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CASE REPORT

Robotic surgery in the management of benign complex adnexal masses with a frozen pelvis in women desiring to preserve fertility

Rubin Raju [a,*], Mohamed Satti [a], Oluwamuyiwa Bolonduro [a], Mohamed Ashraf [b,c], Mostafa I. Abuzeid [b,c]

[a] *Department of Obstetrics and Gynecology, Hurley Medical Center, Michigan State University, College of Human Medicine, Flint Campus, Flint, MI, USA*
[b] *Division of Reproductive Endocrinology and Infertility, Department of Obstetrics and Gynecology, Hurley Medical Center, Michigan State University, College of Human Medicine, Flint Campus, Flint, MI, USA*
[c] *IVF Michigan, Rochester Hills, MI, USA*

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KEYWORDS

Pelvic adhesive disease;
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Abstract *Background:* A "frozen pelvis" is a term often used to describe extensive pelvic adhesions. It is considered as one of the most challenging situations that a gynecologic surgeon can face. It commonly is caused by extensive endometriosis and pelvic inflammatory disease. We present two cases with extensive pelvic adhesive disease with the aim to illustrate the value of robotic assisted laparoscopy in the management of benign complex adnexal masses with severe pelvic adhesive disease in women desiring to preserve the fertility. *Case 1:* A 27 year old female referred to our clinic for evaluation of a complex left adnexal mass. Trans-vaginal ultrasound scan and an MRI suggested bilateral endometriomas. She was noted to have stage IV endometriosis. Da Vinci robot assisted left salpingo-oophorectomy was performed. *Case 2:* A 43 year old female presented with recurrent episodes of pelvic inflammatory disease following an unsuccessful in vitro fertilization procedure. A trans-vaginal ultrasound scan showed a complex left adnexal mass. She was noted to have extensive pelvic adhesions secondary to chronic pelvic inflammatory disease. Da Vinci robotic assisted left salpingectomy was performed, while preserving the left ovary. *Conclusion:* Our experience and review of literature suggest that in hands of an experienced surgeon, the inherent advantages of robotic assisted operative laparoscopy makes it a safe and attractive alternative to conventional operative laparoscopy and laparotomy

* Corresponding author at: 2045 Fox Hill Drive Apt 1, Grand Blanc, MI 48439, USA (home) and One Hurley Plaza, Suite 101, Flint, MI, 48503, USA (work). Tel.: +1 (810) 919 8580.
E-mail address: rraju1@hurleymc.com (R. Raju).

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for managing benign complex adnexal masses with concomitant severe pelvic adhesive disease in women desiring to preserve their fertility.

1. Introduction

A "frozen pelvis" is a term often used to describe extensive pelvic adhesions. It is considered as one of the most challenging situations faced by a gynecologic surgeon (1). The reproductive organs and adjacent structures are distorted by extensive fibrosis, which obscure the normal anatomic landmarks and surgical planes, making dissection extremely difficult and increasing the risk of damage to vital organs. The five major causes of extensive pelvic adhesive disease are infection, surgery, benign growths (myomata, endometriosis, adenomyosis), malignant growths and radiation therapy (1). The most important clinical consequence of adhesions is/are chronic pelvic/abdominal pain, infertility and bowel obstruction (2).

The etiology behind adhesion formation involves various factors leading to defective fibrinolysis following a repair response triggered subsequent to injury (3). It is known that damage to peritoneal surfaces induces an inflammatory response involving white blood cells, macrophages, cytokines, mesothelial cells and tissue and coagulation factors. This results in fibrin deposition at the site of injury. Incomplete fibrinolysis and resorption of the deposited fibrin and its degradation products results in connective tissue scars and adhesions formation (3). Fibrinolysis is often impaired secondary to thermal injury, desiccation, ischemia, foreign bodies, blood, bacteria, and some drugs. Genetic polymorphisms may also play a role in the host's inflammatory and healing response (3).

Compared to laparotomy, minimal invasive surgery has shorter operative time, smaller scars, faster recovery, decreased adhesion formation, decreased hospital stay and decreased morbidity (4). The American College of Obstetrics and Gynecology (ACOG) recognizes that the laparoscopic approach to the management of benign adnexal masses is desirable and appropriate (5). The AAGL position statement on robotic assisted laparoscopy in benign gynecology (2013) noted that robotic assisted laparoscopy had comparable outcomes when compared to conventional laparoscopy (6). We believe that robotic assisted laparoscopy is more advantageous for large complex adnexal masses in the presence of dense adhesions in women desiring to preserve fertility.

We present two cases of benign complex adnexal masses complicated by severe pelvic adhesive disease managed with robotic assisted laparoscopy in women desiring to retain fertility in support of our argument.

2. Case description

2.1. Case 1

A 27 year old female was referred to our infertility clinic for evaluation of a complex left adnexal mass. She had complained of menorrhagia and dysmenorrhea for the past few months. Trans-vaginal ultrasound scan and an MRI were suggestive of bilateral endometriomas. The left adnexal complex cystic mass measured $9.9 \times 3.5 \times 4.6$ cm and the right adnexal mass measured $6.8 \times 5.1 \times 6$ cm in dimensions. CA 125 levels were markedly elevated (252 U/ml). We proceeded with Da Vinci robot assisted laparoscopy with possible left salpingo-oophorectomy, right salpingo-ovariolysis and lysis of pelvic adhesions. A generalized view of the pelvic cavity showed a large hydrosalpinx in the left adnexa plastered to the lateral pelvic wall, sigmoid colon and uterus (Fig. 1). The cul-de-sac was also obliterated due to the extensive adhesions. We started with carefully dissecting the adnexal mass off the sigmoid colon and the lateral pelvic side wall. The ureter, external and internal iliac vessels were identified (Fig. 2). A biopsy was obtained from the left hydrosalpinx and sent for frozen section which confirmed its benign nature. The left adnexal mass was then completely excised. The right ovary was firmly adhered to the sigmoid colon. Right salpingo-ovariolysis was performed. Hemostasis was secured using bipolar cautery and Floseal (Baxter Healthcare Corporation, Deerfield, IL, USA) was applied (Fig. 3). The patient tolerated the procedure well and was discharged home after 23 h observation in the hospital. The patient had an uneventful recovery. She subsequently underwent IVF-ET, conceived after the second attempt and is currently at 24 week gestation.

2.2. Case 2

A 43 year old female with secondary infertility and a known history of endometriosis underwent an IVF-ET cycle at another facility. The patient presented with acute onset pelvic inflammatory disease 8 days after oocyte retrieval. She was treated with oral antibiotics without much improvement and subsequently admitted to the hospital for intravenous antibiotics, to which she responded. For the following six months she continued to have recurrent flare ups of pelvic inflammatory disease, requiring multiple visits and treatment with

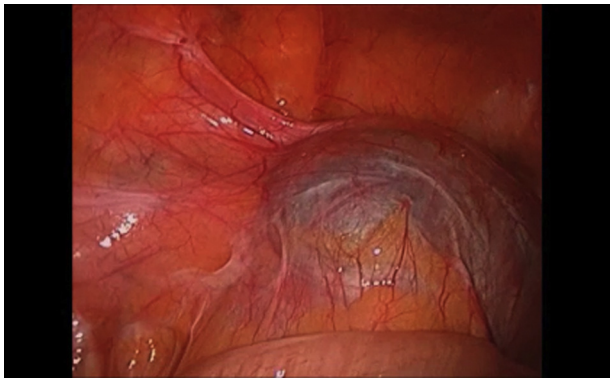

Figure 1 Case 1 – A large hydrosalpinx in the left adnexa plastered to the lateral pelvic wall sigmoid colon and uterus.