DOI: 10.1111/j.1471-0528.2005.00845.x
www.blackwellpublishing.com/bjog

Short communication

Laparoscopic vaginoplasty: alternative techniques in vaginal reconstruction

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Accepted 18 November 2005.

Construction of a neovagina is the next step for women with an absent vagina who have failed vaginal dilator therapy. Traditional operative techniques such as skin grafting or intestinal substitution have major disadvantages including prolonged recovery time and significant scarring. Laparoscopic vaginoplasty is performed widely throughout Europe but has not been available in the UK until now. We report on five women who underwent laparoscopic vaginoplasty. Three women underwent a laparoscopic Vecchietti procedure and two underwent a laparoscopic Davydov procedure. Details were recorded on preoperative features, perioperative problems and early postoperative outcome. Laparoscopic vaginoplasty is a safe treatment for vaginal agenesis, and short-term results are encouraging.

Keywords Davydov, laproscopic, vaginoplasty, vecchietti.

Please cite this paper as: Ismail I, Cutner A, Creighton S. Laparoscopic vaginoplasty: alternative techniques in vaginal reconstruction. BJOG 2006; 113:340–343.

Introduction

Vaginal reconstruction is necessary in conditions where the vagina is short or absent. This occurs in conditions such as Rokitansky syndrome and complete or partial androgen insensitivity syndrome. Nonsurgical techniques such as self-dilation with vaginal dilators have been shown to have a good success rate combined with minimal risk and should be offered as first-line treatment.[1] However, for some women, vaginal dilation may not be suitable. This may be due to previous multiple vaginal operations leading to significant scarring and inability of the vaginal tissue to adequately stretch by dilation alone. In addition, some women fail addition due to psychological difficulties despite support. For these women, surgical reconstruction of a neovagina is the next step. In the past, the two most frequently performed procedures were lining of the neovaginal space with a split thickness skin graft (the McIndoe-Reed procedure) and lining of the neovaginal space with a section of intestine. Both are major procedures with significant risks and complications. Women following the McIndoe-Reed skin graft commonly have vaginal stenosis and are troubled with unsightly scars at the harvest site. Intestinal vaginoplasty is not only a major operation, but it can lead to excessive foul-smelling vaginal discharge and diversion colitis. An increased risk of malignant change in these grafts has also been reported.

The Vecchietti[2] and Davydov[3] techniques for vaginal reconstruction have been widely practiced throughout Europe. They were initially devised as open-operative procedures, but advances in minimal access techniques allow both procedures to be performed laparoscopically. Initial reports in European studies have demonstrated low complication rates, and early reports on sexual function are encouraging.[4,5] These procedures have been slow to take off in the UK, and we are the first group to report a series of laparoscopic vaginoplasties performed in the UK.

Methods

We report the outcome of five women, all of whom attended the multidisciplinary Middlesex Centre Clinic in the Elizabeth Garrett Anderson Hospital. This is a tertiary referral centre for congenital anomalies of the vagina. Three women had Rokitansky syndrome and had not undergone previous reconstructive vaginal surgery. Two other were XY females, and both had undergone previous feminising genitoplasty in childhood. The mean age was 25 years (range 15–49 years). All the five women were initially prescribed self-vaginal dilation treatment supervised by the clinical nurse specialist, with regular support from a clinical psychologist. Unfortunately, none of the five women was able to achieve an increase in adequate vaginal length and so surgery was offered. The three

women with Rokitansky syndrome and with no previous vaginal surgery were offered a Vecchietti procedure, while the two XY women with previous genital surgery were offered a laparoscopic Davydov procedure.

Prior to surgery, all women had bowel preparation with Picolax and received prophylactic antibiotics and low-molecular-weight heparin. All operations were performed under general anaesthesia by the two senior authors. Patients were placed in supine-lithotomy positions for easy simultaneous access of the abdomen and perineum.

Laparoscopic Vecchietti technique

The principle of the Vecchietti technique is to create a neovagina by gradual stretching of the patient's own vaginal skin. This involves placing an olive-like bead onto the vaginal dimple, which is pulled up gradually by threads that run through the olive from the perineum into the pelvis and out through the abdomen where they are attached to the traction device (Storz; Karl-Storz-Endoskope, Tuttlingen, Germany) (Figure 1).

The bladder was catheterised, and a pneumoperitoneum was achieved via a transumbilical approach. A 10-mm laparoscope was introduced through a subumbilical 10-mm trocar. Two 5-mm trocars were then inserted under direct vision lateral to the rectus sheath in line with the umbilicus. A probe was inserted into the rectum to outline it. The vesicorectal space was then dissected and the bladder reflected anteriorly. Under direct vision, a straight thread guide needle (Storz as above) bearing two nylon threads (O ethilon; Ethicon, Somerville, NJ, USA) was inserted from each lateral aspect of the vaginal dimple. The thread was then held in the pelvis by a laparoscopic grasper, and the needle was slowly removed. From the abdominal side, a curved thread guide needle was inserted through the mark made initially on the suprapubic skin on the same side as the insertion of the first thread guide needle under direct vision. The threads from the laparoscopic grasper were then threaded into the curved thread guide needle and the needle slowly brought back through the abdominal wall. The olive bead was threaded on the perineal side to sit on the vaginal dimple externally, while the other end of the thread was inserted again into another Vecchietti straight needle and the process repeated on the other side of perineum. The peritoneum was then closed with an absorbable suture and a cystoscopy performed to ensure that the bladder had not been perforated. The threads once in position were pulled gently prior to attaching to the traction device that sits on the abdomen. The threads were then gradually and gently tightened approximately 1 cm/day for 7 days.

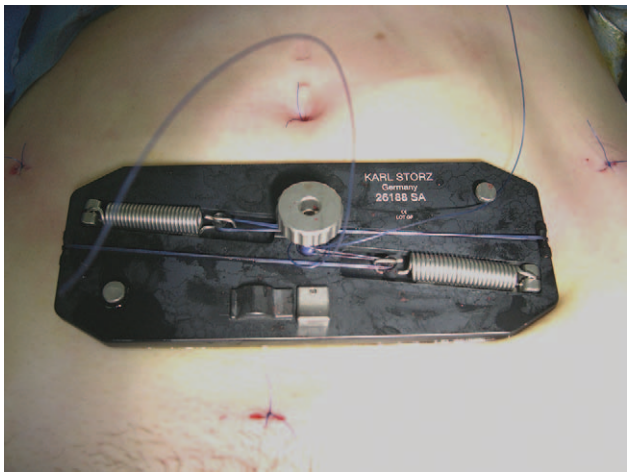

Figure 1. Vecchietti traction device in place on the abdomen with traction threads in position.

Adequate analgesia was maintained by patient control analgesia device for the first 3 days and simple oral analgesia thereafter. On the seventh day, the Vecchietti device and Foley catheter were removed and the woman was advised to use vaginal dilators for 30 minutes daily to maintain vaginal length until sexually active.

Laparoscopic Davydov technique

The principle of the Davydov technique is to create a neovagina using the patient's own peritoneum as the lining.

In this procedure, the bladder was catheterised and a pneumoperitoneum and laparoscopic entry were achieved as previously mentioned. An additional suprapubic 11-mm trocar was placed to enable surgical assistance and the passage of needles into the abdominal cavity. A U-shaped perineal incision was made to create a flap and a neovaginal space created by blunt dissection vaginally and by opening the rectovesical space laparoscopically. A rectal probe was used to help identify the correct dissection plane. In the pelvis, lateral releasing incisions were performed to free the peritoneum so that it could be directed down towards the vaginal incision. The peritoneum was then sutured to the vaginal edges. The top of the vagina was created by suturing a vaginal 'roof' of large bowel serosa. A soft vaginal mould (Silicone-gel-filled vaginal spacer; Polytech Silimed, Eurosurgical, Guildford, UK) was then inserted. The Foley catheter and vaginal mould remained *in situ* for 1 week and were then removed. Patients were then encouraged to practice mould insertion and removal and advised to keep the mould *in situ* at all times for 6 weeks and then to commence vaginal dilators for 30 minutes daily to maintain vaginal length until sexually active.

Following discharge from the hospital, all women were reviewed at 2 weeks, 3 months and 6 months initially. Yearly follow up was arranged thereafter.

Results

All procedures were performed laparoscopically under general anaesthetic, and no intraoperative complications was encountered. The average preoperative vaginal length was

2.2 cm (range from 0 to 4 cm). The average vaginal length at 7 days following vaginoplasty was 7.6 cm (range 6.5–8.5 cm). There was no significant difference in the vaginal length achieved between the two techniques. The mean length for follow up for all women was 10.6 months (range 6–30 months), and the mean vaginal length at 6 months was 6.2 cm (range 5–8 cm). Of the three women following the Vecchietti procedure, two are sexually active without difficulty and one has maintained her vaginal length and width with regular dilation. One woman following the Vecchietti procedure complained of worsening of her existing stress incontinence. Urodynamic stress incontinence was confirmed by urodynamic studies, and she underwent a laparoscopic colposuspension without complication.

Of the two women following the Davydov procedure, neither is sexually active. One has maintained her vaginal length and width with regular dilation. Unfortunately, one woman following the Davydov failed to comply with vaginal dilator therapy, and although the vagina retained a 5-cm length, it became stenosed and narrowed, only admitting a cotton bud.

The total average length of hospital stay was 9 days, but those who had undergone the Vecchietti procedure had a shorter stay in hospital (7–9 days) compared with those who had undergone Davydov procedure (9 and 12 days).

Discussion

It has been recognised for some time that there is a huge gap between the current options for vaginal reconstruction namely vaginal dilation and neovagina construction with intestine or skin grafting. Laparoscopic vaginoplasty is a new approach in the UK and seems likely to fill this gap. This series demonstrates that these procedures can be performed safely and that short-term results appear satisfactory. Laparoscopic techniques are cosmetically much more acceptable to adolescents and young women when compared with scarring from laparotomy or skin graft donor sites.

It is important to select the laparoscopic procedure appropriately. The Vecchietti procedure is only suitable for those women who have not had previous vaginal surgery. It involves stretching the vagina in a way very similar to vaginal dilation. The vagina is, however, lengthened over a much shorter period of time than with dilators and with no motivation required from the patient during the initial lengthening. Subsequent dilation is likely to be easier as it is required to maintain vaginal length rather than creating vaginal length. Sexual intercourse is also an excellent method of maintaining the length achieved by the Vecchietti.

The Davydov procedure is more suitable for those who have undergone previous unsuccessful vaginal surgery. It involves more extensive dissection, and residual scar tissue can be divided. The side walls of the vagina are lined with pelvic peritoneum, and no vaginal stretching is required.

One advantage of minimal access surgery is usually a reduced length of hospital admission. The length of stay in hospital for these patients was long, with a mean of 9 days. As these procedures require close postoperative monitoring, with the traction device for the Vecchietti and the dilators for the Davydov, it is unlikely that hospital stay will be reduced. However, it is likely that recovery once home is easier than following laparotomy, although this requires further evaluation.

One woman developed worsening stress incontinence after the Vecchietti and required a subsequent laparoscopic colposuspension, which was successful. Lower urinary tract symptoms have not been reported in the European literature as a risk of these procedures. However, there has been some suggestion that mullerian anomalies may be associated with lower urinary tract symptoms aside from the already well-recognised association with renal anomalies.[6] The absence of reported incontinence may be due to a failure to ask about urinary symptoms before and after vaginoplasty. It is certainly possible that the bladder neck position and function may be altered by lengthening the vagina, and this aspect needs further evaluation.

One woman had a disappointing result after the Davydov procedure. Although the vaginal length 1 week after the procedure was excellent, she found vaginal dilation impossible to maintain. Despite many hours of psychological input and support, she gave up dilating and the vagina subsequently quickly stenosed. Patient should be carefully selected for surgery and should understand the importance of postoperative vaginal dilation.

Both the procedures should be performed by surgeons with experience in vaginal reconstruction and laparoscopic surgery, with support from a clinical nurse specialists and psychologist to obtain optimal postoperative outcome. A multidisciplinary approach in all aspects of care cannot be overemphasised.

Conclusion

A laparoscopic approach to vaginal reconstruction is safe and effective in situations where vaginal dilation has failed. It offers reduced morbidity compared with the classical available procedures. Postoperative vaginal dilation is essential to prevent vaginal stenosis. Short-term results for both techniques are encouraging, but further studies are needed to assess long-term functional outcome. ■

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