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Complications of deep infiltrative endometriosis of gastrointestinal tract

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ABSTRACT

Objective. To summarize the literature data on the main complications of deep infiltrative endometriosis, including ileocecal.

Endometriosis is a complex disease that can begin to develop from birth. Despite all the already existing theories of the origin and development of this disease, further large-scale studies are required to investigate the etiology, pathogenesis, and phenotypes of this nosology and its relationship with pain and infertility.

External genital endometriosis often affects various parts of the gastrointestinal tract. The rectosigmoid junction of the colon is most commonly affected (81.3%), followed by the appendix (6.4%), small intestine (4.7%), dome of the cecum (4.1%), and other parts of the gastrointestinal tract (1.7%).

In recent years, interest in ileocecal endometriosis and its timely diagnosis and treatment has begun to grow among practicing specialists. Presently, deep infiltrative endometriosis is widely studied by obstetricians–gynecologists and by related specialists, such as general surgeons, coloproctologists, and gastroenterologists, in connection with extragenital lesions leading to severe complications. Cases of intestinal perforation caused by deep infiltrative endometriosis, bleeding, and small intestinal obstruction have been described.

Keywords: extragenital endometriosis; ileocecal endometriosis; colorectal endometriosis; deep infiltrative endometriosis; small bowel obstruction.

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Осложнения глубокого инфильтративного эндометриоза с поражением различных отделов гастроинтестинального тракта

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АННОТАЦИЯ

Цель обзора — обобщить литературные данные по основным осложнениям глубокого инфильтративного эндометриоза, в том числе илеоцекального.

Эндометриоз — загадочное заболевание, которое может начать развиваться с самого рождения. Несмотря на существующие теории возникновения и развития этого заболевания, всё ещё требуются крупные исследования для получения ответов на многочисленные вопросы об этиологии, патогенезе, фенотипах данной нозологии и её связи с болевым синдром и бесплодием.

Наиболее часто наружный генитальный эндометриоз поражает различные отделы гастроинтестинального тракта. Ректосигмоидный переход толстой кишки поражается чаще (81,3%), за ним следуют аппендикс (6,4%), тонкая кишка (4,7%), купол слепой кишки (4,1%) и другие отделы желудочно-кишечного тракта (1,7%).

В последние годы у практикующих специалистов растёт интерес к проблеме илеоцекального эндометриоза, его своевременной диагностике и лечению. На сегодняшний день глубокий инфильтративный эндометриоз широко изучается не только акушерами-гинекологами, но и специалистами смежных специальностей (общими хирургами, колопроктологами и гастроэнтерологами) в связи с экстрагенитальными поражениями, приводящими к тяжёлым осложнениям. Описаны случаи перфорации кишки из-за глубокого инфильтративного эндометриоза, кровотечения, а также случаи тонкокишечной непроходимости.

Ключевые слова: экстрагенитальный эндометриоз; илеоцекальный эндометриоз; колоректальный эндометриоз; глубокий инфильтративный эндометриоз; тонкокишечная непроходимость.

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深部浸润性子宫内膜异位症合并胃肠道各部分病变的并发症

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摘要

本综述旨在总结有关深部浸润性子宫内膜异位症（包括回盲部子宫内膜异位症）主要并发症的文献资料。

子宫内膜异位症是一种神秘的疾病，可以从出生开始发展。尽管目前已有关于其起源和发展的理论，但仍需进行大量研究，以回答有关这一疾病的病因、发病机制、表型及其与疼痛和不孕的关系等诸多问题。

最常见的是外生殖器子宫内膜异位症影响胃肠道的各个部分。结肠的直肠乙状结肠交界处较常受累（81.3%），其次是阑尾（6.4%）、小肠（4.7%）、盲肠穹隆（4.1%）和胃肠道的其他部位（1.7%）。

近年来，医生们对回盲部子宫内膜异位症及其及时诊断和治疗越来越感兴趣。迄今为止，深度浸润性子宫内膜异位症不仅被妇产科医生广泛研究，也被相关专业的专家（普外科医生、结肠直肠科医生和消化科医生）广泛研究，因为它与导致严重并发症的生殖器外病变有关。曾有因深部浸润性子宫内膜异位症导致肠穿孔、大出血和小肠梗阻的病例。

关键词：生殖器外子宫内膜异位症；回盲部子宫内膜异位症；结肠直肠子宫内膜异位症；深部浸润性子宫内膜异位症；小肠梗阻。

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INTRODUCTION

The review is based on publications identified by searching PubMed and Google Scholar. This summary will be of clinical interest to gynecologists and other specialists such as general surgeons, proctologists, and gastroenterologists.

PATHOGENESIS OF ENDOMETRIOSIS

Endometriosis is a hard-to-understand disease that may develop from birth. Its pathogenesis is supported by several theories [1]. One of the earliest theories (implantation) is called the implantation theory. It was proposed by J.A. Sampson in 1927. The author suggested that the first stage in development of endometriosis was the retrograde flow of menstrual blood through the fallopian tubes into the peritoneal cavity [2]. Burney and Giudice proposed the metaplasia theory, which states that metaplasia involves the transformation of normal peritoneal tissue to ectopic endometrial tissue [3]. Other authors consider endometriosis to be an inflammatory disease. In women with endometriosis, the peritoneal fluid is remarkable for an increased number of activated macrophages and important differences in the cytokine/chemokine profile [4]. Petraglia and Chapron consider deep infiltrating endometriosis a different phenotype of the same disease, shared with endometriomas and peritoneal lesions. It includes two locations: anterior compartment disease (bladder) and posterior compartment disease (vagina, uterosacral ligaments, rectum, and ureters) [5]. Two different pathogenetic hypotheses have been proposed by Gordts et al. in a recent review [6]. The first hypothesis is that early endometriosis develops as a result of neonatal uterine bleeding associated with cyclic menstruation and stimulates formation of adenomyotic nodules. The second hypothesis is that deep infiltrating endometriosis is a specific type of abnormal benign tumor resembling endometrium. These authors propose that uterine adenomyosis and deep infiltrating endometriosis have common origins, as in both cases glands are seen infiltrating muscle tissue.

Despite existing theories about the origin and evolution of endometriosis, large-scale studies are still required to address numerous questions about the etiology, pathogenesis, phenotypes of this disease, and its association with pain and infertility. This is exactly what the Endometriosis Action Group says in a recent article published in the Journal of Minimally Invasive Gynecology (JMIG), which offers a wide range of questions be answered [7].

EXTRAGENITAL ENDOMETRIOSIS

Endometriosis can be genital or extragenital [8]. Most commonly, extragenital endometriosis affects various parts of the gastrointestinal tract (32.3%), the ureters and bladder (5.9%), the diaphragm, and other sites including nerves and skin (61.8% total) [9, 10]. The rectosigmoid junction is most commonly affected (81.3%), followed by the appendix (6.4%), small intestine (4.7%), cecal dome (4.1%), and other parts of the gastrointestinal tract (1.7%) [11].

Current research and clinical guidelines cover a wide range of issues related to the diagnosis and treatment of bowel endometriosis. The PubMed database contains 686 publications on this topic, published between 1958 and 2024. There are only 107 publications that are dedicated to ileocecal endometriosis.

The most recent update of the European Society of Human Reproduction and Embryology guidelines (ESHRE 2022) makes only a passing mention of the issue of ileocecal endometriosis [12].

In recent years, ileocecal endometriosis, its early diagnosis, and treatment have been of increasing interest to healthcare practitioners. Currently, deep infiltrating endometriosis is widely studied not only by obstetricians and gynecologists, but also by related specialists such as general surgeons, proctologists, and gastroenterologists in the context of extragenital lesions leading to serious complications. Cases of intestinal perforation due to deep infiltrating endometriosis, hemorrhage, and small intestinal obstruction are described.

COMPLICATIONS OF DEEP INFILTRATING ENDOMETRIOSIS

Intestinal perforation. The literature reports only 20 cases of intestinal perforation associated with deep infiltrating endometriosis. Perforations of the intestinal wall in patients with endometriosis most commonly occur during pregnancy and in the postpartum period [13]. The authors associate this with increased progesterone levels, decidualization of the ectopic endometrium, and decreased size of the endometrioid implant in the intestinal wall. Perforations also contribute to the inflammatory response of the intestinal wall in response to decidualization and progressive traction of the enlarged uterus on the intestinal wall.

Large intestinal obstruction. Mechanical intestinal obstructions represent a surgical emergency with a varied etiology that can be encountered in any age group and represent 15% of all emergency hospitalizations presented as abdominal pain [14]. Depending on the location, obstructions are classified as mechanical small intestinal obstruction and large intestinal occlusion (obstruction).

Neoplasia (60%) is the most common cause of mechanical large intestinal obstruction [15]. Strangulating intestinal obstruction (10%–15%) and chronic diverticular disease (10%) are relatively common causes of intestinal obstruction. The remaining 10%–15% are due to less common conditions, including Chron's disease, bacterial or parasitic infections, and endometriosis [14, 15].

A comprehensive literature review in 2023 [16] found that the first case report of intestinal obstruction associated with endometriosis was published in 1954 in the United Kingdom.

Stenotic endometrioid infiltrates were most commonly located in the ileum (38.3% of cases), the rectosigmoid junction (34.5%), the area of the ileocecal angle and cecum (14.9%), and the rectum (10.2%). Only one case [17] reported large bowel obstruction by endometriosis of the hepatic flexure of the colon extending to the transverse colon (0.9%), and in one case [18] the obstruction was caused by an omental giant endometrioid cyst compressing the intestines of45 cm diameter and 4.5 kg weight originating from the greater omentum and compressing the intestine. Intestinal obstruction due to endometriosis is usually diagnosed in women of reproductive age, but six clinical cases of this complication have been reported in postmenopausal patients [18–23].

Small intestinal obstruction. According to case reports in the literature, this complication is usually typical for patients of reproductive age, but there are some exceptions [16]. In Japan, surgical procedures for small intestinal obstruction associated with endometriosis were performed in 2015 and 2021 using single incision laparoscopic surgery (SILS), which is a single-port laparoscopy [20, 24]. In both cases, the affected part of the ileum was resected with end-to-end anastomosis [20, 24]. In 2016, a case report of difficult-to-diagnose small intestinal obstruction was published by an Indian team. In a 44-year-old female patient, Crohn's disease and tuberculosis were considered as differential diagnoses, and endoscopic balloon dilatation of the ileal stricture was attempted twice [25]. However, the patient did not show clinical improvement and needed laparoscopic right hemicolectomy. Endometriosis was diagnosed by histology [25]. Other authors reported an additional 33 cases of ileal obstruction requiring emergency surgery, six of which were performed laparoscopically [16]. Surgeries included 6 ileocecal resections, 12 right hemicolectomies, 19 ileal resections, one ileotransverse colostomy, and one biopsy with isoperistaltic side-to-side ileotransverse anastomosis [16].

Ileocecal intestinal obstruction. Fifteen cases of intestinal obstruction at the level of the ileocecal angle have been reported [16]. In most cases, the lesion was initially suspected to be malignant and a right hemicolectomy was performed. Endometrioid heterotopia in the appendix may lead to local inflammation, suggesting further development of fibrosis and adhesions in this area. Such changes are usually asymptomatic, but in some cases, they can lead to intestinal obstruction. In addition, periodic menstrual bleeding in the ectopic tissue may trigger acute appendicitis.

CONCLUSION

Although intestinal obstruction, hemorrhage, and perforation are rare complications of deep infiltrating endometriosis, clinicians should consider endometriosis as a differential diagnosis in patients of reproductive age with relevant medical histories. Such complications are rarer in menopausal women, but they are still possible. A thorough of history and complaints should be obtained to suspect a lesion in the ileocecal angle and small intestine.

Intraoperatively, macroscopic lesions may resemble neoplastic disease. For this reason, many emergency surgeries end with extensive intestinal resections. In other single cases, benign endometriosis can progress to endometrioid adenocarcinoma [26].

Surgical treatment of any form of endometriosis requires thorough evaluation of the organs for timely diagnosis, treatment, and prevention of complications in patients with ileocecal endometriosis.

ADDITIONAL INFO

Authors' contribution. A.A. Popov — literature review, writing the text and editing the article; K.V. Puchkov — literature review, writing the text and editing the article; V.V. Troshina — analysis of literary sources, writing the text and editing the article; Ju.I. Sopova — editing the article; A.A. Fedorov — editing the article; S.S. Tyurina — editing the article; M.R. Ovsiannikova — editing the article; I.Yu. Ershova — editing the article; S.G. Mamedova — editing the article. All authors confirm that their authorship meets the international ICMJE criteria (all authors made a substantial contribution to the conception of the work, acquisition, analysis, interpretation of data for the work, drafting and revising the work, final approval of the version to be published and agree to be accountable for all aspects of the work).

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