Prognostic value of the histopathology of the appendix for children with recurrent appendicitis

Evita Brigere[1,2] Astra Zviedre[3,5], Arnis Enģelis[3,4], Vilnis Titāns[5], Aigars Pētersons[3]

1 Department of Paediatrics, Children's Clinical University Hospital, Riga, Latvia
2 Department of Paediatrics, Riga Stradiņš University, Riga, Latvia
3 Department of Paediatric Surgery, Riga Stradiņš University, Riga, Latvia
4 Department of Paediatric Surgery, Children's Clinical University Hospital, Riga, Latvia
5 Outpatient Clinic "LaTi & Co" Ltd, Riga, Latvia

Rīga Stradiņš University

Children's University Hospital Latvia

8th World Congress of Pediatric Surgery WOFAPS 12-15 November 2025 Antalya, Türkiye

"LaTi & Co" Ltd
OUTPATIENT CLINIC

Introduction

Appendicitis is an inflammation of the appendix and is the most common abdominal surgical emergency in childhood. Several factors determine choice of treatment [3].

Nonoperative management (NOM) is eligible in 20% of cases [2]. By 1 year after successful NOM up to 32% of patients develop recurrent appendicitis (RA) and appendectomy is done [1,2]. RA can present with its clinical challenges and often can lead to delayed management.

Aim

To determine prognostic value of the histopathology of the appendix for children with recurrent appendicitis (RA).

Materials and methods

A retrospective cohort study was conducted for patients (7-18 years) with RA in paediatric tertiary care institution (January 2019 - December 2022). All patients underwent appendectomy (interval or urgent) (Fig.1). Data analysis of duration of symptoms, Alvarado score (AS), serum C-reactive protein (CRP), interleukin-6 (IL-6), white blood cells count (WBC), abdominal ultrasound (US) among patients were obtained during the first episode of uncomplicated acute appendicitis (AA) (Table 1). The analysis of the data was processed by IBM SPSS 29 ($p<0.05$). Ethical approval was given by the local institutional review board.

Results

The study included 63 patients with the mean age of 12.4 (SD 2.6), of them 37 (58.7%) were boys. A relapse during a 6-month period after the first AA episode was observed for 27 patients (42.9%) and 61.9% (39) of patients relapsed within a year. Most interval appendectomies were seen in chronic RA group (62,5%) but more than half (59,6%) of urgent appendectomies were performed in complicated RA group (Fig.1). Patients with chronic RA had significantly lower cut-off values of WBC compared to uncomplicated RA ($p=0.045$). Patients with complicated RA had a tendency towards statistical significance: they were younger than patients with uncomplicated RA ($H(2)=5.171$, $p=0.075$). There were no statistically significant differences among the study groups for the following parameters: duration of symptoms, AS, CRP, IL-6 and US findings (Table 1).

Figure 1.

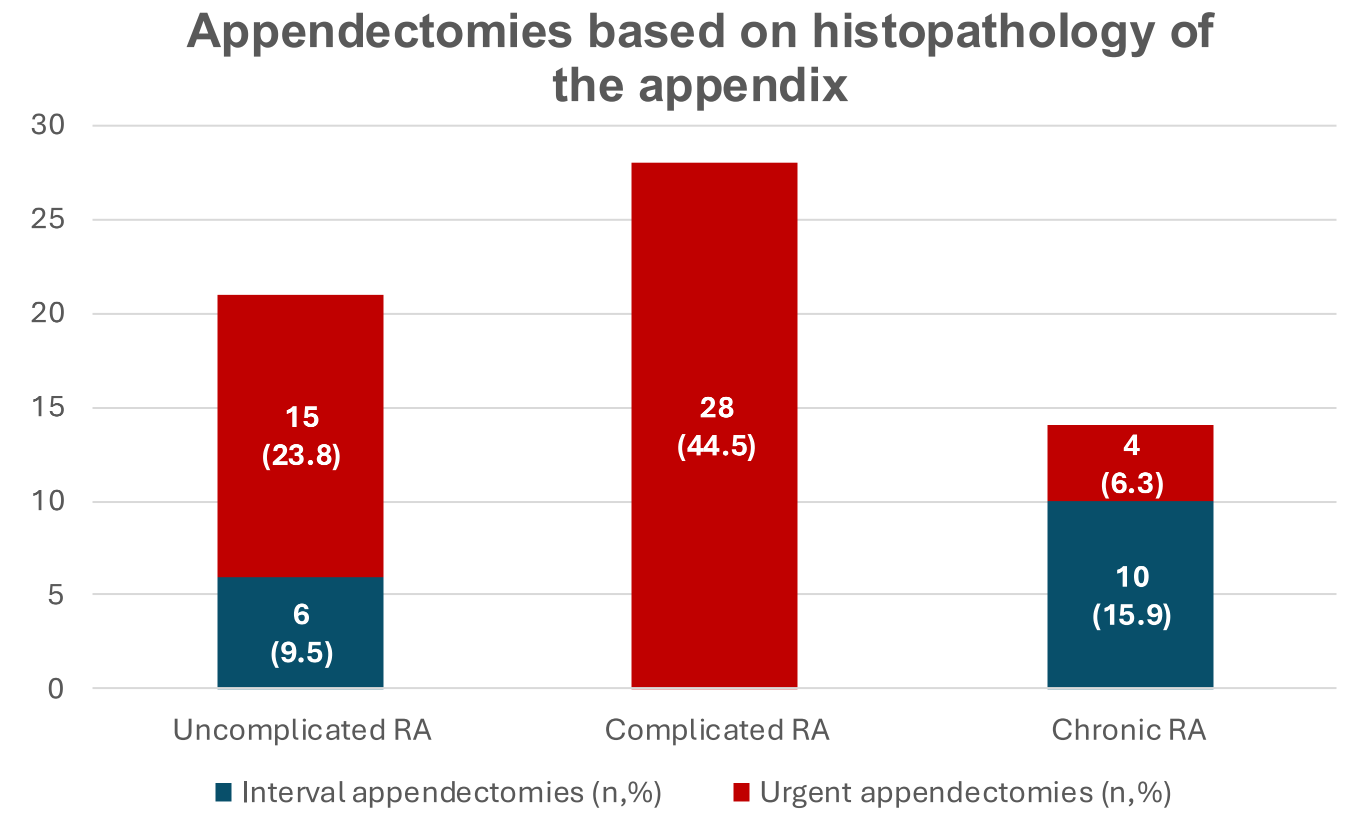

Table 1.

Comparison of clinical und laboratory characteristics among patients with uncomplicated, complicate and chronic appendicitis

Characteristics	Uncomplicated RA	Complicated RA	Chronic RA	p value
Total, n (%)	21 (33.3)	28 (44.5)	14 (22.2)	
Male/Female, n	11/10	17/11	9/5	0.75[c]
Age in years, mean (SD*)	13.1 (2.5)	11.6 (2.6)	13.1 (2.7)	**0.075**[a]
Duration of symptoms <12h*, n (%)	13 (20.6)	15 (23.8)	5 (7.9)	0.66[c]
Alvarado score, mean (SD)	7 (1)	6.5 (1.2)	6.2 (1)	0.11[a]
CRP, median (IQR*)	1.5 (0.98-5.9)	2.58 (0.91-13.2)	4.32 (2.73-16.86)	0.16[a]
IL-6, median (IQR)	9.85 (3.43-15.5)	20.7 (12.3-48.9)	16.7 (14.0-39.4)	0.15[a]
WBC, median (IQR)	15.64 (14.44-17.31)	14.35 (10.92-18.31)	12.75 (10.31-14.46)	0.05[a] **0.045**[b]
US (appendix d*≥7mm), n (%)	18 (28.6)	20 (31.7)	10 (15.9)	0.26[c]

*d-diameter, h-hours, SD-standard deviation
[a]Kruskal-Wallis Test, $p<0.05$ comparison of all study groups, [b]Bonferroni test $p<0.05$ (chronic RA compared to uncomplicated RA), [c]χ^2 test, $p>0.05$

Conclusion

WBC can be used as a prognostic value determining the histopathology of appendix for children with RA. Children with normal or slightly elevated WBC receiving conservative treatment of AA could be predicted to receive interval appendectomy in a case of RA.

References

1 Lipsett SC, Monuteaux MC, Shanahan KH, Bachur RG. Nonoperative Management of Uncomplicated Appendicitis. Pediatrics. 2022 May 1;149(5):e2021054693. doi: 10.1542/peds.2021-054693. PMID: 35434736.

2 Minneci, Peter C et al. "Association of Nonoperative Management Using Antibiotic Therapy vs Laparoscopic Appendectomy With Treatment Success and Disability Days in Children With Uncomplicated Appendicitis." *JAMA* vol. 324,6 (2020): 581-593. doi:10.1001/jama.2020.10888

3 St Peter, Shawn D et al. "Appendicectomy versus antibiotics for acute uncomplicated appendicitis in children: an open-label, international, multicentre, randomised, non-inferiority trial." *Lancet (London, England)* vol. 405,10474 (2025): 233-240. doi:10.1016/S0140-6736(24)02420-6