

Endometrioma size is a relevant factor in selection of the most appropriate surgical technique: a prospective randomized preliminary study



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ABSTRACT

Objectives: To assess and compare the ovarian reserve in patients with different-sized endometriomas undergoing cystectomy or ablative surgery in order to determine the best surgical approach to safeguard healthy ovarian tissue.

Study design: Prospective randomized study on 48 patients with unilateral single ovarian endometriomas. Patients were allocated into two groups based on endometrioma size: <5 cm ($n = 26$, Group A, small endometriomas) and ≥ 5 cm ($n = 22$, Group B, large endometriomas). Each group was randomized to coagulation or excision treatment (1:1 ratio) before the procedure. Anti-Müllerian hormone (AMH) levels were evaluated before surgery and 3 months after surgery.

Results: Both ablation and excision resulted in a significant reduction in AMH level regardless of endometrioma size. A significant interaction effect was observed between endometrioma size and type of surgical technique (analysis of covariance p for interaction = 0.039): in Group A, no significant difference was found between the two surgical techniques ($-17.6 \pm 4.7\%$ vs $-18.2 \pm 10.6\%$), whereas in Group B, the excision group showed a significantly greater percentage decrease in AMH level compared with the ablation group ($-24.1 \pm 9.3\%$ vs $-14.8 \pm 6.7\%$, $p = 0.011$).

Conclusions: Both ablative and excision treatment of endometriomas have a negative effect on ovarian function. Endometrioma size is associated with the magnitude of ovarian reserve damage following excision treatment, but in the case of ablative treatment, the decrease in AMH serum level is independent of the size of the cyst. In surgical treatment of large endometriomas, the decrease in AMH level is more consistent and much more severe following cystectomy than ablation.

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Introduction

Ovarian endometriomas are cysts found in the ovaries with ectopic endometrial tissue lining. They occur in 17–40% of patients with endometriosis [1]. The origin of endometriomas is unknown; however, they may originate from progressive invagination of the ovarian cortex after accumulation of menstrual debris from the shedding of superficial active implants [2].

The most common procedure for the treatment of ovarian endometriomas involves opening and draining the cyst before

performing a cystectomy (stripping technique) or electrocoagulation of the cystic wall (ablative technique) [3].

Cystectomy has a more favorable outcome than ablation, with lower recurrence rates of endometrioma and higher rates of subsequent spontaneous pregnancies in infertile women [3,4]. However, the safety of both techniques has been questioned in terms of potential risk of significant damage to the ovarian reserve, defined as the reduction in number and quality of ovarian follicles [5,6]. Cystectomy may damage the ovarian reserve if the ovarian parenchyma surrounding the cyst is removed accidentally, and the energy used for ablation may cause thermal damage to the underlying ovarian cortex [3,7–9].

Consideration of the ovarian reserve is an important aspect in the treatment of infertile patients, in whom the endometrioma per se may seem to be responsible for suboptimal ovarian reserve [8,10]. Surgical treatment in these patients should consider the

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benefits in terms of symptom relief, risk of recurrence and potential damage to the ovarian reserve.

The effect of endometrioma size and the type of surgical technique on the magnitude of postsurgical ovarian damage has not been fully elucidated to date. Albeit with conflicting results, a wealth of studies in the literature have investigated the impact of excision surgery on the ovarian reserve [11]. However, a recent systematic review failed to find studies assessing the impact of ablation [12]. The available reports have conflicting results regarding the effect of endometrioma size on postsurgical ovarian damage. While some studies failed to document any significant relationship between endometrioma size and decline in the ovarian reserve, other studies have reported the magnitude of ovarian damage in relation to the size of the cyst [13–17].

Several techniques have been proposed for assessment of the ovarian reserve. In recent years, use of serum anti-Müllerian hormone (AMH) has gained popularity, and this is considered to be the most reliable and easily measurable marker of the ovarian primordial follicle pool.

AMH is a dimeric glycoprotein member of the transforming growth factor- β superfamily. In females, AMH is produced by granulosa cells, and it represents a reliable and useful marker of ovarian reserve. Its levels decline gradually as the primordial follicle pool diminishes [18–20].

The use of AMH as a marker of ovarian reserve offers several advantages over other endocrine tests such as follicle-stimulating hormone or inhibin-B. AMH is stable throughout the menstrual cycle, making measurement possible at any time. In addition, AMH is very sensitive to changes in ovarian reserve, and correlates well with ultrasonographic antral follicle count [21,22].

As such, this prospective randomized study was designed to assess and compare the impairment of ovarian reserve following ablative and excision treatment of patients with endometriomas of different sizes, using serum AMH level as the marker of ovarian reserve.

The aim of this study was to find sufficient evidence to determine the surgical approach of choice in terms of minimal trauma to healthy ovarian tissue.

Materials and methods

This randomized study was performed at the Reproductive Clinic of the Department of Obstetrics and Gynaecology, Federico II University Hospital, Naples, Italy. From January 2012 to March 2014, 76 women of reproductive age (22–38 years) with unilateral single, unilocular, ovarian endometriomas met the inclusion criteria. Exclusion criteria were: evidence of premature ovarian failure; previous ovarian surgery; autoimmune diseases; multilocular cysts; use of drugs affecting ovarian function [e.g. gonadotropin-releasing hormone (GnRH) analogues, danazol, oestrogen, etc.] within the last 6 months; endocrine diseases; and pregnancy.

Patients who met the study criteria and agreed to participate gave their written informed consent after being made aware of the two different surgical treatments, and were enrolled in the study. The study protocol was approved by the institutional review board of the study institution. The flow of patients through the study is illustrated in Fig. 1.

Seventy-six patients met the inclusion criteria, but seven of them refused to undergo the randomization process and were

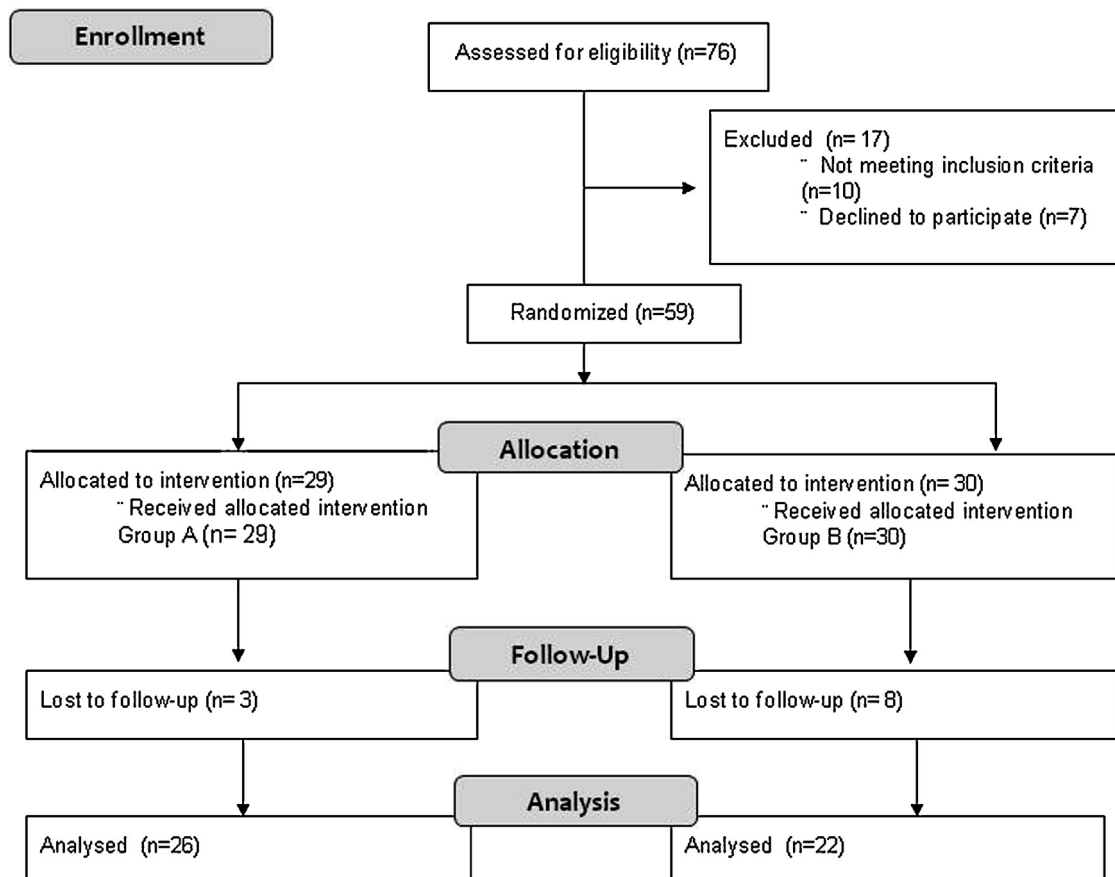


Fig. 1. The flow of patients enrolled in the study.

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