



Original research

Predicting success of single step hysteroscopic myomectomy: A single centre large cohort study of single myomas



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HIGHLIGHTS

- A retrospective cohort study of 1244 women undergoing hysteroscopic myomectomy is described.
- We analysed the feasibility of performing the hysteroscopic myomectomy in a single-step procedure.
- Grading and size of myomas and age of patients influence the feasibility of one step procedure.
- G2 myomas greater of 3 cm are correlated to a higher risk of a multiple procedure.

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ABSTRACT

Introduction: Submucous myomas represent one of the main indications of operative hysteroscopy. Hysteroscopic resection of submucous fibroids should be a simple, well-tolerated and effective procedure and ideally accomplished in in only one surgical step.

Methods: Retrospective cohort single Centre study of 1244 women undergoing hysteroscopic myomectomy. Data analysis included patients' and the myomas characteristics. A multiple logistic regression was carried out in order to assess which variables were able to determine a multiple step procedure.

Results: 1090 myomas (87.62%) were completely resected in a single-step procedure (SS group) whereas a multiple-step procedure (MS group) was needed for the removal of 154 fibroids (12.38%). The mean size of myomas resected in the SS group was 22.83 ± 9.36 mm whereas fibroids of the MS group measured 29.67 ± 10.76 mm. The overall feasibility of hysteroscopic myomectomy in one surgical procedure was 88.28%. All hysteroscopic myomectomies of G0 fibroids were completed in a single step. The chance of success to accomplish the treatment in a single-step for G1 and G2 myomas were 88.59% and 82.55%, respectively. The multivariate analysis revealed an inverse correlation between age and multiple step procedures and size of myomas were all directly correlated to multiple step procedures.

Conclusion: The grading, the size of the myomas and the age of patients play a crucial role in completing the hysteroscopic myomectomy in a single step. Only the diameter greater than 3 cm in G2 myomas is correlated to a higher risk of a multiple procedure.

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1. Introduction

With the advent of hysteroscopy, surgeons had the possibility to selectively remove intrauterine pathologies, avoiding a great

number of hysterectomies. Operative hysteroscopy offered numerous advantages for both the patient and the surgeon [1].

Submucous myomas represent one of the main indications of operative hysteroscopy. Since 1976 when Neuwirth and Amin reported the first five cases of excision of submucous myomas [2], several techniques have been developed in order to render hysteroscopic myomectomy a safe and effective procedure [3].

Hysteroscopic resection of submucous fibroids should be a simple, well-tolerated and effective procedure [4]. It is known that the number and the size of myomas may influence the final surgical

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outcome, but it is the treatment of myometrial portion the main obstacle faced by surgeon [1,3,5], as long as it reduces the chance of achieving a complete resection in one surgical session. In order to improve the control of related symptoms as menorrhagia, complete resection of fibroids is desirable [3,6]. However, regardless of the intramural development of myoma, hysteroscopic myomectomy should be ideally accomplished in only one surgical step.

We have therefore analysed procedures where only single myomas had been removed in order to report the chance of completing the treatment in a single step, according to the size and intramural development of myomas.

2. Material and methods

We retrospectively reviewed the series of consecutive patients who underwent hysteroscopic myomectomy at the “Arbor Vitae” Centre for Endoscopic Gynecology between January 2003 and December 2010. Institutional Review Board approval was obtained for data collection.

Differently from a previous report, in which the main outcome analysed was the safety and efficacy of the cold loop technique and therefore only myomas with intramural development were collected [7], a new series of patients was selected with the following criteria.

2.1. Inclusion criteria

Only patients with histologic confirmation of a myoma were collected. Intramural development was catalogued in accordance with the classification of the European Society of Gynaecological Endoscopy: G0: completely endocavitary, pedunculated myoma, with no intramural extension; G1: submucous myoma with less than 50% intramural extension; G2: submucous myoma with more than 50% intramural extension [6].

All myomas (G0, G1 and G2) were considered, but, in order to reduce a potential confounding factor and better analyse the feasibility in a single procedure of hysteroscopic myomectomy, only patients with a single myoma were enrolled in the study.

2.2. Exclusion criteria

Absence of histologic confirmation of a myoma; presence of multiple myomas in the uterine cavity; a free myometrial margin (FMM) of 2 mm or lower.

Before being scheduled for hysteroscopic myomectomy, all patients in the database were managed following our Institutional protocol:

Ultrasonography and outpatient diagnostic hysteroscopy were performed in order to diagnose the presence of myomas and to evaluate the characteristics of myomas (number, grading and size) and to measure the FMM. The diagnosis was wrong only in 35 cases where an adenomyosis was histologically detected and patients were excluded from the study. In case of myomas greater than 2 cm, three consecutive injections of gonadotropin-releasing hormone (GnRH) agonist (triptorelin 3.75 mg IM) were administered 28 days apart. Informed consent was obtained from all patients before the surgery.

In case of G0 myomas, hysteroscopic myomectomy was carried out by classical slicing using an electric loop powered by a 100 W monopolar current in pure cutting. The G1 and G2 myomas were removed by the cold loop technique, as described in previous reports [7]. All the procedures were performed by 4 surgeons with the same experience and skill level. A 9 mm resectoscope with 0° optical system (HOPKINSII® Karl Storz Tuttlingen, Germany) and 1.5% glycine as distension media were utilized to carry out

hysteroscopic myomectomies.

In case of 1000 cc of distension media deficit or sodium concentration lower than 125 mEq/l, the procedure was interrupted and a second-step was scheduled to accomplish the hysteroscopic treatment.

Antibiotic prophylaxis was never administered except for specific indication (e.g. cardiac valvulopathies).

Characteristics of patients were collected. Size, grading and duration of surgery (from the introduction of the resectoscope in the uterine cavity until the end of the procedure) for each myoma were analysed according to the number of procedures needed to accomplish the treatment (single-step or multiple-step). Multivariate analysis was carried out in order to assess which variables were able to determine a multiple step procedure.

2.3. Statistical analysis

The Mann–Whitney test was used to compare ordinal and non-normally distributed continuous variables (deviation from Gaussian distribution was checked by using the Shapiro–Wilk test). Categorical data were analysed by a χ^2 test with Yate's correction. A multivariate logistic regression model was fit to the prediction of a hysteroscopic myomectomy in a single-step surgical procedure (coded as yes = 1 and no = 0), incorporating as explanatory variables all the variables that showed a p-value ≤ 0.25 in bivariate analysis (nota). The goodness of fit for logistic regression models was checked using the Hosmer and Lemeshow test. Statistical analyses were performed using IBMSPSS® version 22.0 (IBM Corp., Armonk, NY, USA, 2013). A two-sided p-value < 0.05 was considered significant.

3. Results

A total of 1244 patients satisfied the above-mentioned criteria and were selected from our database.

The main indications for the surgery were menorrhagia, intermenstrual spotting, infertility and post-menopausal bleeding. Characteristics of patients are reported in Table 1. 1090 myomas (87.62%) were completely resected in a single-step procedure (SS group) whereas a multiple-step procedure (MS group) was needed for the removal of 154 fibroids (12.38%). Patients in SS group were significantly older than in MS group ($p = 0.0001$). A significant correlation with MS procedure was seen with a longer duration of surgery ($p = 0.0001$) and with GnRH administration (OR 3.839; 95% CI 2.595–5.680; $p = 0.0001$).

Characteristics of myomas resected according to the grading, the size and the number of procedures needed to accomplish the treatment are summarized in Table 2. A total of 1409 procedures were performed in order to remove 1244 myomas. Among the MS group, one patient needed four procedures to accomplish the treatment while nine needed three. The mean size of myomas

Table 1
Characteristics of study groups.

	Single step	Multiple step	p
Patients	1090	154	–
Age (years) ^b	43.23 ± 8.35	40.16 ± 6.32	0.0001
Nulliparous. n(%)	670 (61.47)	104 (67.53)	0.172
Pluriparous. n(%)	420 (38.53)	50 (32.47)	
Previous cesarean section. n(%)	172 (15.77)	20 (12.98)	0.583
GnRH agonist therapy. n(%)	502 (46.05)	118 (76.62)	0.0001 ^a
Length of procedure (min) ^b	13.74 ± 9.23	19.9 ± 15.82	0.0001

^a O.R. 3.839 (2.595–5.680).

^b Data are reported as mean ± SD.

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