Clinical Analysis of 44 Cases of Atypical Polypoid Adenomyoma of the Uterus

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Research Article

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Abstract

Background: Atypical polypoid adenomyoma (APA) is a rare intrauterine polypoid lesion that occurs predominantly in premenopausal women. Although, it is considered as a benign lesion and treated conservatively previously, more and more cases show that APA has a high rate of recurrence or residual, and is found to precede the development of carcinoma. The clinical management of APA remains to be established. The aim of this study was to analyse the clinicopathological features of APA and discuss its diagnosis and prognosis.

Methods: Forty-four patients with APA were admitted to Beijing Obstetrics and Gynecology Hospital from 2005-2019, and their clinical and histopathologic features were evaluated. B-ultrasound was performed, and all patients (n=44) underwent hysteroscopy. Endometrium excision was performed by means of the “Four-step diagnosis and treatment” method. Hysteroscopic transcervical resection (TCR) was performed in 5 cases with APA-H and 11 with APA-L. Except for one patient who underwent transcervical endometrial resection, all patients underwent hysterectomy and salpingectomy or salpingo-oophorectomy. Data from a median follow-up of 42 months (ranging from 3 to 174 months) were available for these patients.

Results: Pathological diagnoses were made according to the degree of abnormality of APA surface glands, resulting in APA-L in 36 cases and APA-H in 8 cases. Among these cases, 28 (25 APA-L and 3 APA-H) were treated conservatively. “Four-step diagnosis and treatment” method performed a excellent effect for APA therapy. During the follow-up no evidence of recurrence was found.

Conclusions: For cases with intracavitary lesions > 1 cm, hysteroscopic “four-step diagnosis and treatment” and pathological diagnosis are the basis of clinical treatment. More than 30% of APA surface glands have complex structures, characterized by branching and budding, or other high-risk factors, such as endometrial hyperplasia, which are indications for hysterectomy. For patients with the desire to become pregnant or for uterine preservation, hysteroscopy with complete excision of the lesions should be the preferred treatment method. The patients should be treated individually, followed up closely, and followed up by regular hysteroscopy and endometrial biopsy.

Introduction

Many common gynaecologic conditions, such as endometriosis or endometrial polyps, are associated with infertility[1, 2]. Atypical polypoid adenomyoma (APA) is a rare intrauterine space-occupying lesion composed of atypical endometrial glands surrounded by smooth muscle tissue bundles[3]. The term APA was first put forward by Mazur in 1981. Five types of polypoid lesions in premenopausal women, which were characterized by atypical glands with squamous metaplasia and smooth muscle intercellular stroma, were previously described[4].

APA is a rare and benign uterine tumour, and it is difficult to evaluate its incidence[5]. Most cases are reproductive-aged women, but some studies have reported APAs is postmenopausal women[6]. Abnormal uterine bleeding, anaemia and infertility are the main clinical symptoms of APA[7]. Preoperative

examinations, including B-ultrasound, CT and MRI, can be used to preliminarily evaluate the condition of the uterus, and hysteroscopy technology allows comprehensive assessments of endometrial lesions with the naked eye. However, the naked eye cannot precisely discriminate APA from endometrial polyps. Consequently, histological examination for the pathological diagnosis of APA is still the diagnostic standard[8, 9]].

The size of the tumor diameter varies from 0.1 to 6 cm, with 12 cm being the largest recorded tumor. Usually, the lesion arises in the lower uterine segments, sometimes in the uterus fundus or endocervical canal, but also has been reported to involve the oviduct in monkeys. Histologically, APA consists of biphasic proliferation of atypical endometrial glands with squamous morular differentiation and abundant stroma with smooth muscles and fibrous tissue. The myofibromatous stromal tissue derives from the myofibromatous metaplasia of endometrial stromal cells. Others believe that prolonged estrogenic stimulation may be significant. In addition, Longacre et al. proposed that if the lesions of APA exhibit markedly complex glands and severe architectural complexity, these PAPs should be designated as " APA of low malignant potential (APA-LMP)", emphasizing the potential risk relating to malignant potential. Findings from previous immunohistochemical studies reveal that the stromal components of PAP are positive for a-smooth muscle actin (a-SMA), estrogen receptor (ER), progesterone receptor (PR), P53, Ki-67, CD34 and desmin, whereas CD10 and h-caldesmon were negative or weakly positive.

However, there is currently no gold standard for the clinical treatment of APA patients. Medication and surgery are the main treatment modalities for patients with APA[10], and fertility preservation treatment is performed in women of childbearing age who wish to become pregnant. Patients treated with conservative therapy have a high rate of relapse and endometrial adenocarcinoma[11–13]. Once the patient is diagnosed with APA, a long-term follow-up study becomes necessary. This study retrospectively investigated the clinical characteristics, treatment and prognosis of APA to provide suggestions for the diagnosis and treatment of APA.

Methods And Materials

Study population

We collected clinical information and pathology specimens from 44 patients with APA who had been diagnosed and treated at the gynaecological minimally invasive centre of Beijing Obstetrics and Gynaecology Hospital between 2005 and 2019. Clinical manifestations in this group were as follows. (1) A total of 35 cases had abnormal uterine bleeding, with 26 cases having menstrual changes and 9 cases having postmenopausal bleeding. Among the 26 patients with menstrual changes, there were 10 cases of menstrual disorder, 8 cases of prolonged menstruation, 4 cases of increased menstrual volume and 4 cases of intermenstrual bleeding. (2) Among the 44 cases, there were 8 cases with no obvious clinical symptoms but an abnormal echo or heterogeneous thickening of the endometrium by B-ultrasound examination. (3) Among the 44 cases, there were 7 cases of infertility. (4) Additionally, there were 2 cases of dysmenorrhoea, 2 cases of vaginal fluid and 2 cases of hypogastralgia. There were no obvious

differences among the gynaecological examinations. B-ultrasound examinations showed an abnormal echo in the uterine cavity or cervical canal in 25 cases, endometrial thickening or an abnormal intrauterine echo in 17 cases, and no obvious abnormality in 2 cases. Twenty-one patients had blood flow signals such as star like blood flow or ri0.32–0.47 on B-ultrasound. This patient group did have clinical complications. There were 6 cases with APA combined with hysteroscopic endometrial polyp or cervical polypectomy, 8 cases with APA combined with hysteromyoma, 1 case of APA combined with benign ovarian tumour, 10 cases of APA combined with abnormal uterine bleeding-ovulation disorder, 10 cases of APA combined with hypertension, 4 cases of APA combined with diabetes, 2 cases of APA combined with hyperthyroidism, and 1 case of APA who had taken toremifene citrate for 5 years after breast cancer surgery. (Table 1).

Table 1
Patient information

No.	Age	BMI	CA125	Menopausal status	AUB	Infertility	Ultrasound finding	Haemoglobin
1	28	31.94	36.1	premenopausal	No	No	endometrial thickening	134
2	33	28.24	30.5	premenopausal	No	No	endometrial thickening	144
3	35	31.15	68.5	premenopausal	Yes	No	normal	122
4	28	31.31	60.7	premenopausal	Yes	No	endometrial thickening	151
5	40	34.91	17.2	premenopausal	Yes	Yes	abnormal	111
6	30	31.31	41.8	premenopausal	Yes	No	abnormal	142
7	36	24.05	64.2	premenopausal	Yes	Yes	endometrial thickening	115
8	39	27.42	54.8	premenopausal	Yes	No	endometrial thickening	116
9	47	25.84	9.3	premenopausal	Yes	No	endometrial thickening	134
10	53	23.48	37.3	premenopausal	No	No	abnormal	113
11	33	22.32	5.6	premenopausal	No	Yes	endometrial thickening	122
12	39	23.62	18.9	premenopausal	Yes	No	abnormal	140
13	48	29.43	39.8	premenopausal	Yes	No	endometrial thickening	145
14	58	34.11	41.3	premenopausal	Yes	Yes	endometrial thickening	133
15	73	22.68	6.9	postmenopausal	Yes	No	endometrial thickening	127
16	35	22.11	35.3	premenopausal	No	Yes	endometrial thickening	151
17	36	30.58	53.4	premenopausal	yes	Yes	abnormal	141
18	41	25.78	40.5	premenopausal	Yes	No	endometrial thickening	113
19	47	22.28	36.4	premenopausal	Yes	No	endometrial thickening	128
20	54	31.98	18.7	premenopausal	Yes	No	endometrial thickening	96

No.	Age	BMI	CA125	Menopausal status	AUB	Infertility	Ultrasound finding	Haemoglobin
21	38	32.98	16.7	premenopausal	No	No	endometrial thickening	134
22	43	33.09	45.7	premenopausal	Yes	No	abnormal	112
23	47	25.51	36.7	premenopausal	Yes	No	abnormal	139
24	49	22.1	55.6	premenopausal	Yes	No	abnormal	124
25	57	32.24	11.9	premenopausal	No	No	endometrial thickening	141
26	73	30.63	34	postmenopausal	Yes	No	abnormal	132
27	74	29.75	12.1	postmenopausal	Yes	No	endometrial thickening	141
28	39	29.13	26.7	premenopausal	Yes	Yes	endometrial thickening	106
29	62	30.17	38.4	postmenopausal	No	No	endometrial thickening	147
30	70	24.1	33.7	postmenopausal	No	No	endometrial thickening	118
31	59	30.66	19.2	premenopausal	Yes	Yes	endometrial thickening	121
32	61	24.88	69.7	premenopausal	Yes	No	abnormal	111
33	69	24.8	68	postmenopausal	Yes	No	endometrial thickening	121
34	61	32.34	56.6	premenopausal	No	Yes	abnormal	90
35	63	33.57	4.3	postmenopausal	Yes	No	abnormal	121
36	66	25.97	12.2	postmenopausal	No	No	abnormal	140
37	73	22.63	63.6	postmenopausal	Yes	No	endometrial thickening	108
38	42	29.44	8	premenopausal	Yes	No	abnormal	113
39	47	23.98	14.4	premenopausal	Yes	No	abnormal	127
40	53	25.16	5.5	premenopausal	Yes	Yes	abnormal	132
41	61	23.29	12.6	premenopausal	Yes	Yes	endometrial thickening	142
42	61	26.92	28.2	postmenopausal	Yes	No	normal	167

No.	Age	BMI	CA125	Menopausal status	AUB	Infertility	Ultrasound finding	Haemoglobin
43	73	25.93	26.9	postmenopausal	No	No	endometrial thickening	132
44	73	25.5	26.7	postmenopausal	Yes	No	abnormal	119

Four-step diagnosis and treatment

All patients underwent hysteroscopy and resection of uterine cavity-occupying lesions. “Four-step diagnosis and treatment” was used in the endometrium excision. The specific procedures were as follows: (1) complete excision of occupying lesions from the root; (2) resection of endometrial tissue around the root (ranging from 0.2 to 0.5 cm); (3) removal of 0.3 cm of myometrial tissue below the root; and (4) hysteroscopy and multipoint biopsy of the remaining endometrium. All resected tissues need to be submitted for pathological diagnosis, which is the basis of clinical treatment.

Results

Hysteroscopic findings

All of 44 cases underwent hysteroscopy. A single lesion was found in 40 cases (90.9%), and the mean size was 2.83±0.73 cm (ranging from 0.5 to 6 cm). The specific distribution was follows: there were 10 cases of uterine cavity bottom, 8 cases of anterior wall, 7 cases of left uterine angle, 5 cases of right uterine angle, 5 cases of posterior wall, 2 cases of right anterior wall, 1 case of right wall, 1 case of right anterior near cervical intraoral, and 1 case of left wall. There were 8 cases with rich blood vessels on the lesion surface and 2 cases with atypical vessels, which typical hysteroscopic morphology (Fig. 1). In addition, there were 4 cases with multiple lesions.

Pathological diagnosis

APA was diagnosed pathologically after hysteroscopic resection of the lesion. (Fig. 2). According to the degree of abnormality of the APA surface glands, APA was classified as APA-L or APA-H[11]. More than 30% of APA surface glands have complex structures, characterized by branching and budding(Fig. 2),in which dense glands were co-existing with branched glandular duct structure.There were 36 cases of APA-L and 8 cases of APA-H. Hysteroscopic biopsy of the endometrium in other parts of the uterine cavity revealed mild or moderate atypical hyperplasia in 7 cases.

APA association with medication

Twenty-eight patients aged from 27 to 42 years with the desire for uterine preservation, including 15 patients who attempted to conceive, were treated conservatively. Three cases with APA-H and two cases with APA-L combined with mild atypical hyperplasia of the endometrium were treated with

medroxyprogesterone acetate (500 mg/day). After 3–6 months of drug treatment, hysteroscopy and multipoint endometrial biopsy were performed. When the endometrial pathological diagnosis became associated with the effect of progesterone treatment, such as the development of partial glands in the endometrium during the secretory phase or atrophy during the proliferative phase, the high-performance progestogen administration was stopped. Patients began taking medroxyprogesterone on the 14th day of menstruation (20 mg/day) for 12 days. After 3 months of medication, hysteroscopy and endometrial biopsy were performed, and no abnormal changes in the endometrium were found.

The drug treatment for 23 cases with APA-L was as follows: 8 cases were treated with high-performance progestogen, 6 cases were given medroxyprogesterone or progesterone in the second half of the menstrual cycle, 4 cases were on short-acting oral contraceptives and 5 cases were followed up regularly without medication. Hysteroscopy and endometrial biopsy were performed every 3 to 6 months to evaluate the histological changes in the endometrium. If the endometrium was normal with two consecutive endometrial biopsies, then regular hysteroscopy and endometrial biopsy were no longer needed. In addition, menstruation and transvaginal ultrasound were performed to look for abnormal growth of the endometriumshowed characteristic B-ultrasound appearance of APA(Fig. 3).

APA association with surgery

In total, 16 cases received surgery. One patient underwent transcervical endometrial resection because hysteroscopic biopsy showed complex endometrial hyperplasia. Fifteen patients with total hysterectomy and salpingectomy or salpingo-oophorectomy were 44 to 74 years old with no desire for uterus preservation and conceiving. Among those who underwent endometrial biopsy, 5 patients had APA-H, 5 patients had mild or moderate atypical hyperplasia of the endometrium, and 4 patients had uterine leiomyoma or abnormal uterine bleeding. After total hysterectomy, endometrial pathological diagnosis indicated 4 cases with mild atypical hyperplasia, 1 case with mild or moderate atypical hyperplasia, and 11 cases with benign endometrial tissues.

APA association with follow-up

Patients were followed up for 6–174 (62.5±45.3) months, and there was no recurrence among patients who received conservative treatment. (1) Among 15 cases who had a desire to give birth, 3 cases with ovulation disorders gave up on attempts to conceive after assisted reproduction technology failure. However, 12 cases became pregnant after hysteroscopic resection of their uterine cavity-occupying lesions, including 7 cases with spontaneous conception and 5 cases with increased odds of a successful pregnancy by ovulation induction or assisted reproductive technology. (2) Seven patients with abnormal uterine bleeding and ovulatory dysfunction experienced abnormal menstruation. Among them, 3 cases received progestin treatment in the second half of the menstrual cycle, 3 cases underwent an insertion of the levonorgestrel-releasing intrauterine system, and 1 patient who was followed up for 52 months after hysteroscopic conservative surgery had post-hysteroscopy and endometrial biopsy pathology results that revealed mild atypical hyperplasia of the endometrium, leading to total laparoscopic hysterectomy and salpingectomy.

Discussion

The incidence of APA is low, and the cause of the disease is currently unclear. It has been reported that the age of onset of APA is 18 to 81 years[11] and that APA occurs mostly in premenopausal women[14]. Patients in this group were 27 to 74 years old (mean age, 45.1±13.7 years), among whom 32 cases (72.7%) were premenopausal and 12 cases (27.3%) were postmenopausal. The most common clinical manifestation was abnormal uterine bleeding (35/44). The second most common characteristic of the patients in our group was the B-ultrasound finding of no obvious symptoms in terms of an intrauterine echo (8/44). Other clinical complications, including infertility (7/44), AUB-O (10/44) and diabetes (4/44), were found in this group. It is worth noting that one patient received toremifene citrate after breast cancer surgery for 5 years. There were 7 cases with mild or moderate atypical hyperplasia, considering that the occurrence of APA is related to continuous oestrogen stimulation.

Patients with APA do not have typical specific clinical manifestations. The most common symptom is abnormal uterine bleeding[15]. B-ultrasound can indicate heterogeneous endometrial thickening, abnormal intrauterine echoes, and blood flow changes without specificity. Therefore, it is necessary to differentiate APA from endometrial polyps, endometrial cancer, adenomyosis, uterine adenofibroma and malignant mixed Mullerian tumours. APA can be combined with endometrial precancerous lesions and endometrial cancer[16]. Therefore, hysteroscopy must be performed for patients with clear indications such as abnormal uterine bleeding, abnormal intrauterine echo and infertility. During hysteroscopy, endometrial thickness, texture, vascular morphology, intrauterine lesions, size, location, texture and surface vascular characteristics of the lesions should be carefully evaluated. The reliability of hysteroscopy in diagnosing focal intrauterine lesions even in precancerous cases has been shown in many previous studies. We also found that hysteroscopy plays an important role in the identification of lesions of APA.

Among the patients in this group, 40 had single lesions. The diameters of the lesions were 0.5 to 6 cm, with the average diameter being 2.83±0.73 cm, which was consistent with the literature[17]. APA does not have a unique appearance under hysteroscopy, and it is often confused with endometrial polyps or submucosal fibroids. However, the diameter of APA is larger than 1 cm in most cases, with the surface consisting of abundant and thick blood vessels. Therefore, during surgery, uterine space-occupying lesions with diameters greater than 1 cm should be completely resected according to the “four-step diagnosis and treatment” method. Additionally, corresponding biopsies of the endometrium and superficial muscular layer at the base and its surrounding area should be performed. It is indispensable to follow-up the pathological diagnosis to decrease the possibility of a misdiagnosis.

Wong et al. found that progesterone may have a protective effect in APA patients during pregnancy[18]. Chen et al. demonstrated that APA patients who desired to give birth and were treated with progestin had no recurrence after undergoing hysteroscopic resection of the lesion[19]. Zhang et al[20]. revealed that the “four-step diagnosis and treatment” method is the most effective treatment for APA patients, as it completely reduces the recurrence rate. However, other research has indicated that the recurrence rates of APA in patients range from 28.9–35.1%[14, 16, 21], as deeper invasion into the uterine muscle is easily

induced. A multicentre study revealed that the malignant transformation rate of APA is up to 0.8%, which is much higher than that of endometrial polyps[22].

Therefore, APA treatments can be individualized according to age, fertility requirements and postoperative pathological diagnosis. Total hysterectomy is recommended for menopausal or perimenopausal patients with APA-H. Additionally, in determining precise treatments for patients with APA-L, physicians need to consider the patient's age and desire to become pregnant or preserve the uterus. High-efficiency progesterone therapy is recommended for patients of childbearing age with APA-H. Moreover, patients of childbearing age with APA-L should undergo regular follow-up. In this study, patients with APA-H or APA-L combined with atypical hyperplasia of the endometrium were treated with high-efficiency progesterone. Patients with APA-L were treated with progestin in the second half of the menstrual cycle and with short-acting oral contraceptives and then followed up regularly without medication so that there would be no recurrence in this group. Regular postoperative follow-up measures were applied against APA. Patients with APA-H or atypical hyperplasia of the endometrium tend to undergo uterine preservation or give birth, so this group should receive regular and close follow-up. Hysteroscopy and endometrial biopsy are the basis of treatment schemes and decrease the misdiagnosis rate of endometrial diseases. A recent metanalysis indicate that the best treatment for APA is hysteroscopy, as you correctly mention. Medications in particular progestogens are not a treatment but eventually a prevention of recurrence of APA. The metanalysis clearly shows that progestogens are useless for this [23].

Forty-four patients were confirmed to have no recurrence by regular hysteroscopy and endometrial biopsy during follow-up. There are many reasons for this outcome. First, complete resection of the lesion according to the principles of the "four-step diagnosis and treatment" method is the main treatment for APA patients, as this reduces the rate of misdiagnosis and provides an effective foundation for clinical treatments. Second, follow-up is of great significance for patients with conservative treatments. B-ultrasound, hysteroscopy and endometrial biopsy were combined during follow-up to avoid false negatives and improve the accuracy of endometrial biopsy. One patient in this group was found to have mild atypical hyperplasia of the endometrium by hysteroscopy and endometrial biopsy during follow-up. Surgery was performed in this patient to avoid malignant transformation of the endometrium. Finally, continuous stimulation with oestrogen and a lack of progesterone are the main pathological mechanisms of APA. Therefore, a levonorgestrel-releasing intrauterine device is the first choice for the treatment of APA patients with abnormal uterine bleeding and ovulatory dysfunction. In addition, these patients need long-term clinical management.

The differential diagnosis includes benign endometrial polyps, adenofibroma, adenosarcoma, complex atypical endometrial hyperplasia (CAH), malignant endometrial mixed tumor (MMMT) and EC1 [24]. In some cases, it is also difficult to distinguish APA from cervical polyp when the lesions protrude from the cervix into the vagina. APA occurs in young, nulliparous and premenopausal women and the sectioned surface is solid, polypoid, firm, rubbery or lobulated, whereas adenofibroma, adenosarcoma, MMMT and EC typically occur in postmenopausal women with large exophytic mass or endogenous infiltrative lesions. In contrast to the increased cellularity, cytological atypia and short interlacing fascicles of stroma

in APA, typical endometrial polyps and adenomyomas comprise benign endometrial glands, myomatous stroma and a minor of component of fibrous tissue. Squamous metaplasia occurs in more than 90% cases of APA while it is uncommon in other benign lesions, so, squamous metaplasia is another useful marker for the differential diagnosis.

It has been confirmed that 2 to 5 years after surgical treatment is the peak time of APA recurrence among patients[25, 26]. To avoid APA relapse, close follow-up should be conducted within 5 years. Hysteroscopy and endometrial biopsy were performed within 3 to 6 months after treatments. If endometrial abnormalities are not diagnosed during two consecutive examinations and if the patient has fertility requirements, is of reproductive age and does not have any infertility factors, it is recommended that the patient actively attempt natural conception or conception by assisted reproductive technology. Therefore, the patient should be followed up by regular B-ultrasound examinations to monitor changes in the endometrium. Moreover, once the patient develops abnormal uterine bleeding, an abnormal intrauterine echo and other symptoms, she needs to undergo both hysteroscopy and endometrial biopsy to obtain evidence of endometrial abnormalities. On the other hand, if precancerous endometrial lesions or endometrial cancer are found during two consecutive examinations, the effective treatment plans should be further determined according to age, pathological diagnosis and fertility requirements.

However, there are still some limitations in our study. This is a retrospective study. The sample size of patients was small, and conservative treatment was not unified. A large sample size is required for observation and verification of conservative treatment and follow-up of APA patients.

Conclusions

For cases with intracavitary lesions > 1 cm, hysteroscopic "four-step diagnosis and treatment" and pathological diagnosis are the basis of clinical treatment. More than 30% of APA surface glands have complex structures, characterized by branching and budding, or other high-risk factors, such as endometrial hyperplasia, which are indications for hysterectomy. For patients with the desire to become pregnant or preserve the uterus, hysteroscopy with complete excision of the lesions should be the preferred treatment method. The patients should be treated individually and undergo close follow-up, and they should be followed up by regular hysteroscopy and endometrial biopsy.

Abbreviations

APA: Atypical polypoid adenomyoma; AUB-O: Abnormal uterine bleeding due to ovulatory dysfunction; BMI: Body mass index.

Declarations

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Not applicable

Author contributions

Research design: XW. Acquisition of data: XW, YShG. Interpretation of data: YSh G. All authors read and approved the final manuscript.

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Availability of data and materials

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

The Ethics Committee of The Beijing Obstetrics and Gynecology Hospital of Capital Medical University approved the study protocol(No.IEC-B-03-V01-FJ1), which was performed in compliance with the Helsinki Declaration. Written informed consent was obtained from all of the patients.

Consent for publication

Not applicable

Competing interests

The authors declare that they have no competing interests.

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Figures

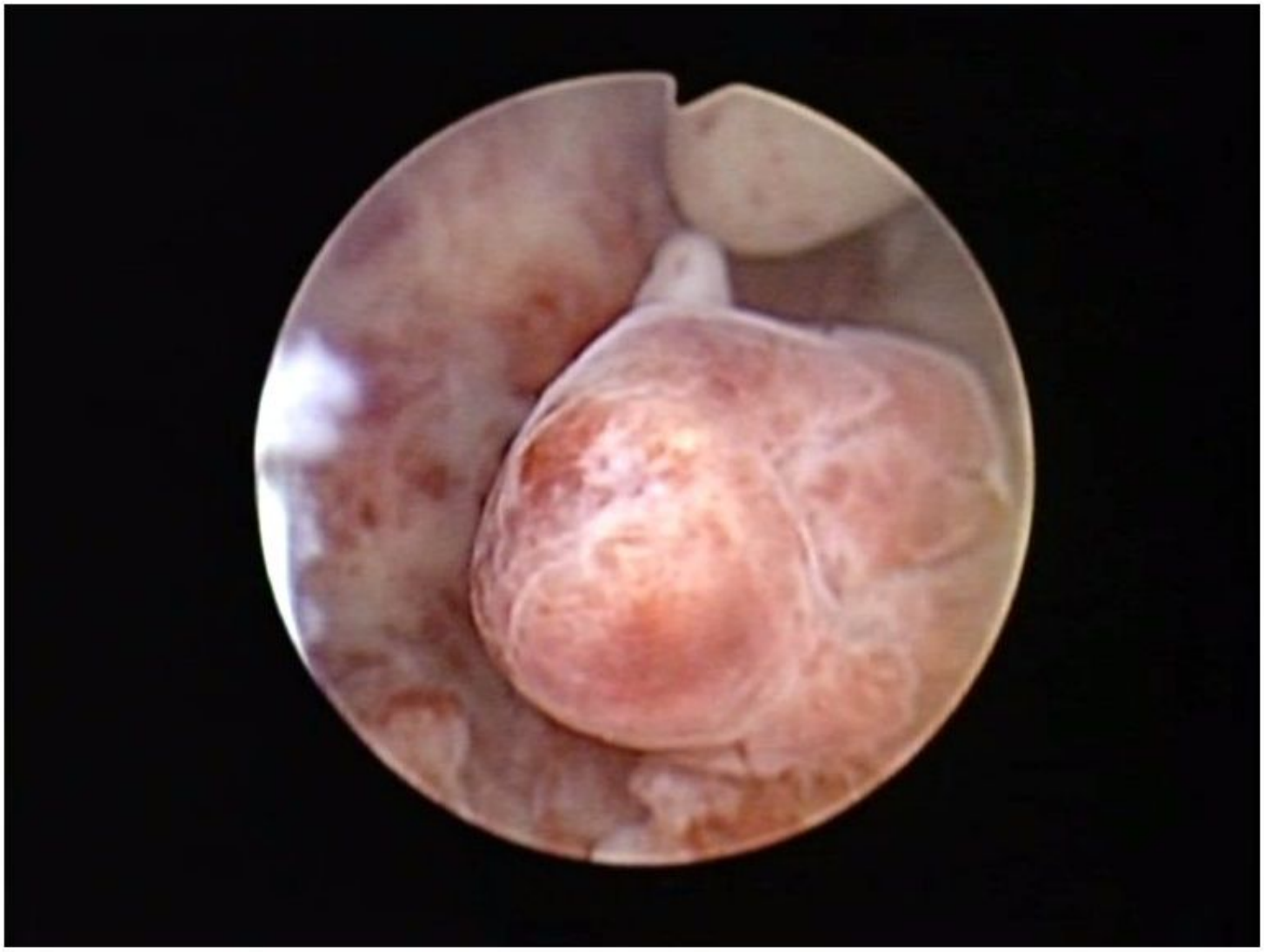

Figure 1

Atypical polypoid adenomyoma seen on hysteroscopy (lesions located in the posterior wall of the uterine cavity, diameter 2.0 cm, irregular shape)

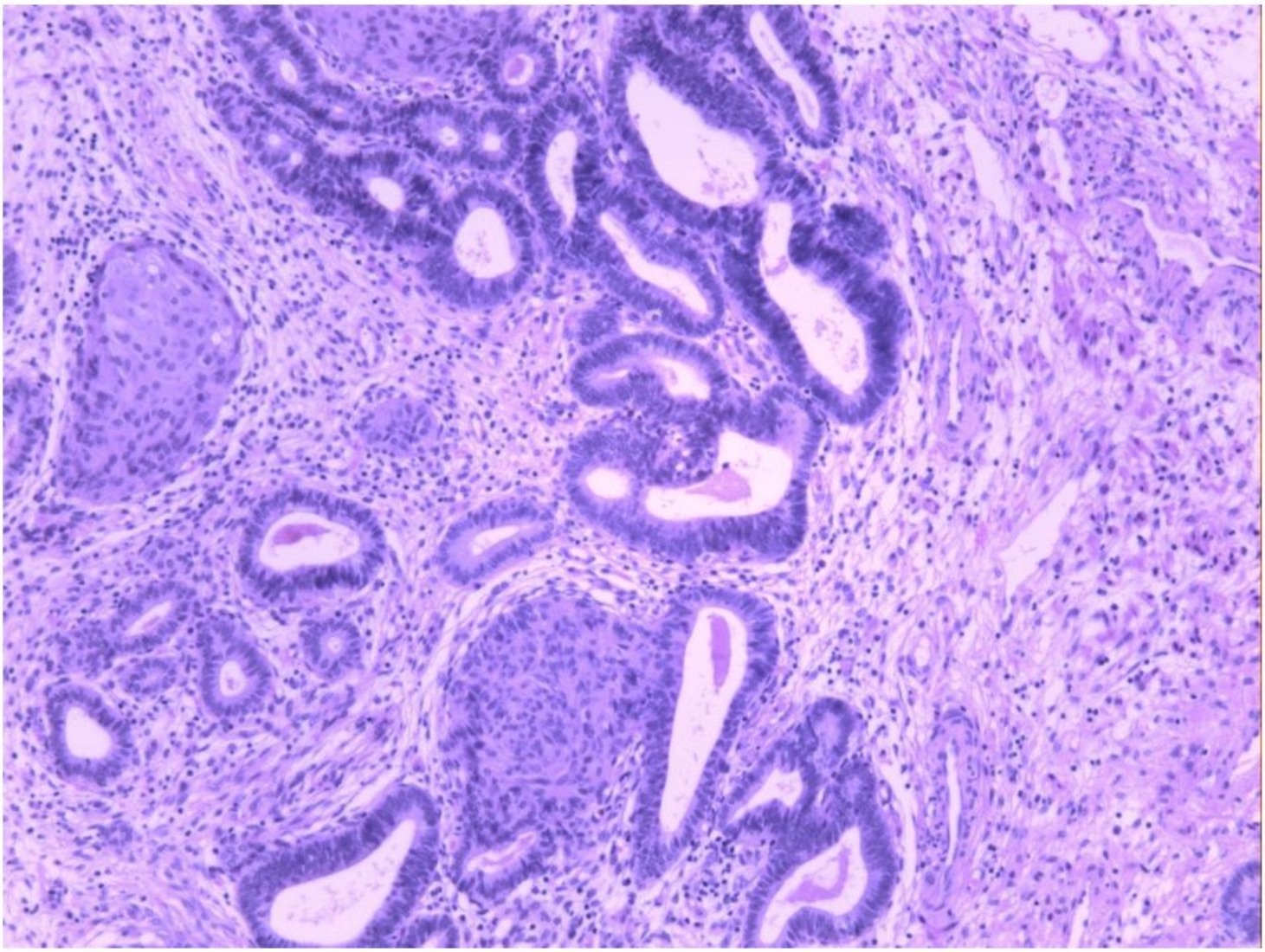

Figure 2

Representative microscopic appearance of atypical polypoid adenomyoma (H&E stain).

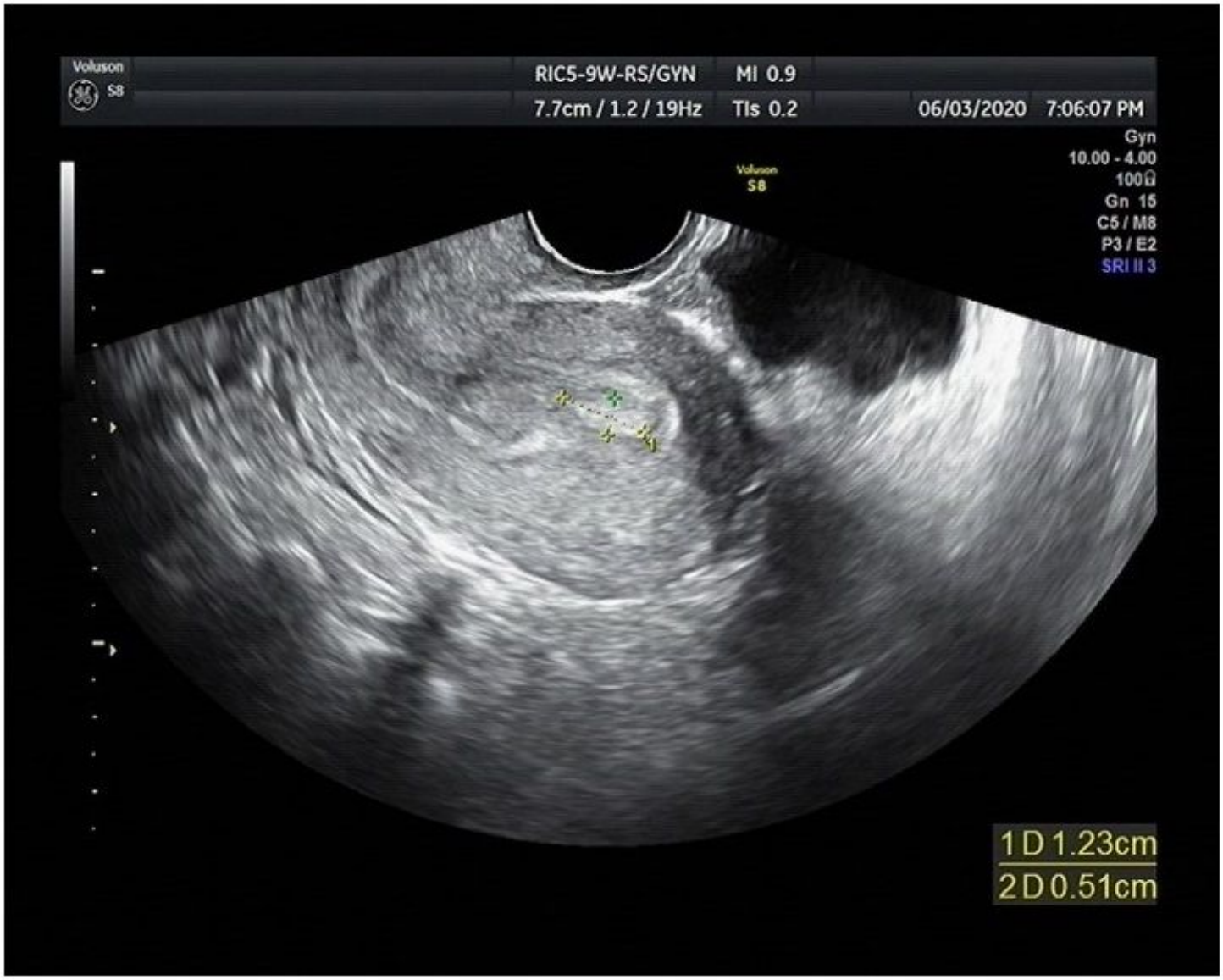

Figure 3

Atypical polypoid adenomyoma was seen by B-ultrasound (endometrium 1.0 cm, intrauterine hyperechoic mass 1.7*1.2 cm)