

and number of eggs retrieved (7), the length and cost of treatment in the former are significantly higher.

If the ovarian stroma is involved in the sclerotic process, then follicular development and ovulation induction will be adversely affected. This makes it easier to explain why the long protocol did not have any advantage over the short one in this case. The inhibitory effect of GnRH-a on ovarian receptors can make COH rather lengthy and inconvenient. Therefore, their use in such cases should be questioned and possibly withheld.

There have been case reports (8) in which GnRH-a were used for down-regulation and inhibition of ovarian activity in an attempt to prevent premature ovarian failure when chemotherapy was to be administered. Chemotherapy is known to affect fast-dividing cells such as the granulosa and theca cells in the developing follicle. If the ovaries enter an inactive phase, some of their function might be preserved, but this would be very difficult to establish unless controlled studies are carried out. Until then, it would be sensible to recruit patients who will need treatment with chemotherapy and induce a state of ovarian inactivity using GnRH-a. As premature ovarian failure could be the end result of certain cytotoxic therapy, the logic behind this approach is strong, but the outcome is doubtful and people may argue about its usefulness. In the meantime, every effort must be made to preserve ovarian function in any possible way.

We conclude that women who suffer from scleroderma or systemic sclerosis and want to pursue a pregnancy through surrogacy can be safely treated provided that there is close cooperation with the physician(s) managing the case, with thorough counseling and detailed preoperative assessment and anesthetic screening. The short protocol should be preferred for controlled ovarian hyperstimulation. If GnRH-a are to be used, the short-acting, rather than the long-acting, ones should be employed. As the life span nowadays for these patients is significantly prolonged, surrogacy may help them to achieve a pregnancy without compromising their general health, and this treatment option should be made available more often. The use of GnRH-a in an attempt to preserve ovarian activity before chemotherapy is administered requires further study.

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M. Tsirigotis<sup>1</sup>

D. Lammiman

I. L. Craft

London Gynaecology and Fertility Centre

Cozens House

112A Harley Street

London W1N 1AF, England

<sup>1</sup> To whom correspondence should be addressed.

## CAIRO, EGYPT

### Treatment of Recurrent Chocolate Cysts by Transvaginal Aspiration and Tetracycline Sclerotherapy

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## INTRODUCTION

Recurrent chocolate cysts after laparoscopic or conservative open surgery for endometriosis is a difficult clinical problem for those patients who wish to retain their childbearing potential. We previously reported the use of ultrasonic (US) transvaginal aspiration of endometriotic cysts as an op-

tional line of treatment in selected cases of endometriosis (1). Aspiration and sclerotherapy have been found to be an effective and safe outpatient procedure for the treatment of several cystic conditions including hydroceles (2), renal cysts (3), splenic cysts (4), and vaginal and vulval Gartner cysts (5).

The aim of the present work is to report the treatment of three cases of recurrent chocolate cysts after previous surgery for endometriosis by transvaginal aspiration and tetracycline sclerotherapy.

### CASE I

A 29-year-old nulliparous woman presented with pelvic pain and infertility of 7 years' duration. She was diagnosed with laparoscopy as having pelvic endometriosis and was treated with danazol, followed after 1 year by conservative surgery.

Two years later, the patient was referred to our IVF center for treatment of infertility and pelvic pain. Vaginal US revealed the presence of a unilateral cystic mass, 8 × 7 cm in diameter, with speckled homogeneous echogenicity. Transvaginal US-guided aspiration of the cyst was performed (1). Ninety milliliters of viscid dark fluid was aspirated and a strong negative pressure, up to 350 mm Hg, was required for complete evacuation of the cyst. Cytological examination revealed degenerated blood- and pigment-containing macrophages. Bacteriological examination revealed no organisms. Immediate relief of symptoms followed the procedure. Monthly US follow-up revealed gradual reaccumulation of fluid in the cyst, and 5 months later the cyst reached its preaspiration size.

After the approval of our ethical committee the patient was counseled for reaspiration and injection of tetracycline as a sclerosing agent in the cyst cavity. She was informed of the possibility of recurrence and infection and that this treatment was being performed for the first time. Eighty milliliters of chocolate material was aspirated and 15 ml of 3% tetracycline hydrochloride was injected in the cyst cavity. The patient developed mild pelvic pain which required no medication and she was sent home after 3 hr. Monthly follow-up of the patient for 12 months by vaginal US revealed no recurrence of the cyst and a marked improvement of her symptoms.

### CASE II

The patient was a 34-year-old, para 1 woman, who presented with secondary infertility of 6 years'

duration and distressing pelvic pain. She gave a history of a previous conservative surgery for pelvic endometriosis. Laparoscopy revealed the presence of a cyst in the right ovary, 6 × 6 cm in diameter, and endometriotic spots in the Douglas pouch. Sixty milliliters of chocolate material was aspirated through the laparoscopy and was sent for cytological examination. A biopsy was taken from the peritoneal lesions, which confirmed the diagnosis of endometriosis. US follow-up revealed recurrence of the endometriotic cyst, which reached its original size after 3 months. After counseling, transvaginal aspiration of 50 ml of chocolate material was performed, and 12 ml of 3% tetracycline hydrochloride was injected. The pain improved markedly and monthly follow-up by vaginal US for 12 months revealed no recurrence.

### CASE III

A 39-year-old nulliparous woman presented with long-standing infertility, severe dull pain in the pelvis, and a history of two previous conservative surgeries for extensive endometriosis, which was confirmed pathologically. Vaginal US revealed the presence of bilateral adnexal cysts 8 × 7 and 6 × 6 cm in diameter, with typical speckled homogeneous echogenicity. The patient refused hysterectomy as a radical treatment.

After counseling, aspiration of 70 ml of chocolate material from the right cyst and 60 ml from the left cyst was performed. Fifteen milliliters of 3% tetracycline hydrochloride was injected into each cyst. Marked improvement of pain followed the aspiration. Monthly US follow-up revealed that the cyst on the right side recollected after 3 months and the pain recurred. The recurrent cyst was 6 × 6 cm in diameter, with speckled homogeneous echogenicity. Reaspiration of 40 ml was done and 12 ml of 3% tetracycline hydrochloride was injected in the cavity. The patient suffered from severe pelvic pain which lasted for 5 hr. She received analgesics and was sent home 6 hr later with minimal pelvic discomfort.

Monthly follow-up by vaginal US for 12 months revealed that her symptoms improved markedly and the cyst did not recur, and pelvic examinations revealed normal findings.

### DISCUSSION

In this report US-guided aspiration of chocolate cysts was followed by immediate improvement of

pain and discomfort, however, recurrence of the cysts and the symptoms occurred in the three patients. It was reported previously that aspiration of endometriotic cysts was followed by a marked improvement of symptoms, but recurrence occurred if the endometrial lining was still active (1).

The increased interest in cost-effective outpatient therapy and the expected difficulty in surgical treatment of recurrent endometriotic cysts made aspiration and sclerotherapy of endometriotic cysts an attractive option. Tetracycline sclerotherapy was successful in two of our three patients after one injection and in the third patient after two injections.

The diagnosis of endometriosis was based on evaluation of the clinical picture, history, previous laparoscopy or laparotomy reports, and tissue biopsy examination. Furthermore, the aspirated fluid showed chocolate material and cytological examination suggested the diagnosis of endometriosis and the absence of malignant cells. The above data highly suggest an endometriotic origin of these chocolate cysts, although confirmation of the diagnosis is possible only after a biopsy from the cyst wall (6).

A side effect of this treatment is the pelvic pain and possible adhesions which may follow treatment due to leakage of tetracycline outside the cyst cavity. However, pain was not reported after sclerotherapy in different sites of the body (2–5). Aspiration and tetracycline sclerotherapy for three patients with splenic cysts caused no adhesions around the spleen or in the peritoneal cavity as determined by laparotomy at a later date (4). It is possible that the sclerotic effect of tetracycline requires contact with the lining epithelium for several hours at the same concentration. A small amount leaking from the cyst cavity will be diluted with the peritoneal fluid and will not be in close contact with a certain surface area for enough time to cause adhesions. However, in this study the procedure was performed only in cases of recurrent endometriotic cysts with extensive pelvic adhesions.

Tetracycline was chosen as the sclerosing agent because it is inexpensive, antibacterial, readily available, and a well-proven sclerosant agent used in the treatment of different conditions (2–5). Levine and Dewolf (2) suggested that the sclerosing action of tetracycline in the treatment of hydrocele is due to the acidic pH of the solution, which causes a cellular foreign body reaction, leading to adhesions and fibrosis of the secreting cells in the sac.

Aspiration of endometriotic cysts and sclerotherapy could be beneficial before admitting this group of patients for IVF treatment. It was reported previously that the presence of inflammatory cysts (7) and endometriotic cysts (8) during ovulation induction for IVF made US monitoring difficult, the ovarian response inadequate, and ovum pickup more intricate. It was also reported that the pregnancy rate improved significantly after aspiration of endometriotic cysts before ovulation induction for IVF (8).

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Mohamed A. Aboulghar<sup>1</sup>

Ragaa T. Mansour

Gamal I. Serour

Mehany Sattar

Abdel Megid Ramzy

Yehya M. Amin

The Egyptian IVF-ET Center  
Cairo University and El Azhar University  
Cairo, Egypt

<sup>1</sup> To whom correspondence should be addressed at The Egyptian IVF-ET Center, 85 Maadi Zeraie Road, Maadi 11431, Cairo, Egypt.