

Surgical strategies in uterine adenomyosis

Nicolae Bacalbasa^{1,2}, Irina Balescu³, Roxana Elena Bohiltea^{1,4}, Valentin Varlas^{1,4}, Lucian Pop⁵,
Claudia Stoica^{6,7}, Cristina Martac⁸, Alexandru Filipescu^{1,9}, Adnan Ad Aloul^{10,11}

¹Department of Obstetrics and Gynecology, "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania

²Department of Visceral Surgery, Center of Excellence in Translational Medicine, Fundeni Clinical Institute, Bucharest, Romania

³Department of Visceral Surgery, Ponderas Academic Hospital, Bucharest, Romania

⁴Department of Obstetrics and Gynecology, Filantropia Clinical Hospital, Bucharest, Romania

⁵Department of Obstetrics and Gynecology, "Alessandrescu-Rusescu" National Institute of Mother and Child Care, Bucharest, Romania

⁶Department of Anatomy, "Carol Davila" University of Medicine and Pharmacy, Bucharest, Romania

⁷Department of Surgery, Ilfov County Emergency Hospital, Bucharest, Romania

⁸Department of Anesthesiology, Fundeni Clinical Institute, Bucharest, Romania

⁹Department of Obstetrics and Gynecology, Elias Emergency Hospital, Bucharest, Romania

¹⁰Department of Surgery, Ramnicu Sarat County Hospital, Buzau, Romania

¹¹Department of Surgery, "Titu Maiorescu" University, Bucharest, Romania

ABSTRACT

Uterine adenomyosis is defined by the presence of heterotopic endometrial glands and stroma at the myometrial level. Although imagistic studies improved, the incidence of adenomyosis is still underestimated, in a significant number of cases the final diagnostic of adenomyosis being established on the histopathological specimen of hysterectomy. The aim of the current paper is to discuss about the most efficient therapeutic strategies in adenomyosis.

Keywords: adenomyosis, hysterectomy, surgery

INTRODUCTION

Defined as the presence of ectopic endometrium and stroma at the level of the myometrial layer, adenomyosis can remain asymptomatic for a long period of time or might be associated with unspecific symptoms such as debilitating pain pelvic at the time of the menstrual periods and infertility. Oppositely to endometriosis – which is present usually in young women – being diagnosed in the second and third decades of life -, adenomyosis is usually diagnosed in the fourth and fifth decades of life while the etiopathogenesis is not clearly known (1). However, two pathogenic theories have been incriminated: the first one refers to the invagination of the endometrial layer while the second one takes

into consideration the possibility of metaplasia of the embryonic stem cells (2). These mechanisms in association with other risk factors such as age, parity, previous uterine surgery, smoking, ectopic pregnancy or tamoxifen therapies seem to be responsible for the development of adenomyosis (3).

DIAGNOSIS

Due to the fact that most often this entity, remains asymptomatic for a long period of time, a preoperative diagnostic can be hard to be established. However, the presence of hard menstrual periods dyspareunia and fertility dysfunctions might orientate the diagnostic (4,5). In such cases the development of ultrasound and magnetic resonance

Corresponding author:
Irina Balescu
E-mail: irina.balescu@ponderas-ah.ro

Article History:
Received: 4 December 2021
Accepted: 30 December 2021

imaging led to an improvement of the diagnostic rate in these cases and therefore, the final diagnostic could be established more easily during the preoperative period and less extended surgical procedures could be taken in consideration (6,7).

THERAPEUTIC STRATEGIES

Whenever the diagnostic of endometriosis is suspected the conservative, medical treatment should be taken in consideration. The main therapeutic agents which have been proposed were represented by anti-inflammatory drugs, aromatase inhibitors or selective progesterone receptor modulators (8-10). These agents offer an efficient alleviation of the symptoms when administrated but most often they do not treat the cause, therefore the symptoms will reappear at a certain moment of the disease. Meanwhile, severe side effects such as embolism might occur in certain cases (11). Therefore, attention was focused on identifying conservative surgical strategies which are able to remove the cause and which do not predispose the patient to further development of severe complications. Another significant desiderate which should be taken in consideration when talking about surgery in adenomyosis is related to the preservation of fertility. Therefore, at this moment the most widely investigated methods are represented by local excision of the adenomyotic lesions through high intensity focused ultrasound, hysteroscopy or through laparoscopy – in cases presenting limited, nodular lesions and uterine artery embolization in cases presenting diffuse lesions, as an alternative for hysterectomy; meanwhile, cases presenting extended, diffuse lesions which are associated with intractable symptoms and which do not deserve further fertility preservation will be further submitted to hysterectomy; however, the method is nowadays reserved for cases in which all the other therapeutic strategies have failed (12-16).

Hysteroscopic ablation represents one of the least invasive surgical approaches consisting of the resection of the nodular lesions by using thermal balloon ablation, yttrium aluminium garnet, microwave ablation or radiofrequency ablation followed by electrocoagulation (17). The method is a very comfortable one for the patient; however, it should be reserved for cases presenting limited, nodular lesions.

High-intensity focused ultrasound (HIFU) is another minimally invasive procedure which might be performed in patients with nodular areas of endometriosis; the principle of the method consists of delivering intense ultrasound energy at the level of

the abnormal tissues, their vascularization being destroyed through the cavitation effect. The method is usually performed under magnetic resonance imaging or ultrasound guidance; more recently, the effectiveness of HIFU was improved by the association of local administration of non-hormonal agents such as metformin or hormonal agents (such as gonadotropin releasing hormone) (18,19).

The idea of using uterine artery embolization in patients with adenomyosis was borrowed from cases diagnosed with uterine fibroids. The method consists of an arterial approach through the femoral or radial artery followed by a selective angiography of the internal iliac artery and embolization of different types of particles at the level of the uterine arteries. Therefore, local devascularisation is induced, therefore diminishing the vascular supply of the adenomyosis islands. The method proved to be efficient in treating uterine adenomyosis but might also induce the development of other complications, the most dangerous one being represented by uterine necrosis. Meanwhile, the overall diminishing of the vascularization might also affect the normal areas of the endometrial lining, issues of fertility being reported during the long term outcomes (20,21).

As expected, maybe the most effective and safe method in order to treat adenomyosis remains the surgical approach consisting of limited local resection. The method of minimally invasive resection was initially reported in 2004 and was submitted to continuous improvement (22-24). Nowadays the method consists of uterine section under direct laparoscopic visualization, identification through visualization and palpation of the adenomyosis islands, their removal and two or even three layers suture of the uterine wall in order to prevent uterine rupture if pregnancy occurs (22,23). Therefore, in the study conducted by Kwack et al. and published in 2017 the authors included 105 patients submitted to this therapeutic approach the authors demonstrated that the symptoms were significantly diminished in 93% of cases while the recurrence rate was of 10% (24).

CONCLUSIONS

Adenomyosis represents a pathological condition which can be associated with diffuse pelvic pain, fertility issues, dyspareunia and heavy periods. In order to preserve fertility and to offer a good control of the symptoms different therapeutic strategies have been proposed, minimally invasive procedures of resection and reconstruction being nowadays associated with the best long term outcomes.

Conflict of interest: none declared
Financial support: none declared

REFERENCES

1. Farquhar C, Brosens I. Medical and surgical management of adenomyosis. *Best Practice & Research Clinical Obstetrics & Gynaecology*. 2006;20(4):603-616.
2. García-Solares J, Donnez J, Donnez O, Dolmans MM. Pathogenesis of uterine adenomyosis: invagination or metaplasia? *Fertil Steril*. 2018;109:371-379.
3. Taran FA, Stewart EA, Brucker S. Adenomyosis: epidemiology, risk factors, clinical phenotype and surgical and interventional alternatives to hysterectomy. *Geburtshilfe Frauenheilkd*. 2013;73:924-931.
4. Struble J, Reid S, Bedaiwy MA. Adenomyosis: a clinical review of a challenging gynecologic condition. *J Minim Invasive Gynecol*. 2016;23:164-185.
5. Peric H, Fraser IS. The symptomatology of adenomyosis. *Best Pract Res Clin Obstet Gynaecol*. 2006;32:547-555.
6. Dueholm M, Lundorf E, Hansen ES, Sørensen JS, Ledertoug S, Olesen F. Magnetic resonance imaging and transvaginal ultrasonography for the diagnosis of adenomyosis. *Fertil Steril*. 2001;76:588-594.
7. Champaneria R, Abedin P, Daniels J, Balogun M, Khan KS. Ultrasound scan and magnetic resonance imaging for the diagnosis of adenomyosis: systematic review comparing test accuracy. *Acta Obs Gynecol Scand*. 2010;89:1374-1384.
8. Vannuccini S, Luisi S, Tosti C, Sorbi F, Petraglia F. Role of medical therapy in the management of uterine adenomyosis. *Fertil Steril*. 2018;109:398-405.
9. Badawy AM, Elnashar AM, Mosbah AA. Aromatase inhibitors or gonadotropin-releasing hormone agonists for the management of uterine adenomyosis: a randomized controlled trial. *Acta Obstet Gynecol Scand*. 2012;91:489-495.
10. Osada H. Uterine adenomyosis and adenomyoma: the surgical approach. *Fertil Steril*. 2018;109:406-417.
11. Dessouky R, Gamil SA, Gamal Nada M, Mousa R, Libda Y. Management of uterine adenomyosis: current trends and uterine artery embolization as a potential alternative to hysterectomy. *Insights into Imaging*. 2019;10:48.
12. Saremi A, Bahrami H, Salehian P, Hakak N, Pooladi A, Bahrami H. Treatment of adenomyomectomy in women with severe uterine adenomyosis using a novel technique. *Reprod BioMed Online*. 2014;28:753-760.
13. Vannuccini S, Petraglia F. Recent advances in understanding and managing adenomyosis. *F1000Research*. 2019;8:283.
14. Kim KA, Yoon SW, Lee C, Seong SJ, Yoon BS, Park H. Short-term results of magnetic resonance imaging-guided focused ultrasound surgery for patients with adenomyosis: symptomatic relief and pain reduction. *Fertil Steril*. 2011;95:1152-1155.
15. Resnick NJ, Kim E, Patel RS, Lookstein RA, Nowakowski FS, Fischman AM. Uterine artery embolization using a transradial approach: initial experience and technique. *J Vasc Interv Radiol*. 2014;25:443-447.
16. Das C, Rathinam D, Manchanda S, Srivastava D. Endovascular uterine artery interventions. *Indian J Radiol Imaging*. 2017;27:488.
17. Taran FA, Stewart EA, Brucker S. Adenomyosis: epidemiology, risk factors, clinical phenotype and surgical and interventional alternatives to hysterectomy. *Geburtshilfe Frauenheilkd*. 2013;73:924-931.
18. Cheung VYT. Current status of high-intensity focused ultrasound for the management of uterine adenomyosis. *Ultrasonography*. 2017; 36:95-102.
19. Hou Y, Qin Z, Fan K, Xu Y, Huang X. Combination therapeutic effects of high intensity focused ultrasound and metformin for the treatment of adenomyosis. *Exp Ther Med*. 2018;15:2104-2108.
20. Popovic M, Puchner S, Berzaczy D, Lammer J, Bucek RA. Uterine artery embolization for the treatment of adenomyosis: a review. *J Vasc Interv Radiol*. 2011;22:901-909.
21. de Bruijn AM, Smink M, Hehenkamp WJK, Nijenhuis RJ, Smeets AJ, Boekkooi F, Reuwer PJH, van Rooji WJ, Lohle PNM. Uterine artery embolization for symptomatic adenomyosis: 7-year clinical follow-up using UFS-Qol questionnaire. *Cardiovasc Intervent Radiol*. 2017;40:1344-1350.
22. Nishida M, Takano K, Arai Y, Ozone H, Ichikawa R. Conservative surgical management for diffuse uterine adenomyosis. *Fertil Steril*. 2010;94:715-719.
23. Fujishita A, Masuzaki H, Khan KN, Kitajima M, Ishimaru T. Modified reduction surgery for adenomyosis. *Gynecol Obstet Invest*. 2004;57:132-138.
24. Kwack JY, Kwon YS. Laparoscopic Surgery for Focal Adenomyosis. *JSLs*. 2017;21(2):2017.