SURGICAL AND NONOPERATIVE APPROACHES TO THE TREATMENT OF UNCOMPLICATED ACUTE APPENDICITIS IN CHILDREN

Munavvarov Zikirulloxon Dadaxon o'g'li
Chust District Medical Association,
Namangan Region, Uzbekistan
Email: zikirullomunavarov@gmail.com
Phone: +998(93)2700042

Abstract. *Acute uncomplicated appendicitis is one of the most common causes of emergency abdominal surgery in children. Appendectomy, particularly laparoscopic appendectomy, remains the established treatment approach; however, antibiotic-based nonoperative management has emerged as an alternative for carefully selected pediatric patients. The choice between surgical and nonoperative treatment requires consideration of clinical presentation, diagnostic findings, disease severity, treatment effectiveness, and the risk of recurrence or subsequent surgical intervention. This article examines contemporary approaches to the management of uncomplicated acute appendicitis in children, focusing on the clinical indications, potential benefits, limitations, and safety considerations of surgical and nonoperative strategies. Particular attention is given to laparoscopic appendectomy, antibiotic therapy, patient selection criteria, treatment failure, recurrence, complications, length of hospital stay, and the need for readmission. The clinical applicability of nonoperative management depends on the accurate identification of uncomplicated disease, the presence or absence of an appendicolith, and the availability of appropriate clinical monitoring and follow-up. Although antibiotic treatment may allow some children to avoid immediate surgery, the possibility of treatment failure, recurrent appendicitis, and subsequent appendectomy must be considered when discussing treatment options with patients and their families. Surgical management provides definitive removal of the appendix but involves operative risks and postoperative recovery. An individualized approach based on clinical assessment, diagnostic findings, and evidence-based recommendations is therefore essential when selecting the optimal treatment strategy. Improving patient selection and establishing clear criteria for treatment monitoring may contribute to safer clinical decision-making and better outcomes in children with uncomplicated acute appendicitis.*

Keywords: *acute appendicitis; children; pediatric surgery; laparoscopic appendectomy; nonoperative management; antibiotic therapy; treatment outcomes; recurrence.*

Аннотация. *Острый неосложнённый аппендицит является одной из наиболее распространённых причин экстренного хирургического вмешательства у детей. Аппендэктомия, в частности лапароскопическая аппендэктомия, остаётся общепринятым методом лечения, однако антибиотикотерапия без первичного хирургического вмешательства рассматривается как альтернативный подход у тщательно отобранных пациентов детского возраста. Выбор между хирургическим и неоперативным лечением требует учёта клинических проявлений, результатов диагностических исследований, тяжести заболевания, эффективности терапии и риска рецидива или последующего хирургического вмешательства. В статье рассматриваются современные подходы к лечению острого неосложнённого аппендицита у детей с акцентом на клинические показания, потенциальные преимущества, ограничения и аспекты безопасности хирургической и неоперативной стратегий. Особое внимание уделяется лапароскопической аппендэктомии, антибиотикотерапии, критериям отбора пациентов, неэффективности лечения, рецидивам, осложнениям, продолжительности госпитализации и необходимости повторного обращения за медицинской помощью. Применимость неоперативного лечения зависит от точности диагностики неосложнённой формы заболевания, наличия или отсутствия аппендиколита, а также возможности надлежащего клинического наблюдения и последующего контроля. Несмотря на то что антибиотикотерапия позволяет некоторым детям избежать немедленного хирургического вмешательства, при выборе тактики лечения необходимо учитывать вероятность неэффективности терапии, рецидива аппендицита и последующей аппендэктомии. Хирургическое лечение обеспечивает окончательное удаление червеобразного отростка, однако сопряжено с операционными рисками и необходимостью послеоперационного восстановления. Таким образом, выбор оптимальной лечебной стратегии должен основываться на индивидуальной клинической оценке, результатах диагностических исследований и принципах доказательной медицины. Совершенствование критериев отбора пациентов и разработка чётких алгоритмов наблюдения могут способствовать повышению безопасности лечения и улучшению клинических результатов у детей с острым неосложнённым аппендицитом.*

Ключевые слова: *острый аппендицит, дети, детская хирургия, лапароскопическая аппендэктомия, неоперативное лечение, антибиотикотерапия, результаты лечения, рецидив.*

Annotatsiya. *O‘tkir asoratsiz appenditsit bolalarda shoshilinch qorin bo‘shlig‘i jarrohlik amaliyotiga sabab bo‘ladigan eng keng tarqalgan kasalliklardan biridir.*

Appendektomiya, xususan, laparoskopik appendektomiya, ushbu kasallikni davolashning keng qabul qilingan usuli hisoblanadi. Biroq antibiotiklar yordamida, dastlabki jarrohlik aralashuvisiz davolash tegishli mezonlarga javob beradigan bolalar uchun muqobil yondashuv sifatida qaralmoqda. Jarrohlik va nooperativ davolash usullarini tanlashda klinik belgilar, diagnostik tekshiruvlar natijalari, kasallikning og'irlik darajasi, davolash samaradorligi hamda kasallikning qaytalanishi yoki keyinchalik jarrohlik aralashuviga ehtiyoj tug'ilishi ehtimolini hisobga olish zarur. Mazkur maqolada bolalarda o'tkir asoratsiz appenditsitni davolashning zamonaviy yondashuvlari, jumladan, jarrohlik va nooperativ davolash strategiyalarining klinik ko'rsatmalari, potensial afzalliklari, cheklovlari va xavfsizlik jihatlari yoritiladi. Laparoskopik appendektomiya, antibiotikoterapiya, bemorlarni tanlash mezonlari, davolash samarasizligi, kasallikning qaytalanishi, asoratlar, shifoxonada qolish muddati va takroriy tibbiy murojaat zaruratiga alohida e'tibor qaratiladi. Nooperativ davolashning klinik jihatdan qo'llanishi kasallikning asoratsiz shaklini aniq tashxislash, appendikolitning mavjudligi yoki yo'qligi, shuningdek, bemorni tegishli klinik kuzatish va keyingi nazorat qilish imkoniyatlariga bog'liq. Antibiotikoterapiya ayrim bolalarda darhol jarrohlik aralashuvidan qochish imkonini bersa-da, davolash samarasizligi, appenditsitning qaytalanishi va keyinchalik appendektomiya o'tkazish ehtimoli hisobga olinishi lozim. Jarrohlik davolash chuvalchangsimon o'simtani olib tashlash orqali kasallik o'chog'ini bartaraf etadi, biroq operatsion xavflar va operatsiyadan keyingi tiklanish davri bilan bog'liq. Shu sababli optimal davolash strategiyasini tanlash individual klinik baholash, diagnostik tekshiruvlar natijalari va dalillarga asoslangan tibbiyot tamoyillariga tayanishi kerak. Bemorlarni tanlash mezonlarini takomillashtirish va kuzatuvning aniq algoritmlarini ishlab chiqish o'tkir asoratsiz appenditsit bilan kasallangan bolalarda davolash xavfsizligini oshirish hamda klinik natijalarni yaxshilashga yordam berishi mumkin.

Kalit so'zlar: *o'tkir appenditsit, bolalar, bolalar jarrohligi, laparoskopik appendektomiya, nooperativ davolash, antibiotikoterapiya, davolash natijalari, kasallikning qaytalanishi.*

Introduction. Acute uncomplicated appendicitis is one of the most common indications for emergency abdominal surgery in children. Laparoscopic appendectomy has traditionally been considered the standard treatment because it provides definitive removal of the inflamed appendix. However, advances in diagnostic imaging, antimicrobial therapy, and clinical monitoring have increased interest in nonoperative management using antibiotics in appropriately selected pediatric patients [1,2]. The choice between surgical and nonoperative treatment remains an important clinical question. Although antibiotic therapy may allow some children to avoid surgery,

treatment failure, recurrent appendicitis, readmission, and subsequent appendectomy remain relevant concerns. Conversely, surgical management provides definitive treatment but involves anesthesia, operative risks, and postoperative recovery [1,3]. Recent randomized controlled trials and updated international guidelines have contributed important evidence regarding the effectiveness and safety of these approaches. Nevertheless, differences in patient selection, diagnostic criteria, follow-up duration, and definitions of treatment failure complicate direct comparisons between treatment strategies [2,3]. The aim of this article is to describe the principal clinical characteristics, advantages, limitations, and outcomes of surgical and nonoperative management of uncomplicated acute appendicitis in children, with particular attention to patient selection, treatment failure, recurrence, and evidence-based clinical decision-making.

Methods. The article was prepared as a structured overview of published scientific evidence concerning surgical and nonoperative management of uncomplicated acute appendicitis in children. Relevant publications included randomized controlled trials, systematic reviews, meta-analyses, observational studies, and international clinical guidelines. Particular attention was given to the international multicentre randomized trial published in *The Lancet* in 2025, the 2025 systematic review and meta-analysis of randomized trials, and the updated World Society of Emergency Surgery (WSES) guidelines published in 2026 [1–3].

The principal areas of interest were:

- Clinical and imaging criteria for identifying uncomplicated appendicitis.
- Outcomes of laparoscopic appendectomy and antibiotic-based treatment.
- Initial treatment failure and subsequent appendectomy.
- Recurrence, complications, and hospital readmission.
- Patient selection, including the presence or absence of an appendicolith.
- Recommendations for clinical monitoring and follow-up.

The findings were summarized qualitatively. No new patient data were collected, and no independent statistical meta-analysis was performed.

Results and discussion. Laparoscopic appendectomy remains the established surgical approach for acute appendicitis in children. Its principal advantage is definitive removal of the inflamed appendix, thereby eliminating the risk of recurrent appendicitis in the removed organ. Surgical treatment also provides direct assessment of the appendix and the opportunity to identify unexpected intra-abdominal pathology. The advantages of laparoscopic surgery include effective source control, a generally short postoperative recovery period, and a low likelihood of subsequent appendicitis in the removed appendix. Nevertheless, surgery requires anesthesia and carries potential risks, including wound infection, intra-abdominal infection, postoperative pain, and

other perioperative complications. The magnitude of these risks depends on disease severity, patient characteristics, and the quality of perioperative care [2,4]. Nonoperative management generally involves antibiotic treatment, clinical observation, and reassessment of the patient's condition. It may be considered for selected children with confirmed uncomplicated appendicitis, particularly when imaging does not demonstrate an appendicolith or other findings suggesting complicated disease [2,4].

The principal potential advantage of antibiotic treatment is the possibility of avoiding immediate surgery and its associated operative and anesthetic risks. However, the success of this strategy depends on appropriate patient selection, clinical stability, reliable monitoring, and timely access to surgical treatment if the condition deteriorates. A major limitation is the possibility of treatment failure or recurrent appendicitis. Families should therefore receive clear information about the likelihood of subsequent surgery, warning symptoms, and the importance of follow-up. Nonoperative management should not be interpreted as an approach that eliminates the need for surgical assessment. An important contribution to this field was made by the international multicentre randomized controlled trial published in *The Lancet* in 2025. The study compared appendectomy with antibiotic treatment in children aged 5–16 years with suspected nonperforated appendicitis. The primary objective was to determine whether antibiotic treatment was noninferior to appendectomy in terms of treatment failure [1]. The trial did not establish the noninferiority of antibiotic treatment compared with appendectomy. This finding indicates that the two approaches should not automatically be considered equivalent in terms of treatment success. The results also emphasize the importance of discussing the possibility of treatment failure and subsequent surgery with children and their families

An updated meta-analysis of randomized controlled trials published in the *Journal of Pediatric Surgery* in 2025 further examined the effectiveness of nonoperative management in children with uncomplicated appendicitis. Its principal outcomes included initial treatment failure, treatment failure within one year after discharge, and overall treatment failure. Taken together, these publications demonstrate that antibiotic treatment remains a potential option for selected patients, but its effectiveness must be evaluated in relation to the outcome definitions, follow-up periods, and selection criteria used in individual studies. Accurate identification of uncomplicated appendicitis is essential when considering nonoperative management. Clinical examination, laboratory investigations, and appropriate imaging should be used together to distinguish uncomplicated disease from perforation, abscess formation, or other complicated presentations. The presence of an appendicolith is particularly important because it has been associated with an increased likelihood of

failure of nonoperative treatment. The 2020 WSES guidelines recommended discussing antibiotic-based treatment as an alternative for selected children without an appendicolith, while emphasizing the possibility of treatment failure and diagnostic misclassification [4]. The updated 2025 edition of the WSES guidelines, published in 2026, provides a more recent evidence-based framework for the management of acute appendicitis across different patient populations. Ultrasonography is generally an appropriate first-line imaging investigation in children with suspected appendicitis. Further imaging may be considered when the initial examination is inconclusive and additional diagnostic clarification is necessary. The two treatment strategies differ in their immediate objectives and long-term implications. Laparoscopic appendectomy provides definitive surgical treatment but requires an operation and anesthesia. Nonoperative management may avoid immediate surgery but requires careful patient selection, observation, and acceptance of the possibility of recurrence or subsequent appendectomy. The comparison should therefore extend beyond initial symptom resolution. Clinically relevant outcomes include treatment failure, recurrence, complications, readmission, duration of hospitalization, recovery time, healthcare resource use, and patient and family preferences. Differences in study design and outcome definitions should also be considered when interpreting the published evidence. Results from selected patients treated under controlled research protocols may not be directly generalizable to every clinical setting. The choice of treatment should consequently be individualized rather than based on the assumption that one strategy is optimal for all children.

Conclusion. Surgical and nonoperative management are two approaches to the treatment of acute uncomplicated appendicitis in children, but they differ in their immediate benefits, limitations, and potential long-term outcomes. Laparoscopic appendectomy remains an established definitive treatment. Antibiotic-based nonoperative management may be considered for carefully selected children following appropriate diagnostic assessment and discussion of the risks of treatment failure and recurrence. The available randomized evidence does not support assuming that antibiotic treatment is equivalent to appendectomy in every pediatric patient. Patient selection, particularly assessment for an appendicolith and exclusion of complicated appendicitis, is essential when considering nonoperative treatment. Future clinical research should continue to evaluate treatment success, recurrence, complications, quality of life, healthcare utilization, and long-term outcomes. Shared decision-making involving clinicians, children when developmentally appropriate, and their families is important for selecting a treatment strategy that reflects the clinical evidence and the individual patient's circumstances.

References

1. St Peter SD, Noel-MacDonnell JR, Hall NJ, et al. Appendicectomy versus antibiotics for acute uncomplicated appendicitis in children: an open-label, international, multicentre, randomised, non-inferiority trial. The Lancet. 2025;405(10474):233–240. https://doi.org/10.1016/S0140-6736(24)02420-6

2. Podda M, Ceresoli M, De Simone B, et al. Diagnosis and Treatment of Acute Appendicitis: 2025 Edition of the World Society of Emergency Surgery Jerusalem Guidelines. JAMA Surgery. 2026;161(3):283–295. https://doi.org/10.1001/jamasurg.2025.6218

3. Can Antibiotic Therapy Replace Surgery in Pediatric Acute Uncomplicated Appendicitis? An Updated Meta-Analysis of Randomized Controlled Trials. Journal of Pediatric Surgery. 2025;60(11):162565. https://doi.org/10.1016/j.jpedsurg.2025.162565

4. Di Saverio S, Podda M, De Simone B, et al. Diagnosis and treatment of acute appendicitis: 2020 update of the WSES Jerusalem guidelines. World Journal of Emergency Surgery. 2020;15:27. https://doi.org/10.1186/s13017-020-00306-3.

