip of the sound to open the peritoneal fold. This is a risky proposition and can traumatize the bladder. It is not desirable to use it. Coulam and Pratt[5] believe that the chief concern in such patients has centered around the potential for bladder injury and difficulty in gaining entry into the scarred anterior cul-de-sac.

Kovac et al[6] have discussed the role of laparoscopically assisted vaginal hysterectomy in such patients, but this is more invasive. The intraoperative identification of correct planes and spaces depends on the surgeon's knowledge of anatomy – living anatomy – and especially surgical landmarks as seen in the operative fields. We recommend that during vaginal hysterectomy, after the vaginal mucosa has been incised, if one is anticipating anterior adhesions or experiencing difficulties in their separation, one should as a rule

use the uterocervical broad ligament space – a surgical window . Khung[8] has emphasized the use of Sheth's uterocervical broad ligament space for such a situation. Monaghan (Personal communication, 3rd May 1994) expressed that this concept of uterocervical broad ligament space is an excellent one and is increasingly fascinating as one engages more and more in vaginal surgery. However, we recommend that to acquire this expertise, it is best to practice this access, instead of routine central approach, on women without previous uterine surgery in at least 10 cases.

This surgical window should be used only after some experience of vaginal hysterectomy as a site of uterine vessels showed not be disturbing. The described space, or surgical window, can facilitate promotion of vaginal route for hysterectomy instead of seeking laparoscopic assistance, more so in geographical areas without a laparoscope or a laparoscopist. Hysterectomy performed vaginally without abdominal punctures is less invasive and should be welcome as it provides the patient with many advantages.

If on speculum examination cervix is inaccessible or lies high behind the pubic symphysis with stretched posterior vaginal wall, or half way through hysterectomy the operator fails to define tissue planes anteriorly and pull on the cervix shows retraction or tucking in of abdominal wall due to adhesions between uterocervical surface and lower abdominal wall, one needs to abandon vaginal route and take abdominal route or not so easy laparoscopic assistance[9].

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