A New Technique of Laparoscopic Ovarian Suspension with Microsuture for Adhesion Prevention in Patients Undergoing Fertility Enhancing Surgery

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Abstract: A new laparoscopic technique of ovarian suspension with microsuture that physically separates the ovary from the ovarian fossa to reduce the incidence of post-operative adhesions is described. Four women with adhesions of the ovary to the ovarian fossa and infertility underwent laparoscopic surgery with ovarian suspension. A 6-0 weight polypropylene swaged to a tapered straight needle was passed laterally to medially through the ipsilateral round ligament, through the mesosalpinx and then through the medial aspect of the ovarian insertion of the utero-ovarian ligament. The needle was then passed back through the mesosalpinx and round ligament and tied. The technique, technical feasibility, ease of procedure and post-operative complication rate is detailed. This technique separates the ovarian surface from the peritoneum of the ovarian fossa yet maintains the normal adnexal anatomy.

Keywords: Laparoscopy, adhesions, ovarian suspension, infertility.

INTRODUCTION

Insult to opposing epithelial surfaces by endometriosis, infection or surgical trauma may lead to adhesion formation. Adhesions of the abdomen or pelvis may cause intestinal obstruction, chronic pain, difficult subsequent surgery, and infertility [1]. Adhesions may adversely affect fertility by distortion of tubal anatomy and thereby interference with gamete and embryo transport and by alteration of the fimbrio-ovarian relation so as to prevent retrieval of the cumulus oophorus.

There has been recent interest in laparoscopic ovarian suspension, especially with surgical therapy for scarring caused by endometriosis between ovary and pelvic sidewall [2]. Reformation of these adhesions may involve the ureter. We report our technique in that it addresses these issues.

After laparoscopic lysis of pelvic adhesions, the rate of recurrence at second-look laparoscopy is as high as 97.1% [3-5]. Adhesions involving the ovary are significantly more likely to recur if endometriosis is present [6-8]. Techniques of ovarian suspension previously reported do not utilize microsuture. The use of coarse suture may cause adhesions. We have reported previously the use of a 3 mm diameter knot pusher that facilitates the use of light weight (6-0, 7-0 suture) and thus allows the principles of microsurgery to be applied at laparoscopy [9]. We have also confirmed that this weight of microsuture does not provoke adhesion formation at laparoscopy [10].

The aim of this study was to describe a unique approach to ovarian suspension with microsuture that maintains the normal fimbrio-ovarian relation.

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MATERIALS & METHODS

From 2004 to 2006, four women (mean age 35) underwent a laparoscopy as part of the investigation of infertility. One woman had previous laparoscopic pelvic surgery for removal of an endometrioma. All women had dense adhesions of one ovary to the ipsilateral ovarian fossa. The adhesions were related to endometriosis in three women and previous salpingitis in one woman. All procedures were performed by a single surgeon (PMcC).

Three-port laparoscopy was performed in a standardized fashion under general anesthesia. All ports were 5 mm: one port was located at the umbilicus, a second port is located 4 cm suprapubically in the midline and the remaining port was located 6 cm lateral to the midline over the adnexa of interest. The procedure included inspection of pelvic and peritoneal organs and sharp lysis of adhesions from the ovary to the adjacent ovarian fossa.

The ovarian suspension was performed with the use of a 6-0 weight polypropylene swaged to a tapered straight needle (Ethicon Sutures Ltd., Canada). The needle was introduced through a 5mm port over the adnexa using a 3 mm needle-holder. The needle was passed laterally to medially through the ipsilateral round ligament (Fig. **1**), through the mesosalpinx (Fig. **2**) and then through the medial aspect of the ovarian insertion of the utero-ovarian ligament (Fig. **3**).

The needle was then passed back through the mesosalpinx and round ligament where it was tied, extracorporeally with tension sufficient to rotate the ovary away from the ovarian fossa but to still retain the normal fimbrio-ovarian relation when viewed under low intraperitoneal pressure, approximately 5 mmHg.

In devising this technique, we were concerned that passage of the needle through mesosalpinx may traumatize a blood vessel. This has not arisen. The cornual tributary of the ascending branch of the uterine artery lies immediately

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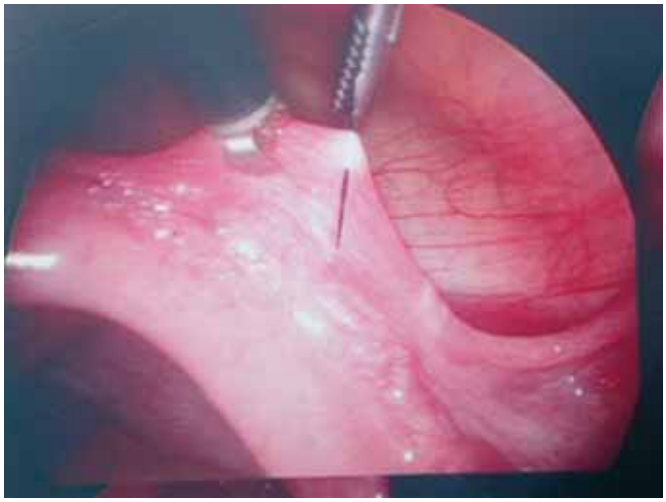

Fig. (1). The needle is passed laterally to medially through the ipsilateral round ligament.

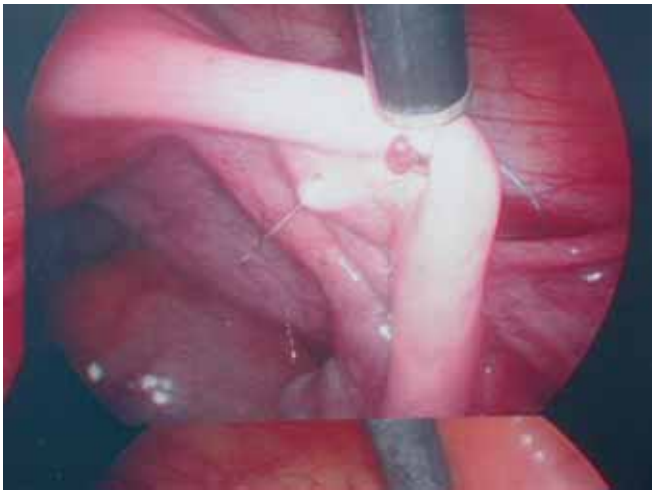

Fig. (2). The needle is passed through the mesosalpinx several millimeters beneath the oviductal isthmus.

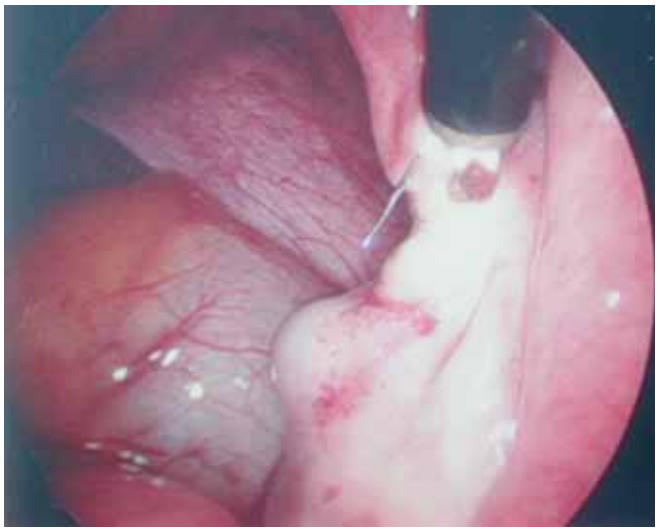

Fig. (3). The needle is passed through the upper medial aspect of the utero-ovarian ligament.

beneath and parallel to the isthmus of the oviduct. We therefore pierce the mesosalpinx several millmetres beneath the oviduct. The use of microsuture also reduces risk of vascular disruption.

It is also important to note the placement of the suture in the medial and upper aspect of the ovarian insertion of the utero-ovarian ligament. This induces rotation of the ovary, rather than simple elevation. Elevation alone may be insufficient to separate the ovarian and peritoneal surfaces.

RESULTS

There were no complications; all patients required routine post-laparoscopy analgesics and all patients were discharged on the same day.

DISCUSSION

Various surgical techniques to reduce the incidence of pelvic adhesion formation or recurrence have been described. Temporary laparoscopic ovarian suspension to the anterior abdominal wall has been reported prevent adhesion recurrence [11,12]. This technique passes a loop of suture from the anterior abdominal wall, through the ovary, medially, and back through to the anterior abdominal wall where is it secured for 4 to 7 days. This technique is limited as the fimbrio-ovarian relation is unknown post-operatively, the loop of suture may cause herniation of abdominal viscera, and the exteriorized suture may be a portal for infection.

Permanent laparoscopic ovarian suspension to reduce the incidence of post-operative adhesions was first reported in 2001 [13]. This technique passed a friction stay suture through the ipsilateral round ligament, through the lateral then medial ovarian pole and back through the round ligament and tied. A second laparoscopy was performed on 3 women and no adhesions of the ovary to the ovarian fossa were identified. While this technique is similar to ours, it involves passing a needle twice through ovarian tissue and follow-up is available on only 3 patients. The technique plicates the ovary and does not rotate the ovary away from peritoneum.

In each of the reported techniques coarse suture is used; this may well induce the very adhesion formation that the suspension is intended to prevent. Nevertheless, it is appreciated that the severity of the endometriosis may be beyond the scope of microsuture.

Our study is limited by a small sample size. However, we have not encountered, nor anticipate, any mitigating circumstances in the application of this novel technique.

In conclusion, laparoscopic ovarian suspension with microsuture through the mesosalpinx is simple and safe and consistent with future fertility. Further application of this procedure and long-term follow-up of women is warranted to further evaluate this novel technique.

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