

● *Original Contribution*

ULTRASOUND-GUIDED INTERVENTIONAL THERAPY FOR RECURRENT OVARIAN CHOCOLATE CYSTS

LU-LU WANG, XIAO-QIU DONG, XIAO-HUI SHAO, and SI-MING WANG

Department of Ultrasonography, The Fourth Hospital of Harbin Medical University, Harbin, P. R. China

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Abstract—The aim of this study was to determine the effectiveness of ultrasound-guided interventional therapy in the treatment of postoperative recurrent chocolate cysts. The 198 patients enrolled in this study were divided into three groups. In group 1, the saline washing group, the cavity of the cyst was washed thoroughly with warm saline. In group 2, the ethanol short-time retention group, after washing with saline, the cyst was injected with 95% ethanol with a volume of half of the fluid aspirated from the cyst. Ten minutes later, the rest of the ethanol was aspirated. In group 3, the ethanol retention group, the procedures were the same as with the ethanol short-time retention group, except that 95% of the ethanol was retained in the cyst. An ultrasound examination was performed in the third, sixth and 12th months after therapy. The chocolate cyst cure rate was significantly higher in the ethanol retention group (96%, 66/69) than in the ethanol short-time retention group (82%, 56/68) and no case was cured in the first group (saline washing). We conclude that ultrasound-guided injection and 95% ethanol retention are an effective therapy for the treatment of postoperative recurrent chocolate cysts. (E-mail: dongxq0451@yahoo.com.cn) © 2011 World Federation for Ultrasound in Medicine & Biology.

Key Words: Ultrasound-guided, Postoperative recurrence, Ovarian chocolate cysts, 95% ethanol injection therapy.

INTRODUCTION

Ovarian chocolate cyst is a common hormone-dependent and refractory gynaecologic disease. Its incidence has risen in recent years, now reaching 3%–10% in woman of childbearing age. The main clinical symptoms are a progressive increase in dysmenorrhoeal (40%–60%), menstrual abnormalities and infertility (40%).

Traditional medical treatments for chocolate cysts, such as gestrinone or mifepristone, act through the induction of artificial menopause (Vercellini et al. 2009). Medical treatment is able to reduce the size of chocolate cysts but not completely remove ectopic endometrium. Conventional surgical treatment has the disadvantage of producing large wounds and, most importantly, contributing to a high recurrence rate (25%–40%) due to the extensive adhesions around the cysts (Le 2005). Vercellini et al. (1992) reported a recurrence rate of 80%–100% in patients who underwent laparoscopic drainage of endometriomas.

Ultrasound-guided interventional therapies have been used in the treatment of ovarian chocolate cysts for 20 years in clinical practice. The recurrence rates associated with this method have been reported to be between 10% and 98%. The wide range in the reported rate is due to variation among therapeutic modalities and a lack of a standard of care (Chan et al. 2003; Hsieh et al. 2009; Messalli et al. 2003; Kafali et al. 2003; Chang et al. 1997; Aboulghar et al. 1991; Giorlandino et al. 1993; Zanetta et al. 1995; Troiano and Taylor 1998). He et al. reported a 66% cure rate in 50 ovarian chocolate cyst patients who underwent ultrasound-guided ethanol injection. In the study, 25% of the injected volume was evacuated and medical ethanol was kept within the cysts for 10 min (He and Tang 2001). Koike et al. (2002) performed ultrasound-guided interventional therapy. In a study of 45 patients with chocolate cysts, the researchers injected 50% ethanol and kept the ethanol in the cysts for 5 min. After treatment, the recurrence rate was 13.3%. Li et al. (2004) treated 12 cases of ovarian chocolate cysts with a similar approach in which they injected ethanol into the cysts and evacuated 10%–20% of the volume. After 5–10 min, the ethanol was aspirated. The authors performed the procedure up to four times and then finally injected 5–20 mL of

Address correspondence to: Xiao-Qiu Dong, Department of Ultrasonography, The Fourth Hospital of Harbin Medical University, Yiyuan Str 37, Harbin, Heilongjiang Province 150001, P. R. China. E-mail: dongxq0451@yahoo.com.cn

ethanol into the cysts and did not aspirate the final ethanol added to the cysts. In these cases, the cure rate was 80%, though this study was limited by a small sample size.

Our study was designed to determine if a novel ultrasound-guided interventional therapy has a higher cure rate compared with other ultrasound-guided interventional therapies used to treat chocolate cysts. In this study, ethanol injection dosage was increased compared with previous studies but the ethanol was not aspirated from the cysts. The benefits of this procedure are preservation of ovarian function, minimal invasion, higher cure rates and lower recurrence rate.

METHODS

Patients

One hundred ninety-eight patients (205 lesions) aged from 20 to 49 years with postoperative recurrent ovarian chocolate cysts (either surgical or laparoscopic) were enrolled between January 2006 and November 2008. Of the 198 patients, 97 patients underwent surgical therapy and 101 patients underwent laparoscopic therapy. Notably, among these 198 patients, nine had uterine fibroids, two had adenomyosis and 25 had the history of miscarriage. All cysts in this study were simple cysts without septum.

The details of the procedure, safety, adverse effects and prognosis were discussed with each patient. All the patients signed informed consent forms prior to the procedure. This study was approved by the ethical committee (IRB) of The Fourth Hospital of Harbin Medical University, P. R. China.

Study groups

The 198 patients enrolled in this study were divided into three treatment groups:

Saline washing group (group 1): The cysts were washed thoroughly by warm saline.

Ethanol short-time retention group (group 2): The cysts were injected with 95% ethanol and a volume of half the cyst fluid was aspirated. Ten minutes after injection, the ethanol was aspirated.

Ethanol retention group (group 3): The same procedure was used as in the ethanol short-time retention group, except that the 95% ethanol was not aspirated from the cysts but instead was kept *in situ*.

Instruments, needles and drugs

A Technos MPX DU-8 (Esaote, Genoa, Italy) colour Doppler ultrasonic diagnostic apparatus with CA621 (3.5–5 MHz) and EC123 (7.0–12 MHz) probes and equipped with an adaptor for in-plane needle guidance was used. Disposable PTC needles (16- or 18-gauge PTC needle 20 cm in length, Hakko Co. Ltd. Chikuma-shi, Japan) were employed. All patients received a local

anaesthetic of 2% lidocaine (Fuxing Zhaohui Corporation, Shanghai, China). The 0.9% saline solution used in the experiments was produced by Tonghua Dongbao Medicine Incorporated Company (Tonghua, China). The 95% ethanol used was produced by the Qiqihar Disinfectant Factory (Qiqihar, China).

Patient evaluation prior to the procedure

Laboratory tests including complete blood count (CBC), urine examination (UR), electrocardiogram, chest X-rays, bleeding-time (BT) and clotting-time (CT) were performed on all patients prior to the procedure. The results of all tests were within the normal range. CA125 antigen levels were also tested in each patient to exclude malignant lesions (Patton *et al.* 1986; Kraśnicki 2001).

Ultrasound-guided interventional procedure

Patients took gestrinone orally up to 3 months after receiving ultrasound-guided interventional therapy. The ultrasonographic reports concerning the patient uterus and ovaries (location, size, shape of cysts) were kept in computerised medical records. To avoid accidental injury of the bladder, intestines and large blood vessels, either a transabdominal or transvaginal puncture was chosen according to the location of the cyst. The puncture site was initially disinfected and subsequently anaesthetised with 5 mL of 2% lidocaine. The probes were sterilised and the adaptor was fixed. The imaging plane for needle guidance was selected to avoid accidental injury of the intestine, the blood vessels and the bladder. To minimise peritoneal spillage of ethanol, a 16G or 18G PTC needle with a respective outer diameter of 1.61 mm or 1.26 mm were used. We injected 2% lidocaine (2–5 mL), withdrew the needle through the cyst wall and pressed the area during needle exit to prevent bleeding and ethanol spillover.

In the saline washing group, after complete evacuation of the cyst, the empty cavity of the cyst was washed thoroughly with warm saline (0.9%) until the colour of the aspirated fluid changed from chocolate-brown to clear. In the ethanol short-time retention group, the cysts were washed with warm saline until the evacuated solution was clear. Next, we injected ethanol (95%) into the cystic cavity, aspirated half of the cyst fluid volume and kept the ethanol in the cyst for 10 min before aspirating the rest of the ethanol. In the ethanol retention group, the procedures were the same as with the ethanol short-time retention group, except that 95% ethanol (maximum dose of 100 mL) was left *in situ*. All contents evacuated from cysts were referred for cytological analysis. Subsequently, ultrasonography on all patients was performed during follow-up visits in the third, sixth and 12th months after the procedures to detect recurrence and to evaluate the therapeutic efficacy of the ultrasound-guided interventional therapy among the groups.

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