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REVIEW PAPER

Hysteroscopic myomectomy

Karolina Piecak, Paweł Milart

3rd Chair and Department of Gynecology, Medical University, Lublin, Poland

Abstract

A new International Federation of Gynecology and Obstetrics classification for myomas was recently described. Type 0, 1 and 2 are the submucosal fibroids. Submucous myomas represent one of the main indications for operative hysteroscopy. Hysteroscopic resection of submucous fibroids should be a simple, well-tolerated procedure and ideally finished in a single surgical step. Hysteroscopic myomectomy is an effective procedure. Fertility outcome and menorrhagia are improved by this procedure. However, for menorrhagia, a recurrence can occur mainly during the first year following the surgery. For bleeding outcome, a success rate from 70 to 99% has been reported by different studies. The success rate seems to decline as the follow- up period increases. For fertility outcome, submucosal fibroids have negative impact on pregnancy rates. The size of the fibroids plays a crucial role in completing the hysteroscopic myomectomy in a single step. A diameter greater than 3 cm in type 2 myomas results in a higher risk of a multiple procedure.

Key words: hysteroscopic myomectomy, submucous myomas.

Introduction

Various classifications of myomas can be found in the literature. In 2011 the FIGO classification was published describing eight types of fibroids. This classification shows a more representative and understandable scheme of fibroid distribution and is already being used for creating new algorithms. Types 0, 1 and 2 are the intracavitary fibroids. Type 0 is completely intracavitary, type 1 has its largest diameter in the uterine cavity and type 2 has its largest diameter in the myometrium [1, 2].

Hysteroscopy provides surgeons the possibility to selectively remove intrauterine pathologies, thus avoiding numerous hysterectomies. Operative hysteroscopy offers a lot of advantages for the patient and the surgeon. One of the advantages of hysteroscopic procedures is that it is possible to treat pathological findings at the same time.

One of the main indications for operative hysteroscopy are submucous myomas. In 1976 Neuwirth and Amin described the first case of excision of submucous myomas. Since that time hysteroscopic myomectomy has been developed and has become a safe and efficient procedure.

Hysteroscopic resection of submucous fibroids should be a simple, effective, well-tolerated procedure. The number and the size of myomas may influence the final outcome. In order to relieve fibroid symptoms, such as menorrhagia, complete resection of fibroids is desirable. Hysteroscopic myomectomy should be ideally performed in a single surgical step [3].

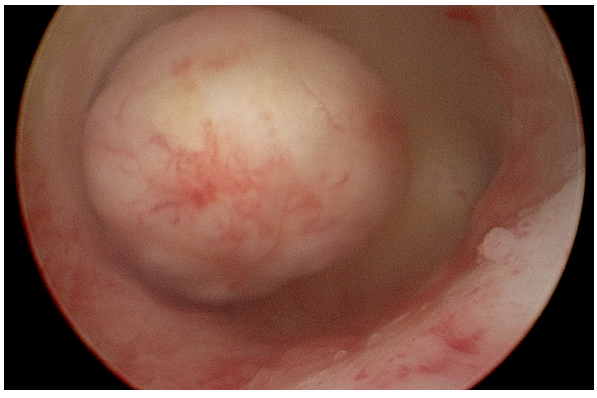

Fig. 1. Hysteroscopic image of a type 0 fibroid

Surgical techniques and one step surgery

Type 0 myoma resection

For less than 2 cm myomas, the base of the myoma is resected at the endometrium level and the myoma is extracted with the loop or blindly with a curette. For fibroids larger than 2 cm a progressive regression from the surface of the myoma toward the endometrium has to be performed. A hysteroscopic view of a type 0 fibroid is shown on Fig. 1.

Corresponding author:
Paweł Milart at Medical University of Lublin, 3rd Chair and Department of Gynecology, Jaczewskiego 8, 20-954 Lublin, Poland, phone number: +48 81 724 48 48, fax number: +48 81 724 48 47, e-mail: pmilart@gmail.com

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Type 1 or type 2 myoma resection

Resection is done from the intracavitary layer of the myoma up to the myometrium. The myometrium is recognizable as pink and it bleeds more easily than fibroid tissue. In difficult cases, the procedure can be stopped and continued at another time. For submucosal myoma of the uterine horn, special care is required to avoid injury of the tubal ostium or perforation of the uterus.

Mazzon *et al*. have analyzed the possibility of performing the hysteroscopic myomectomy in a single surgical procedure, according to the FIGO type and the size of myoma. In their series, the overall chance to accomplish the treatment in a single-step procedure was 88.28%. Due to the lack of the intramural component of myomas, all type 0 myomas were resected in only one surgical procedure by classical slicing. Concerning type 1 and type 2 myomas, the need for a multiple procedure occurred mainly in type 2 myomas. Myomas with intramural development were treated with the cold loop technique. Recently the cold loop hysteroscopic myomectomy was described as a safe and effective procedure for the removal of submucous myomas with intramural development, respecting the anatomical and functional integrity of myometrium. Their findings showed a high probability of success in one step surgical procedure (88.59% and 82.55% respectively) even in the cases of type 1 and type 2 fibroids.

The cold loop myomectomy was performed in order to prevent damage of the myometrium surrounding the myoma. The mechanical enucleation of the intramural part of myoma is safer and more effective when compared to the slicing and prevents complications such as thermal loop uterine perforation. Moreover, the procedure prevents electrical energy from being in contact with the myometrium and inducing thermal damage, which can increase the formation of intrauterine adhesions. Several authors support the use of bipolar energy because it may prevent the intravasation syndrome. Mazzon *et al*. have stated that surgical complications could be avoided following a rigorous intraoperative control of distension medium balance (saline solution or glycine) and sodium concentration when monopolar energy is used.

In this study no uterine perforation with thermal loop or intravasation syndrome was recorded. Avoiding multiple procedures allows to reduce the risk of intraoperative complications and improves patients' satisfaction. These results seem to confirm that hysteroscopic myomectomy is a good option for treating submucous myomas with a high possibility of accomplishing the treatment in single-step surgical procedure. A majority of type 0 myomas can be removed in only one surgical procedure, regardless of the size. The grading and the size of the myomas and the age of patients play a main role in completing the procedure in a single step. Fibroid diameter greater than 3 cm in type 2 myomas was correlated with a higher risk of a multiple procedure [2-5].

Outcome and complications

Mechanical complications

Uterine perforation most often occurs during cervical dilatation. That can be caused by cervical stenosis, severely retroverted or anteverted uterus and in nulliparous or postmenopausal women. Perforation during electro-resection can lead to intestinal, bladder or vessel injury. This complication is uncommon but its rate increases in the case of fibroids with intramural component. A concomitant laparoscopy is recommended in these cases to decrease the risk of such complications [2].

Infection

Postoperative endometritis occurs in 1-5% of patients. A prophylactic antibiotic dosage intraoperatively is recommended to limit the number of infections [2].

Bleeding

In the case of severe bleeding, a Foley catheter filled with 30 ml of isotonic saline can be inserted into the uterine cavity [2].

Metabolic complications

Intravasation of the fluid used to distend the uterine cavity is the most dangerous complication.

Glycine overload causes electrolyte imbalance (hyponatremia, hypoproteinemia and low hematocrit). Patients complain of nausea, vomiting, headache and confusion. Pulmonary and brain edema can take place. Fluid overload is also possible with isotonic saline but its effects are less serious than those with a glycine medium. Guidelines indicate that intravasation of 750 ml requires the planned termination of surgery. A balance exceeding 1000-2000 ml requires an immediate termination of the surgery [2].

Gas embolisms

Gas embolisms can occur with gas from the electrosurgery or with gas from the room air. With bipolar energy, the risk was supposed to be extremely low. However, one of the randomized trial shows that venous gas embolism (VGE) is frequent during hysteroscopic myoma resection. Gas embolism was equally observed irrespective of the type of diathermia. No intervention for cardiovascular instability was needed. More serious VGE were observed if intravasation exceeded 1000 ml.

Air embolism is a dangerous complication. Surgeons and anaesthetists should be aware of this and must know how to manage it [2, 6].

Adhesions

A 35-45% rate of post-operative adhesions was reported with monopolar energy, and 7.5% with bipolar energy. Many barrier methods have been attempted to avoid the formation of adhesions. Some of them have limited effectiveness (intrauterine device, hormonal therapy) while others appear to be promising (Foley catheter balloon and hyaluronic gel). The latter has to be evaluated in randomized controlled trials. A control diagnostic hysteroscopy is recommended between 6 and 8 weeks after the procedure to ensure the absence of postoperative adhesions (10% of cases) [2, 7].

Bleeding outcome

A success rate of 70-99% has been reported by different studies. Success rates seem to decline as the follow-up period increases because of either incomplete removal or an occurrence of other dysfunctional factors. Some predictors of failure have been identified in prospective studies (number of fibroids, fibroid size, uterine size and incomplete surgery). When there is no desire for pregnancy any more, a concomitant endometrial ablation resulted in amenorrhea in up to 95.5% of patients [2].

Fertility outcome

Submucosal fibroids have negative impact on pregnancy rates. Surgical resection by hysterescopy improves pregnancy rates in submucosal fibroids while myomectomy for intramural myoma is still debated. In submucous type 0 fibroids, Casini *et al.* reported an increase in pregnancy rates from 27 to 43% [2, 8].

Conclusions

Hysteroscopic resection of submucous myoma is an effective procedure. Bipolar resection should be preferred. Fertility outcome and menorragia are both enhanced by this procedure. However, for menorrhagia, a recurrence can occur mainly during the first year following the surgery.

Disclosure

Authors report no conflict of interest.

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