

## Video Article

### The blooming phenomenon: a rare but a dilemma in hysteroscopic resection of myomas

#### Tahermanesh et al. The blooming phenomenon

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#### Abstract

Modern surgical technologies allow gynecologists to treat most submucosal myomas by some form of resection hysteroscopically. What appears on imaging or direct visualization to be a submucosal myoma can be a single tumor, or may represent multiple smaller myomas appearing as one, compacted together in a typical pseudo capsule. During myoma resection, the effect of the distending media can be different depending on the morphology of the myomas. After starting resection, the power of distending media can push truly solitary myoma to somewhat flatten against the uterine wall. However, in the second type of myoma, the fluid can push the myomas into the uterine cavity, similar to the blooming of a flower. The tip of the hysteroscope may enter the dissected spaces between the myomas, impairs the panoramic view. This event can be a cause of failure of hysteroscopic myomectomy to adequately treat the myomas encountered. In this study, blooming phenomenon is introduced, the problems created by this phenomenon and solutions for its management are considered.

**Keywords:** leiomyoma; submucosal myoma resection; fibroid; hysteroscopy

#### Introduction

Uterine leiomyomas, fibroids or myomas are the most common benign tumors in reproductive-age women in the world (1, 2). Submucosal myomas (FIGO type 0, 1, 2) that derive from myometrial cells just below the endometrium (3) are estimated to be the cause of 5 – 10% of cases of irregular bleeding, pain, subfertility, and infertility (4, 5). The advancement of endoscopic surgical techniques have resulted in a better ability to remove submucous uterine fibroids (6, 7). Nowadays, the gold standard in the treatment of

submucous myoma is hysteroscopic myomectomy (7). Different techniques and instruments have been introduced for the better removal of submucosal myomas (7, 8). Since hysteroscopic morcellator devices (e.g. Myosure) or other modern interventional and mostly cost-intensive facilities are not widely available, in many hospitals, submucosal myoma removal still is performed by a resectoscope (9). Therefore, the submucosal myomas' removal by a resectoscope carries greater risk than other techniques, due to the potential complications related to the procedure, such as cervix laceration, hemorrhage, uterine perforation, or clinical intravasation syndrome (8, 10, 11). Based on the previously published documents, hysteroscopic submucosal myomectomy's outcomes are influenced by characteristics of submucous myoma (8, 12), pseudocapsule fibroid, and by the techniques used to remove the myomas (8). So, in this study, we intend to address the dilemma entitled "the blooming phenomenon" that may occur during hysteroscopic submucosal myomectomy with loop resection. This phenomenon creates the main problems during hysteroscopy that it is needed to be discussed.

### **The blooming phenomenon**

A pelvic sonography can show submucosal myomas in two different ways: a) genuinely solitary (Figure 1A), or b) apparently singular, indeed multiple myomas situated together, compacted within a typical pseudo capsule (false solitary myoma) (Figure 1B). When submucosal myoma resection carried out for the former type of myoma, at times, the pressure of distending media can lead to pressing and flattening of the myoma into and against the uterine wall (Figure 2). At times it is necessary to reduce the pressure of media in order to allow the myoma to protrude more into the uterine cavity and become more visible. In the second type of myoma, once the resection begins and the pseudo capsule opens, the fluid entering the spaces between the myomas and this in association with the physical property of myomas to get rid of intracapsular compression and escape outward, makes extrude them more forward and laterally (Figure 3). This is similar to the blooming of a flower at the time that the bud bursts and the sepals (the small green leaf-like covering of the buds) fusions are lost and the petals open. Therefore, it is noted that the pressure of the distending media can lead to different effects based on different types of submucous myomas once the resection starts, the first type is pressed against the uterine wall unlike the second type which is more protruded into the uterine cavity space (Figure 1).

Another necessary consequence of the protrusion of the myomas described above is that it reduces the distance between the lens of the hysteroscope and the leading edge of the myomas, which impairs the panoramic view obtained (Figure 4A). Besides, the tip of the hysteroscope may enter the dissected spaces between the myomas (Figure 4B), which may lead to stop operation while the myomas are not completely removed or inadvertent resection of the deeper areas of the myometrium and increase the risk of uterine wall perforation.

To manage of the problem noted, several steps are suggested:

1. The administration of 2-3 months of Gonadotropin-Releasing Hormone agonist pre-op, when there is no specific pathology in the endometrium, decreases the size of myomas aimed at shrinking myomas with improving panoramic view and it leads to endometrial atrophy which can reduce the absorption of fluids during the procedure.
2. The use of imaging by ultrasound and/or MRI would be useful in differentiation of genuinely solitary from apparently singular myoma which includes collections of smaller myomas.
3. It is best to avoid small vertical or horizontal resections of the myoma (Figure 5D), and it is better to place the tip of the resecting device near to the junction of myoma and the uterine wall and resect obliquely from the base to the tip (Figure 5E). This reduces the chance that the myomas would protrude into the cavity and limit visualization.

In summary, although the blooming phenomenon is rare, it might occur to have some problems during a hysteroscopic resection, so surgeons should be aware of the existence of this phenomenon, to prevent potential complications and to know the correct management.

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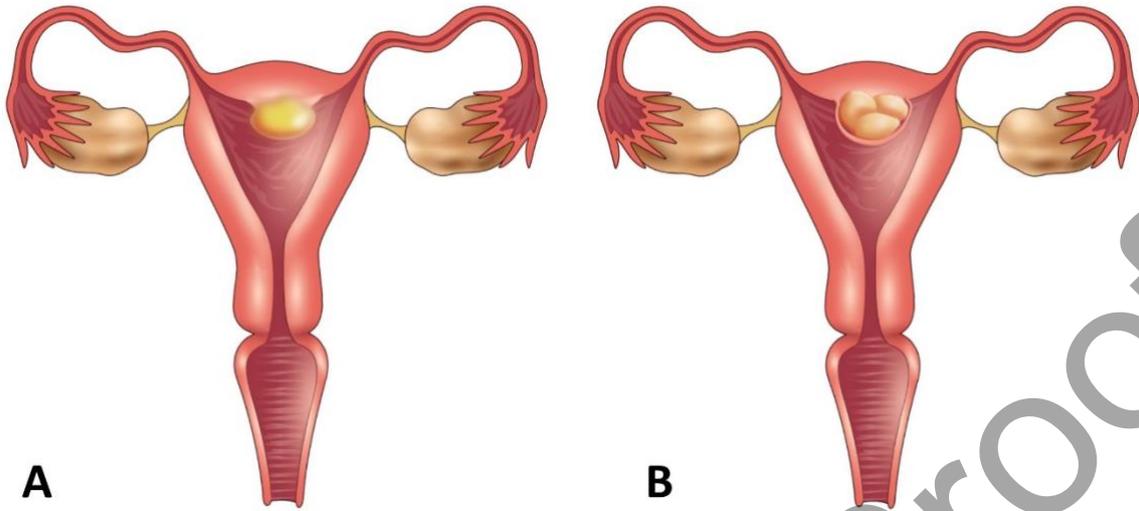
**Video 1.** <https://www.doi.org/10.4274/jtgga.galenos.2021.2021.0006.video1>

**Conflict of Interest:** No conflict of interest is declared by the authors.

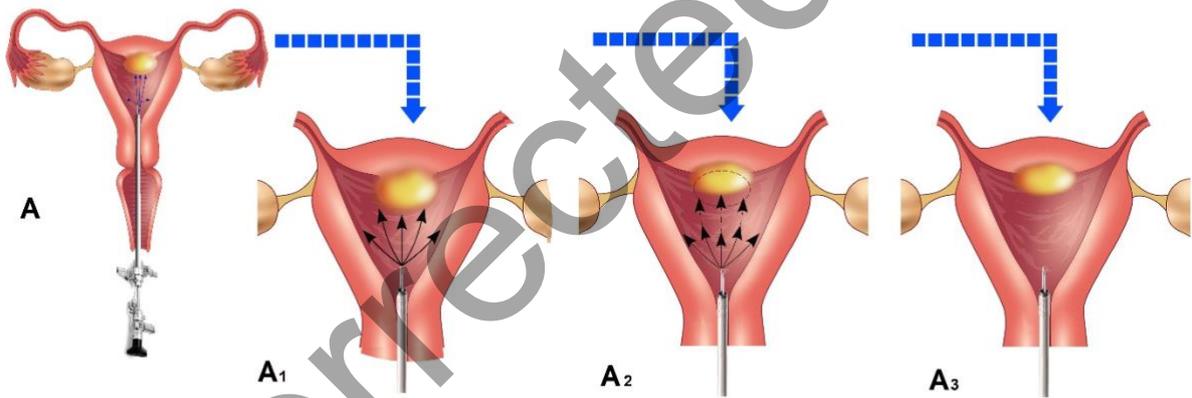
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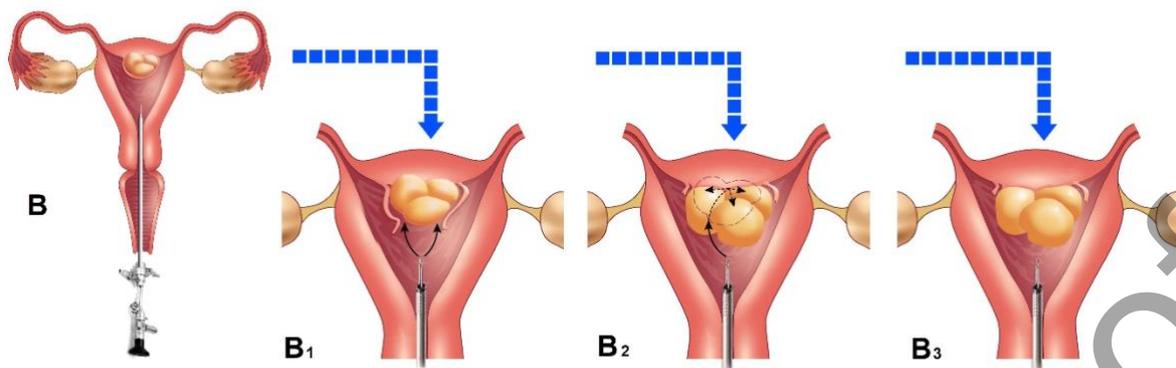
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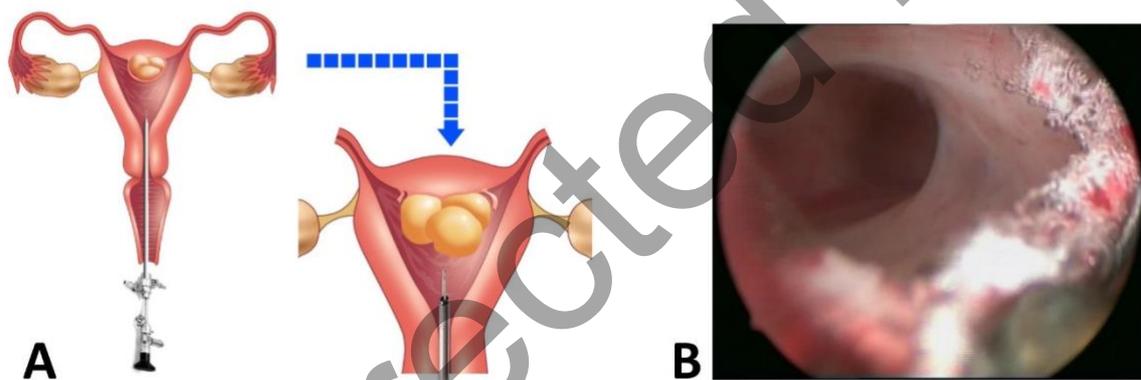
**Figure 1.** (A) Solitary submucosal myoma and (B) Apparently solitary, indeed multiple submucosal myomas



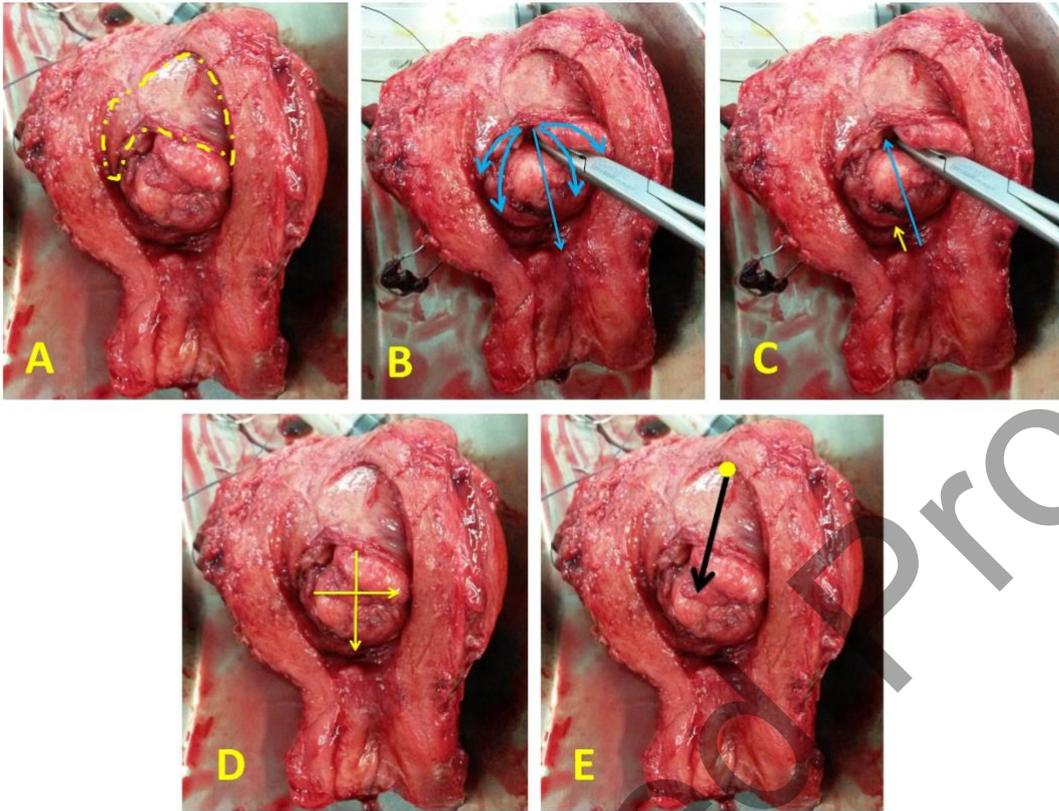
**Figure 2.** (A) solitary submucosal myoma, (A<sub>1</sub>) arrows show the pressure of distending media on myoma, (A<sub>2</sub>) pressing and flattening of the myoma (A<sub>3</sub>) flattened myoma due to pressure of distending media



**Figure 3.** (B) resection of false solitary myoma, (B<sub>1</sub>) pseudo capsule opens due to resection, (B<sub>2</sub>) fluid entering the spaces between the myomas, and (B<sub>3</sub>) intracapsular compression released and led to extrusion of myomas by fluid entrance



**Figure 4.** (A) schematic view of dissected spaces between the myomas and (B) real hysteroscopic view of dissected myoma which shows the inadvertent resection of the deeper areas of the myometrium



**Figure 5.** Hysterectomy of the same patient in figure 4(B) with failed hysteroscopic myomectomy, (A) the yellow dotted line represents the pseudo capsule of myoma, (B) blue arrows indicate the directions of protrusions of the myomas after partial resection of pseudo capsule, (C) blue arrow indicates the distance between tip of telescope and myoma before dissection of pseudo capsule, while the yellow arrow demonstrates the reduction of this distance after dissection of pseudo capsule, (D) vertical and transverse resection direction of myoma which should be avoided, and (E) black arrow represents the correct direction of the resection