

An Update on the Management of Endometriosis of the Appendix - Review

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Abstract

Endometriosis of the appendix is a condition predominantly observed in young women, characterized clinically by chronic lower abdominal pain. It represents one of the sites of extra-pelvic endometriosis, with diagnosis confirmed through histopathological evaluation of the appendix. A significant challenge for surgeons is determining whether an appendectomy should be performed. The advent of laparoscopic surgery has facilitated enhanced visualization of the pelvis and appendix. This chapter has been conducted to evaluate whether an appendectomy is warranted in all cases of endometriosis.

Keywords: Appendicular Endometriosis, Incidental Appendectomy, Intestinal Endometriosis, Endometriosis, and Laparoscopic Appendectomy

1. Introduction

Endometriosis is a pathological condition affecting the female reproductive system, characterized by the presence of endometrial-like tissue outside the uterine cavity. It predominantly occurs in women of reproductive age, specifically those between 25 and 35 years. Gastrointestinal tract involvement in endometriosis is observed in 12% to 37% of cases, with the rectosigmoid, appendix, caecum, and terminal ileum being the most frequently affected sites. The prevalence of appendiceal endometriosis ranges from 2.6% to 13%, often presenting as acute appendicitis or an appendicular mass, and is reported in 1% to 44.3% of individuals undergoing gynecological surgery. The serosal region is typically involved, with deeper infiltration extending to the muscular and submucosal layers [1–8].

Endometriosis of the appendix may manifest clinically without symptoms or with chronic right-sided abdominal pain. It can also present as acute appendicitis, with definitive diagnosis confirmed through histopathological examination of the appendix [9, 10]. Performing an appendectomy in patients with appendiceal endometriosis offers the benefit of alleviating chronic abdominal pain and mitigating the risk of future appendicitis. Additionally, there is a rationale for conducting an incidental appendectomy during gynecological surgery for endometriosis, as it is associated with reduced morbidity and mortality [11–15].

The advent of laparoscopic surgery has facilitated the diagnosis and treatment of appendiceal endometriosis, as it is associated with a reduction in postoperative complications and expedited recovery [16]. Several risk factors are linked to appendiceal endometriosis, including adenomyosis, right large endometrioma, bladder endometriosis, deep posterior pelvic endometriosis, left deep lateral pelvic endometriosis, and ileocecal endometriosis [17].

The Incidence of appendiceal endometriosis is notably elevated among women diagnosed with deep-infiltrating endometriosis, thereby justifying the consideration of appendectomy during surgical intervention for endometriosis. The pathogenesis of endometriosis is explained by three primary theories: retrograde menstruation accompanied by implantation and inadequate immunological clearance, coelomic metaplasia, and hematological and lymphatic metaplasia [18, 19].

Currently, there is no standardized consensus regarding the management of appendiceal endometriosis. This chapter aims to examine the role of appendectomy in the context of endometriosis and the application of laparoscopic surgery. We conducted a comprehensive literature review utilizing PUBMED, the Cochrane Database of Clinical Reviews, and Google Scholar, focusing on clinical trials, observational studies, cohort studies, case studies, systematic reviews, and meta-analyses published from 1970 to 2025. The search employed the following keywords: “appendicular endometriosis,” “incidental appendectomy,” “intestinal endometriosis,” “laparoscopic appendectomy,” and “endometriosis.” All selected articles were in English.

2. Discussion

2.1. Laparoscopic appendectomy in endometriosis of the appendix

The advent of laparoscopic surgery in the treatment of patients with chronic lower abdominal pain or endometriosis has underscored the significance of inspecting and excising the appendix, as it may be implicated in the manifestation of abdominal pain [20]. A retrospective study conducted by [21] revealed that among 231 patients who underwent appendectomy, abnormal pathology was identified in 115 cases, with appendiceal endometriosis being the most prevalent pathology. The study concluded that the excision of the appendix is warranted during gynecological surgery for endometriosis [21].

Laparoscopic appendectomy is advantageous for patients experiencing chronic abdominal pain due to endometriosis, as it facilitates the examination of the peritoneal cavity and visualization of the pelvic organs. During laparoscopy, the appendix can be inspected, and the decision to perform an appendectomy can be made. This procedure is also associated with reduced morbidity and promotes early ambulation [22–26]. In a retrospective study by [27] involving 135 patients who underwent laparoscopy for endometriosis and concurrent appendectomy, the prevalence of endometriosis of the appendix was found to be 18%. The study concluded that appendectomy should be performed during laparoscopy for endometriosis [27].

In their retrospective study, [28] assessed the intraoperative findings and histopathological characteristics of the appendix in patients undergoing benign gynecological surgery. Their findings indicated that up to 68.2% of cases exhibited abnormal appendiceal pathology. The study concluded that inspecting the appendix is crucial when considering an appendectomy [28]. Similarly, [29] conducted a nonrandomized controlled trial involving 65 patients who underwent laparoscopy for symptomatic endometriosis, of whom 52 underwent appendectomy. Histological examination revealed abnormal appendiceal histology in 75% of these cases. This study also concluded that the appendix should be inspected during laparoscopy, and if abnormalities are detected, it should be excised [29].

Alsallili et al. conducted a prospective evaluation of the histological findings and clinical outcomes in patients who underwent appendectomy during laparoscopy for chronic lower abdominal pain. Among the 100 patients who underwent the procedure, up to 20% of the appendiceal specimens tested positive for endometriosis. This study underscores the significance of performing an appendectomy in cases of chronic abdominal pain and affirms the safety of laparoscopic intervention. These findings are corroborated by retrospective studies conducted by [30, 31] which also emphasize the diagnostic value of laparoscopy in patients with chronic pelvic pain [30–32].

Peters et al. conducted a review on the safety and efficacy of performing appendectomy during laparoscopic surgery for benign gynecological conditions. They concluded that appendectomy should be performed in cases of benign gynecological conditions such as endometriosis, as the procedure is safe and associated with low morbidity [33]. [33] conducted a retrospective study on the safety and efficacy of incidental appendectomy during laparoscopic surgery for ovarian endometrioma. The study included 356 patients, of whom 172 underwent an interval appendectomy. Among the 172 appendix specimens, 52 exhibited abnormal presentations, and 16 were found to have endometriosis. This study concluded that incidental appendectomy does not increase morbidity or operative time and serves a diagnostic purpose [34].

2.2. Histopathological examination of endometriosis of the appendix

The histopathological examination of the appendix specimen is crucial for establishing a diagnosis in patients who have undergone an appendectomy, particularly when gynecological conditions such as endometriosis are potential causes of right lower abdominal pain. The diagnosis of endometriosis is confirmed through surgical excision and subsequent histopathological evaluation [35–38]. A systematic review and meta-analysis conducted by [39] underscores the significance of routine histopathological examination of the appendix post-appendectomy in identifying unexpected conditions, including endometriosis or malignancy [39].

Ross et al. conducted a histological evaluation of appendix specimens from patients with endometriosis who had undergone appendectomy. Their retrospective study revealed that up to 14.9% of cases were histologically diagnosed with endometriosis, underscoring the significance of performing appendectomy during surgical management for chronic abdominal pain associated with endometriosis [40]. Similarly, [41] performed a retrospective study on the histological evaluation of patients who had undergone appendectomy for endometriosis. This study demonstrated lumen obliteration with infiltration of endometrial-like stromal cells, with no evidence of malignancy, highlighting the critical importance of histological evaluation of the appendix [41].

Chandrasegaran et al. conducted an analysis of appendiceal pathologies in a cohort of 2,284 female patients, revealing a negative appendectomy rate of 31%. Among these cases, up to 14 instances were identified as appendiceal endometriosis. This study underscores the significance of endometriosis as a contributing factor to negative appendectomies [42, 43]. [42, 43] performed a retrospective assessment of 51 appendiceal endometriosis specimens, with histological examination indicating involvement of the serosal and muscular layers, accompanied by lumen obliteration. This finding emphasizes the critical role of histological evaluation in appendiceal assessments [43]. Furthermore, a systematic review by [44]. On the routine histological evaluation of appendectomy specimens demonstrated that, despite the low incidence of abnormal findings, histopathological evaluation remains essential and should be routinely practiced [44].

Table 1: The prevalence of endometriosis of the appendix

Author	Sample size(N)	Study design	Prevalence of endometriosis
Harris et al [29]	52	Nonrandomized clinical trial	31%
Berker et al [21]	231	Retrospective study	44.3%
Moulder et al [19]	1876	Retrospective study	13.2%
Coratti et al [9]	149	Observational case-control study	14.7%
Ross et al [40]	609	Retrospective study	14.9%
Nikou et al [27]	135	Retrospective study	18%

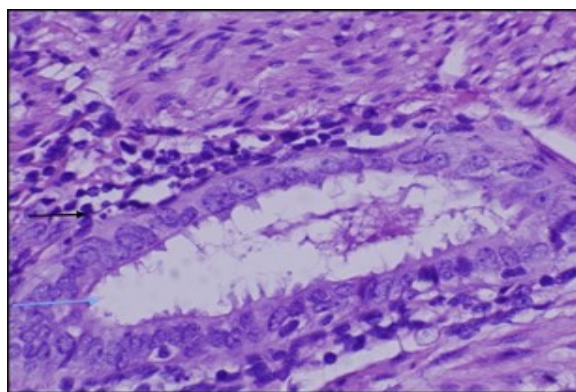


Figure 1: Microscopic examination of the appendix showing endometrial tissue in the appendix specimen

3. Conclusion

The significance of performing an appendectomy in patients presenting with chronic lower abdominal pain, as well as in asymptomatic patients with endometriosis, underscores the necessity of addressing this condition, which can be confirmed through histopathological evaluation. The application of diagnostic laparoscopy emphasizes the importance of inspecting the appendix and conducting an appendectomy. In patients undergoing other gynecological procedures, an incidental appendectomy is typically recommended to rule out endometriosis and prevent future instances of chronic abdominal pain. The gross appearance of the appendix may not reveal any abnormalities; therefore, appendectomy and histological evaluation are crucial for establishing a diagnosis of this condition.

Article Information

Conflict of interest: There is no conflict of interest.

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