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Case Report

A Novel Technique of Laparoscopic Lateral Suspension (LLS) for Apical Prolapse (Faheem Technique)

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Abstract

Keyword:

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Abstract: Laparoscopic Sacro-colpopexy (SCP) using a mesh has been the treatment of choice for pelvic organ prolapse for more than 20 years. However, the potential surgical difficulties associated with the promontory dissection have prompted reflection on surgical alternatives that completely avoid the promontory. Laparoscopic lateral suspension (LLS) is a promising option that gives satisfactory anatomical and functional results. The originality of LLS with MERSILENE tap is the sub-peritoneal tunnel of the lateral long MERSILENE tap through the lateral abdominal wall, leaving the skin above the iliac crest. This suspension prevents potential major risks of injury to the blood vessels, nerves, or bowel, and provides symmetrical lateral tension-free suspension in an anatomical vaginal axis. The indications for LLS are anterior and posterior pelvic organ prolapse and apical descent. LLS can be considered when the access of the promontory is difficult; for instance, in the presence of severe adhesions, sigmoid megacolon, or a low-positioned left common iliac vein that partially covers the promontory. LLS is also a practical alternative technique for surgeons with only moderate experience in dissecting the promontory area. LLS represent a simple, effective and reproducible technique that rarely causes complications.

In this article, the different surgical steps of the procedure are described, providing practical tips for a successful surgery.

Introduction:

Pelvic organ prolapse (POP) is a common pathology that affects up to 30% of women of older than 50 years (1,2). In the 1960s, an alternative approach to vaginal surgery for POP was introduced, Sacro colpopexy SCP, which consisted of a laparotomy and fixation of the pelvic organs (especially the uterus) to the lumbosacral disc (3). However, advances in minimally invasive surgery have made it possible to consider a laparoscopic approach for POP. Laparoscopic SCP with mesh was developed in the late 90s (4). SCP is now the most frequently performed abdominal surgical procedure to treat POP with satisfactory results (5).

However, this technique involves a difficult surgical step comprising the dissection of the promontory area where the mesh will be moored. The dissection and release of the promontory area are sometimes difficult and hemorrhagic, especially in women with obesity, severe pelvic adhesions, megacolon, large varicose veins, and anatomic anomalies such as low bifurcation of the vena cava with coverage of the promontory with the primary left iliac vein or artery.

In addition, a recent study reported that *de novo* back pain occurs in 25% to 50% of patients after laparoscopic SCP with the use of sutures or tackers on the promontory (6).

Finally, there is a risk of spondylodiscitis at the points of fixation of the mesh on the promontory, although this is very rare (7).

The potential difficulties associated with the promontory dissection and the risks of postoperative lumbosacral pain have prompted reflection on laparoscopic surgical alternatives that completely avoid the promontory (8). We therefore devised a new technique in the late 90s, namely laparoscopic lateral suspension (LLS) with mesh or MERSILENE tap (9,10).

We propose in this article to describe the different surgical steps of the technique and to precise the indications.

Case Presentation

A 42-year-old woman was referred to our private clinic for the surgical management of a symptomatic POP. She suffered from bulge symptoms related to a stage 3 apex descent with cystocele according to the POP-Q classification.

We decided perform the LLS technique with MERSILENE tap repair the pelvis.

We decided to preserve the uterus as long as the uterus was healthy, i.e., normal ultra-sound imaging, cervical cytology and endometrial biopsy.

A standard laparoscopy under general anesthesia was performed.

In addition to the umbilical trocar used for the laparoscope, two 5-mm ancillary trocars were needed.

Video 1 Technical tips for performing LLS. LLS, laparoscopic lateral suspension. https://drive.google.com/file/d/1xO4xpwX2U_OL-2bo0W93c2nQrWE_TFFG/view?usp=drive_link

All procedures performed in this study were in accordance with the ethical standards of the hospitals and/or national research committee(s).

Written informed consent was obtained from the patient.

The step was the lateral suspension proper, which constitutes the originality of the “Dubuisson” technique (14). The objective was for the suspension axis to be strictly transverse, so that the preserved uterus remains in the center of the pelvis. The suspension must be exact, without too much tension, to avoid modifying the axis of the vagina. In this step, the arms of the MERSILENE tap were held with traction

forceps, such as 5-mm laparoscopic forceps with claws. The forceps were introduced from the “outside-in” at a precise location on the lateral abdominal wall referred to as “the skin point of the suspension”. This point is a 5-mm skin incision made 2 cm above the iliac crest, approximately 4–5 cm behind the anterior superior iliac spine (ASIS)

Video 2: describe the procedure.
https://drive.google.com/file/d/1b6gV4KPh9a_QQsDokZJ1QH_N5Rog3_xR/view?usp=drive_link

The selected skin point of the suspension should allow the uterus or vaginal vault to return to the middle part of the pelvis. Using this point as the MERSILENE tap exit point avoids «opening» the anterior compartment to limit iatrogenic urinary disorders and reduce the risk of cystocele recurrence, it also prevents opening the posterior compartment, which reduces the risk of enterocele or high rectocele. Starting from the skin point, the route of the forceps from the outside-in was the well-defined “bayonet path”. Under a fairly firm pneumoperitoneum, the forceps were pushed through the skin incision and initially course perpendicular to the abdominal wall, puncturing the fascia and stopping at the peritoneum, without injuring it. For the bayonet path, the forceps were then oriented at a right angle and moved in a horizontal sub-peritoneal direction, parallel to the peritoneum until they reached the ipsilateral round ligament. The forceps then passed below the ipsilateral round ligament to the area of the uterosacral

ligament dissection to grip the extremity of the ipsilateral arm of the MERSILENE tap.

Video 3: The procedure of the operation (2)
https://drive.google.com/file/d/1FQw7rZlWewTXZxGU8LOlFd6SgJxmk_7e/view?usp=drive_link

This end of the MERSILENE tap was gently pulled backwards through the previously formed tunnel and exteriorized to the skin. The arm of the MERSILENE tap must lay flat without any twist.

The same procedure was performed on the contralateral side. The tension of the MERSILENE tap was symmetrically adjusted

The tension was adapted and maintained until the end of the operation. After that by the Maryland grasper pass the MERSILENE tap to other side under the skin then Kocher forceps were used to fix the arm of the MERSILENE tap at the level of the skin on one side, and establish symmetry and adequate tension.

Compliance with hygiene standards was mandatory to avoid any infections related to the presence of the MERSILENE tap

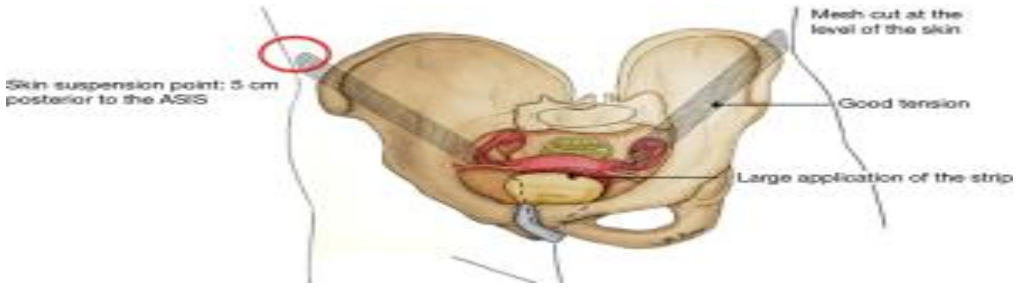

Figure 1: Principles of the correct technique for LLS. LLS, laparoscopic lateral suspension.

Video 4 : the procedure of the operation (3)
https://drive.google.com/file/d/1-Y5zOXmMG0No-6sxpCTvS2GnW3VPHdQ1/view?usp=drive_link

Intra-operative complication:

No major or minor intraoperative complications were encountered.

Tap Suture Material:

MERSILENE* tap, polyester fiber, 5mm, 18” (45cm), double ended, blunt point.

Manufacturer: Ethicon*

Results:

In our case, positioning of the cervix at the level of ischial spine was secured by raising the cervix by assistance of the assistant surgeon.

Immediate recent postoperative period was soft and uncomplicated. A follow up was done 24 hours after the operation, one week and one month. All the functions related to movements of anterior abdominal wall were preserved without any complications or pain, like cough, deep inspiration, bearing down and straining.

Anterior vaginal wall descent, posterior vaginal wall descent and apical uterine displacement were corrected completely.

Follow up:

We do plane for a follow up of this case up to 1 year, to test the technique in terms of urinary complications, pain, degree of recurrence, patient satisfaction and\or presence of any complication.

Recommendation:

We highly recommend to expand this technique to include more cases and to include more difficult cases like big sized uterus and complicated cases by adhesions.

Discussion:

Anterior and posterior organ prolapse considered the main indication for LLS which represents the most common form of POP (14).

The MERSILENE tap must be securely attached to the uterosacral ligament to reconstitute part of the peri cervical ring. The procedure is often performed with posterior anchorage using high suspension to the uterosacral ligaments, so the LLS procedure can be used for isolated apex descent or uterine descent associated with cystocele and rectocele. Vaginal vault prolapse is also a good indication for LLS (15). Cases with vaginal vault prolapse, a cross-shaped MERSILENE tap is used in women The anterior tab provides the anterior sub vesical MERSILENE tap reinforcement, while the central part of the MERSILENE tap is fixed to the vaginal vault, the site of previous total hysterectomy scar, or to the cervix after supracervical hysterectomy. Finally, the posterior tab is applied to the rectovaginal septum, securing the distal end of the tab In women with associated cervical elongation, cervical amputation can be considered in combination with LLS and uterine preservation.

Video 5: Vaginal vault prolapses
https://drive.google.com/file/d/1X6B_dLpXe-Seh6Qp5febQtCHRdc-Xijh/view?usp=drive_link

Some studies shows the rate of complications (Clavien-Dindo grade 3 or higher) was 2.2% at 1-year follow-up (16,17). After LLS, only 7.3% of patients undergo reoperation for POP with a follow-up of at least 4 years (5.3% by vaginal route and

2% by laparoscopy) (16); this problem is observed with all procedures, including SCP. The recurrence rate of POP after laparoscopic SCP is up to 23% (18).

Th anatomical success rate, at the 1-year follow-up, 78.4% of patients were asymptomatic, defined as POP Quantification grading system (POP-Q) points Ba, C and Bp of less than -1cm, were 91.6% for the anterior compartment, 93.6% for the apical compartment, and 85.3% for the posterior compartment.

A large series of women who underwent LLS with mesh showed that the technique is feasible and effective with low postoperative complications at 1 year and a high degree of long-term satisfaction by using a telephone interview for the long-term follow-up (mean 7.2 years) of the 417 patients, 214 participated in. Of the 214 patients interviewed, 187 (87.8%) rated their situation as “improved” or “very much improved”, using the Patient Global Impression of Improvement (PGI-I) questionnaire, and satisfaction was associated with the absence of concomitant hysterectomy. (16).

Several previous studies have reported the short- and long-term results of LLS with mesh to treat POP (9,10,15). The largest series evaluated 417 patients treated between 2003 and 2011 in the University Hospitals of Geneva, Switzerland (16).

Recent studies have been performed LLS in a series of 120 patients also reported excellent results of LLS. After 2 years, 89% of patients were asymptomatic, and the anatomic success rate (defined as POP-Q points Ba, C and Bp of less than −1 cm) was 94.2% for the anterior compartment and 94.9% for the apical compartment. (19).

The risk of vaginal mesh exposure appears to be more limited with the use of polypropylene meshes with large pores and limited weight. The use of polypropylene meshes coated with titanium film limits the occurrence of a foreign body reaction (12).

The LLS with mesh procedure was initially developed to simplify the laparoscopic treatment of POP and avoid the operative complications of SCP, which are uncommon but sometimes severe, particularly at the promontory level. The rare but serious adverse events reported after laparoscopic SCP include injuries to the middle sacral vessels and iliac veins, or varicose veins (21).

A recent controlled study evaluated the vaginal axis on MRI after LLS with marcelin tap (22). After LLS, the angles measured between the pubococcygeal line and the lower vaginal segment and between the levator plate and the pubococcygeal line were similar to the angles found in the nulliparous control women. This finding confirms that the vaginal axis is almost normal after LLS with marcelin tap, and supports the practice of this LLS technique in patients with cystocele and apical prolapse.

Conclusion

it is important to appropriately select women who will benefit from LLS with MERSILENE tap. In women with cystocele and/or descent of the apical compartment or procidentia, the results of LLS with MERSILENE tap are satisfactory and as effective as SCP. The “Dubuisson” technique is simple, effective, and reproducible, with a limited rate of non-severe complications. LLS with MERSILENE tap is a viable option if the surgeon prefers to avoid any dissection of the promontory.

Ethical Statement:

The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research Written informed consent was obtained from the patient.

References:

1. Løwenstein E, Ottesen B, Gimbel H. Incidence and lifetime risk of pelvic organ prolapse surgery in Denmark from 1977 to 2009. Int Urogynecol J 2015;26:49-55. [Crossref] [PubMed]
2. Olsen AL, Smith VJ, Bergstrom JO, et al. Epidemiology of surgically managed pelvic organ prolapse and urinary incontinence. Obstet Gynecol 1997;89:501-6. [Crossref] [PubMed]
3. Huguier J, Scali P. Posterior suspension of the genital axis on the lumbosacral disk in the treatment of uterine prolapse. Presse Med 1958;66:781-4. [PubMed]
4. Wattiez A, Maschiach R, Donoso R. Laparoscopic repair of vaginal vault prolapse. Curr Opin Obstet Gynecol 2003;15:315-9. [Crossref] [PubMed]
5. Rivoire C, Botchorishvili R, Canis M, et al. Complete laparoscopic treatment of genital prolapse with meshes including vaginal promontofixation and anterior repair: a series of 138 patients. J Minim Invasive Gynecol 2007;14:712-8. [Crossref] [PubMed]
6. Vieillefosse S, Thubert T, Dache A, et al. Satisfaction, quality of life and lumbar pain following laparoscopic sacrocolpopexy: suture vs. tackers. Eur J Obstet Gynecol Reprod Biol 2015;187:51-6. [Crossref] [PubMed]
7. Brito LG, Giraudet G, Lucot JP, et al. Spondylodiscitis after sacrocolpopexy. Eur J Obstet Gynecol Reprod Biol 2015;187:72. [Crossref] [PubMed]
8. Cornier E, Madelenat P. The M. Kapandji hysteropexy; a laparoscopic technique and preliminary results. J Gynecol Obstet Biol Reprod (Paris) 1994;23:378-85. [PubMed]
9. Dubuisson JB, Jacob S, Chapron C, et al. Laparoscopic treatment of genital prolapse: lateral utero-vaginal suspension with 2 meshes. Results of a series of 47 patients. Gynecol Obstet Fertil 2002;30:114-20. [Crossref] [PubMed]
10. Dubuisson JB, Yaron M, Wenger JM, et al. Treatment of genital prolapse by laparoscopic lateral suspension using mesh: a series of 73 patients. J Minim Invasive Gynecol 2008;15:49-55. [Crossref] [PubMed]

11. Dubuisson J, Veit-Rubin N, Bouquet de Jolinière J, et al. Laparoscopic lateral suspension: Benefits of a cross-shaped mesh to treat difficult vaginal vault prolapse. J Minim Invasive Gynecol 2016;23:672. [Crossref] [PubMed]
12. Hazebroek EJ, Ng A, Yong DH, et al. Evaluation of lightweight titanium-coated polypropylene mesh (TiMesh) for laparoscopic repair of large hiatal hernias. Surg Endosc 2008;22:2428-32. [Crossref] [PubMed]
13. Powell BS, Voeller GR. Current developments in hernia repair; adhesives, and tacking. Surg Technol Int 2010;20:175-81. [PubMed]
14. Dubuisson JB, Eperon I, Jacob S, et al. Laparoscopic repair of pelvic organ prolapse by lateral suspension with mesh: a continuous series of 218 patients. Gynecol Obstet Fertil 2011;39:127-31. [Crossref] [PubMed]
15. Dubuisson J, Eperon I, Dällenbach P, et al. Laparoscopic repair of vaginal vault prolapse by lateral suspension with mesh. Arch Gynecol Obstet 2013;287:307-12. [Crossref] [PubMed]
16. Veit-Rubin N, Dubuisson JB, Gayet-Ageron A, et al. Patient satisfaction after laparoscopic lateral suspension with mesh for pelvic organ prolapse: outcome report of a continuous series of 417 patients. Int Urogynecol J 2017;28:1685-93. [Crossref] [PubMed]
17. Clavien PA, Barkun J, de Oliveira ML. The Clavien-Dindo classification of surgical complications: five-year experience. Ann Surg 2009;250:187-96. [Crossref] [PubMed]
18. Maher CF, Feiner B, DeCuyper EM, et al. Laparoscopic sacral colpopexy versus total vaginal mesh for vaginal vault prolapse: a randomized trial. Am J Obstet Gynecol 2011;204:360.e1-7. [Crossref] [PubMed]
19. Mereu L, Tateo S, D'allerio MN, et al. Laparoscopic lateral suspension with mesh for apical and anterior pelvic organ prolapse: A prospective double center study. Eur J Obstet Gynecol Reprod Biol 2020;244:16-20. [Crossref] [PubMed]
20. Yassa M, Tug N. Uterus-preserving laparoscopic lateral suspension with mesh operation in pelvic organ prolapse: Initial experience in a single tertiary center with a median 24-months follow-up. Geburtshilfe Frauenheilkd 2019;79:983-92. [Crossref] [PubMed]

21. Coolen AW, Bui BN, Dietz V, et al. The treatment of post-hysterectomy vaginal vault prolapse: a systematic review and meta-analysis. Int Urogynecol J 2017;28:1767-83. [Crossref] [PubMed]

22. Pulatoğlu Ç, Yassa M, Turan G, et al. Vaginal axis on MRI after laparoscopic lateral mesh suspension surgery: a controlled study. Int Urogynecol J 2021;32:851-8. [Crossref] [PubMed]

23. Veit-Rubin N, Dubuisson J, Constantin F, Lange S, Eperon I, Gomel V, Dubuisson JB. Uterus preservation is superior to hysterectomy when performing laparoscopic lateral suspension with mesh. Int Urogynecol J 2019;30:557-564. [Crossref] [PubMed]

24. Milani R, Manodoro S, Passoni P, et al. Surgical management of bladder erosion and pelvic pain after laparoscopic lateral suspension for pelvic organ prolapse. Int Urogynecol J 2020;31:843-5. [Crossref] [PubMed]5:11.