

Follow-up study of symptomatic submucous fibroids after hysteroscopic myomectomy

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Summary

Purpose of investigation: This study aimed to estimate the effectiveness of hysteroscopic myomectomy for symptomatic submucous uterine fibroids and to identify prognostic factors for persistent or recurrent symptoms. **Materials and Methods:** A total of 237 patients who underwent hysteroscopic myomectomy were divided into three groups according to the classification of the European Society for Gynaecological Endoscopy: Type 0 (n=116), Type I (n=97), and Type II (n=24). Medical records and videotape records of all patients were retrospectively reviewed. **Results:** Improvement of symptoms was achieved in 100% of Types 0 and I, and 66.7% of Type II. The five-year cumulative symptom-free rates after hysteroscopic myomectomy were $96.7\% \pm 1.9\%$, $87.8\% \pm 6.7\%$, and $44.5\% \pm 12.7\%$ in Types 0, I, and II, respectively. The mean symptom-free periods were 46.2 ± 2.6 , 47.7 ± 2.7 , and 24.7 ± 6.3 months in Types 0, I, and II, respectively. Logistic regression analysis showed that co-existence of other myomas and Type II were independent prognostic factors for recurrence of symptoms. **Conclusion:** Type I fibroids are a good indication for hysteroscopic myomectomy. In Type II, some patients feel that their symptoms improve, but this curative effect could be temporary.

Key words: Hysteroscopic myomectomy; Symptomatic submucous fibroid.

Introduction

Uterine fibroids are a relatively common disease in reproductive-age women, with a prevalence of 20–25% [1] or more [2]. Most myomas are asymptomatic and discovered incidentally during clinical examinations or ultrasonography [3]. Submucous fibroids comprise only 5–10% of fibroids, and submucous fibroids often cause serious bleeding or fertility problems [4]. Symptoms of submucous fibroids include menorrhagia, prolonged menstruation, and intermenstrual bleeding, and cause unpleasantness and severe anemia [5]. Some types of surgical management are considered in such cases with abnormal uterine bleeding. Hysteroscopic myomectomy is one of the most common gynecological procedures for the treatment of submucous fibroids. This method is known as not only a minimally invasive approach, but also as a procedure that is able to manage intrauterine lesions with a direct view without incision of the uterus [6–8]. In the present study, the authors evaluated the efficacy of hysteroscopic myomectomy for submucous fibroids on improvement of symptoms.

Materials and Methods

The present authors' criteria for hysteroscopic myomectomy were as follows: i) symptomatic submucous fibroids (including abnormal uterine bleeding and infertility), ii) protruding ratio of the myoma into the uterine cavity > 25%, iii) a distance greater than five mm between the serosa and the myoma, and iv) size of

the myoma < four cm. In this study, the authors focused on evaluation of improvement of symptoms of abnormal uterine bleeding. Therefore, cases of infertility were excluded. Preoperative sonohysterography, magnetic resonance imaging, or both were performed in all of the patients to determine the size, number, localization, and protrusion rate of the myoma into the uterine cavity. From January 1995 to December 2005, 237 patients with symptomatic uterine fibroids met these criteria. Patients were divided into three groups by the degree of myometrial penetration of the submucous fibroid according to the classification of the European Society for Gynaecological Endoscopy [9]. Type 0 (116 patients) included the pedunculated type or complete intracavitary fibroids, Type I (97 patients) had a large part (> 50%) of fibroids in the uterine cavity, and Type II (24 patients) had a large part (> 50%) of fibroids in the myometrium.

Electrosurgical resection was performed by a 26-Fr resectoscope with a monopolar electrosurgical unit. D-sorbitol 3.0% was used to distend the uterine cavity with a pressure of 80 mmHg. This procedure was performed during the early proliferative phase of the subsequent menstrual cycle under general anesthesia. All hysteroscopic surgeries were performed by senior surgeons who were authorized by internal regulations of the hospital. No difference in skill levels for conducting the hysteroscopic surgery was noted. No hormonal or antihormonal treatment was administered before surgery. Fluid monitoring was mandatory and if the fluid deficit reached 750 ml, serum electrolytes were routinely monitored. The procedure was terminated when the fluid deficit was > 1,000 ml.

The medical records and videotape records of all of the patients were retrospectively reviewed. The authors evaluated changes in symptoms by an interview with the patients every six months.

Statistical analysis was performed using JMP ver. 9. The Stu-

Table 1. — *Clinical features and surgical outcomes of patients with and those without recurrence of symptoms.*

	No recurrence	Recurrence	<i>p</i> value
No. of patients	208	29	
Age (years, mean ± SE)	42.9±0.52	40.3±1.11	0.04
No. of patients in groups divided by the degree of myometrial penetration of the fibroid (%)			
Type 0	113 (97.4)	3 (2.6)	
Type 1	87 (89.7)	10 (10.3)	0.019
Type 2	8 (33.3)	16 (66.7)	<0.001
Maximum diameter of the fibroid (mm, mean ± SE)	31.3±0.74	29.7±1.93	0.684
Operation time (min, mean ± SE)	44.1±2.16	51.1±5.13	0.231
No. of patients with complete fibroid resection (%)	189 (90.9)	13 (44.8)	<0.001
Resection ratio of the fibroid (%; mean ± SE)	96.1±0.9	63.3±7.7	<0.001
No. of patients with co-existence of other myomas (%)	39 (18.8)	12 (41.4)	0.003

Table 2. — *Logistic regression analysis of factors related to the recurrence of symptoms.*

Variable	Odds ratio	95% CI	<i>p</i> value
Age	6,169	0.601-67.784	0.126
Groups			
Type 0			
Type 1	3,363	0.954-15.711	0.06
Type 2	32,963	4.522-284.868	<0.001
Maximum diameter of myoma	0,954	0.049-24.224	0.976
Resection ratio of fibroid	3,15	0.264-38.321	0.36
Co-existence with other myomas	4,019	1.403-11.808	0.01

95% CI = 95% confidence interval.

dent's *t*-test and chi-square test were used to assess the associations between categorical variables. Univariate analysis of the possible risk factors for recurrence followed by forward step-wise variable selection and logistic regression analysis were performed to estimate confounding factors. Differences in the symptom-free period between groups were analyzed by applying Kaplan-Meier estimates and log-rank tests. All data are presented as mean ± standard error (SE) and statistical significance was set at a value of *p* < 0.05.

Results

The median follow-up time was 43 months (range 10–137). Recurrence of symptoms occurred in 29 of 237 (12.2%) patients. Clinical features and surgical outcomes of patients with or without recurrence are shown in Table 1. There were no significant differences in the maximum diameter of fibroids and operation time between patients. The mean resection ratio of fibroids at the operation was significantly higher in the recurrent group (96.1% ± 0.9%) than in the non-recurrent group (63.3% ± 7.7%). A total of

Table 3. — *Clinical features and surgical outcomes in groups divided by the degree of myometrial penetration of the submucous fibroid.*

	Type 0	Type 1	Type 2
No. of patients	116	97	24
<i>Clinical features</i>			
Age (y, mean±SE)	43.7±0.69	41.5±7.2 ^a	41.3±1.51
Maximum diameter of myoma (mm, mean ± SE)	32.7±1.09	29.6±9.2 ^b	29.5±2.01
No. of patients with co-existence of other myomas	19 (16.3%)	23 (23.7%)	9 (37.5%) ^c
<i>Surgical outcome</i>			
Operation time (min, mean ± SE)	38.6±2.63	49.9±32.6 ^d	55.8±30.1 ^e
No. of patients with complete fibroid resection	114 (98.3%)	85 (87.6%) ^f	3 (12.5%) ^{g,h}
Resection ratio of fibroid (%; mean ± SE)	99.8±0.12	95.6±12.7 ⁱ	40.2±33.2 ^{j,k}
No. of patients whose symptoms improved	116 (100%)	97 (100%)	16 (66.7%) ^{l,m}
No. of patients whose symptoms recurred	3 (2.6 %)	10 (10.3%)	8 (50.0%) ^{n,p}
No. of patients who required further surgical treatment	1 (0.9%)	7 (7.2 %) ^q	6 (25.0%) ^{r,s}

a: *p*=0.03 vs Type 0, b: *p*=0.04 vs Type 0, c: *p*=0.02 vs Type 0 d: *p*=0.01 vs Type 0, e: *p*=0.01 vs Type 0, f: *p*=0.002 vs Type 0, g: *p*<0.001 vs Type 0, h: *p*<0.001 vs Type 1, i: *p*=0.002 vs Type 0, j: *p*<0.005 vs Type 0, k: *p*<0.005 vs Type 1, l: *p*<0.001 vs Type 1, m: *p*<0.001 vs Type 2 o: *p*<0.001 vs Type 0, p: *p*<0.001 vs Type 1, q: *p*=0.02 vs Type 1, r: *p*<0.001 vs Type 0, s: *p*<0.05 vs Type 1.

41.4% of patients in the recurrent group were accompanied by other co-existent fibroids and this ratio was significantly larger than that in the non-recurrent group (18.8%).

To estimate the prognostic factors of recurrence of symptoms, univariate analysis followed by forward step-wise variable selection and logistic regression analysis were performed (Table 2). Co-existence of other fibroids and a high degree of myometrial penetration of the submucous fibroid were the strongest predictors of recurrence of symptoms. Patients were shown to be significantly younger (*p* = 0.04) in the recurrent group than in the non-recurrent group in univariate analysis (Table 1). However, multivariate analysis did not show age as a prognostic factor of recurrence of symptoms.

The authors also evaluated clinical features and surgical outcomes in the three groups of Type 0, I, and II (Table 3). There was no significant difference in the diameter of fibroids among the three groups. The operation time of patients with Type 0 was significantly shorter than that in patients with Type I (*p* = 0.01) and Type II (*p* = 0.01). There was no significant difference in operation time between Types I and II. Complete fibroid resection was achieved in 98.3%, 87.6%, and 12.5% in Types 0, I, and II, respectively.

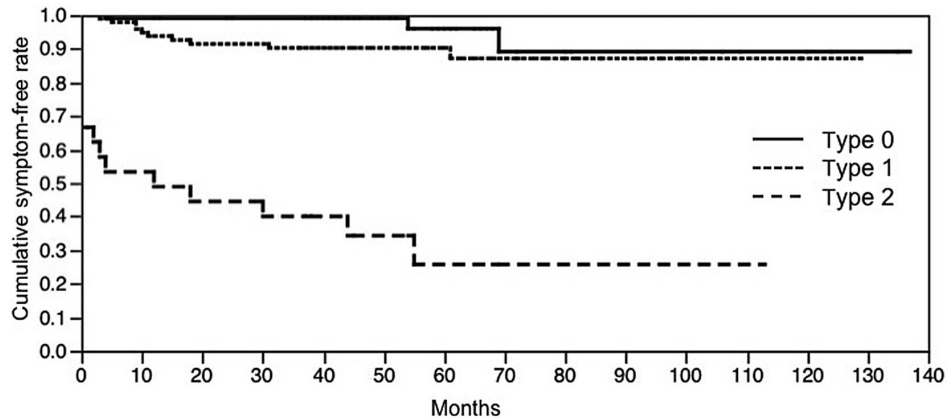


Figure 1. — Cumulative symptom-free rate after hysteroscopic myomectomy. The mean five-year cumulative symptom-free rates after hysteroscopic myomectomy, as calculated by Kaplan-Meier analysis, were $96.7\% \pm 1.9\%$ (SE), $87.8\% \pm 6.7\%$ (SE), and $44.5\% \pm 12.7\%$ (SE) in Types 0, I, and II, respectively. The mean symptom-free periods were 46.2 ± 2.6 , 47.7 ± 2.7 , and 24.7 ± 6.3 months in Types 0, I, and II, respectively. There was no significant difference in recurrence of symptoms between Types 0 and I. However, recurrence of symptoms in Type II was significantly more frequent than that in Types 0 ($p < 0.001$) and I ($p < 0.001$).

The mean resection ratio of Type 0 was significantly higher than that of Type I ($p = 0.002$) and Type II ($p < 0.005$). Additionally, the mean resection ratio of Type I was significantly higher than that of Type II ($p < 0.005$). Relief of symptoms was achieved in 100% of patients with Types 0 and I, and in 66.7% of those with Type II. The mean five-year cumulative symptom-free rates after hysteroscopic myomectomy, as calculated by Kaplan-Meier survival analysis, were $96.7\% \pm 1.9\%$, $87.8\% \pm 6.7\%$, and $44.5\% \pm 12.7\%$ in Types 0, I, and II, respectively (Figure 1). The mean symptom-free periods were 46.2 ± 2.6 , 47.7 ± 2.7 , and 24.7 ± 6.3 months in Types 0, I, and II, respectively. There was no significant difference in recurrence of symptoms between patients with Types 0 and I. However, patients with Type II had a significantly more frequent recurrence of symptoms than those with Types 0 ($p < 0.001$) and I ($p < 0.001$).

Discussion

Hysteroscopic myomectomy is an effective, minimally invasive, surgical approach for submucous fibroids. However, this treatment may not be optimal for all patients with submucous fibroids. Therefore, the prognostic factors for submucous fibroids need to be determined and indications for surgery need to be recognized. Several reports have shown that the size of fibroids and a high degree of myometrial penetration of submucous fibroids are the most important prognostic factors for successful resection of fibroids [9-11]. In the present authors' criteria, a fibroid > four cm is out of adaptation for hysteroscopic myomectomy originally. Therefore, the size of fibroids was not recognized as a prognostic predictor in this study. Hart *et al.* [11] also showed that patients with Type II fibroids were more

likely to require further surgery than those with Type 0 or I fibroids. In the present study, the degree of myometrial penetration of the submucous fibroid was the most important predictor for successful resection of fibroids and recurrence of symptoms. The resection ratio of fibroids and the complete resection ratio were significantly lower in patients with recurrence of symptoms than those without recurrence of symptoms, but these differences were not significant. The authors speculate that the significance of Type II fibroids as a prognostic predictor might be caused by unsuccessful resection of fibroids.

In the present study, co-existence of other fibroids was also a strong predictor of recurrence of symptoms. This is an interesting result, but simple to imagine such lesions cause a symptom to recur by progression of time, especially in relatively younger women. These lesions might be a therapeutic limitation for hysteroscopic myomectomy and a cause of further surgery.

There are several limitations in this study. Because the authors focused on evaluation of improvement of symptoms of abnormal uterine bleeding, cases of infertility were excluded. Data collection was retrospective and relatively larger fibroids were outside of the authors' criteria, both of which lead to inherent biases.

Conclusion

Submucous fibroids that protrude more than 50% into the uterine cavity are recognized as a good indication for hysteroscopic myomectomy because complete excision and relief of symptoms are achieved in most patients, with little recurrence of symptoms. In Type II fibroids, removal of fibroids is challenging because the larger part of the fibroid is not resected in most patients. However, removal of just

the intra-uterine part of the fibroid usually leads to a reduction in uterine bleeding. Although the curative effect is temporary, two-thirds of patients with Type II fibroids feel that their symptoms improve. It could be a candidate of treatment for premenopausal women. Endometrial ablation or resection at the time of hysteroscopic myomectomy may improve control of bleeding [12, 13]. Co-existence of unapproved fibroids, such as intramural or subserosal fibroids, is an independent prognostic factor for recurrence of symptoms. A proper explanation regarding recurrence of symptoms must be carried out for such a patient before surgery.

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