



Article

Factors Associated with Surgical Intervention in Pediatric Cervical Lymphadenitis: A Cohort Study

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Abstract: Cervical lymphadenitis in children, often caused by bacterial infections, may require surgical drainage if initial antibiotic treatment fails. Identifying factors associated with surgical intervention may aid in treatment decision-making and improve patient outcomes. We assessed the demographic, clinical, and laboratory factors associated with the need for surgical drainage in children diagnosed with cervical lymphadenitis. We conducted a retrospective cohort study of children diagnosed with cervical lymphadenitis or abscesses between 2015 and 2021. Data collected included demographics, clinical presentation, laboratory results, imaging findings, and treatment outcomes. Surgical intervention was compared to the conservative treatment group to identify predictors for drainage. Overall, 201 children were included; 87 (43%) underwent surgical drainage, while 114 (57%) received conservative treatment. In univariate analysis, young age (<3 years), leukocytosis ($>15,000/\text{mm}^3$), and longer hospitalization duration (5.6 vs. 3.2 days, $p < 0.001$) were associated with surgical intervention. Methicillin-susceptible *Staphylococcus aureus* (MSSA) and methicillin-resistant *Staphylococcus aureus* (MRSA) were the most common pathogens isolated from abscess cultures. In multivariate analysis, factors associated with surgical drainage included large lymph node size (>3 cm), erythema, and fluctuance in the physical examination and imaging (ultrasound) findings of abscess or phlegmon. Surgical intervention in pediatric cervical lymphadenitis was found to be associated with young age, large lymph nodes, erythema, and abscesses on imaging. Early assessment and recognition of these factors can guide the timely initiation of appropriate treatment, including surgery, when indicated.

Keywords: cervical lymphadenitis; abscess; surgical drainage; conservative treatment; children



Academic Editor: Athanasios Tsakris

Received: 25 February 2025

Revised: 19 March 2025

Accepted: 24 March 2025

Published: 1 April 2025

Citation: Hazout, C.; Saif, M.; Ben-Shimol, S.; Shmueli, M.; Ziv, O.; Perry, Z.H.; Yafit, D. Factors Associated with Surgical Intervention in Pediatric Cervical Lymphadenitis: A Cohort Study. *Acta Microbiol. Hell.* **2025**, *70*, 13. <https://doi.org/10.3390/amh70020013>

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1. Introduction

Head and neck infections often lead to reactive lymphoid hyperplasia and acute cervical lymphadenopathy. Lymph node suppuration may occur due to bacterial infiltration of lymphatic tissue, resulting in cervical lymphadenitis [1]. Management includes careful history taking, physical examination, and further investigations, such as ultrasound (US) or computed tomography (CT) imaging studies. In most cases of cervical lymphadenitis, especially in stable patients, a conservative antibiotic therapy is effective and provides

coverage for the most common etiologic agents, including staphylococcal and streptococcal bacteria [1–3]. Bacterial invasion of lymphatic tissue within the neck carries the potential for abscess formation, which may subsequently spread to adjacent neck spaces, manifesting as parapharyngeal or retropharyngeal abscesses [4]. Furthermore, these abscesses may further extend to other regions, such as the mediastinum and along the vertebral spine [5]. Consequently, life-threatening complications like airway obstruction, jugular vein thrombosis, pericarditis, pneumonia, and arterial erosion may occur, highlighting the serious potential of this condition and the need to proceed to surgical drainage when indicated [6–8].

In most cases, surgical intervention is reserved for cases with an abscess that failed to improve following medical treatment with intravenous antibiotics or for patients with an impending airway or septicemia [3,7,9]. Factors associated with surgical drainage in the pediatric population include previous antibiotic use, young age (<4 years), and fluctuation in physical examination [9,10]. Similarly, large lymph nodes sized 25–30 mm or bigger, fever, and high leukocyte (white blood cell; WBC) count were associated with surgery [2,11,12].

As for imaging investigations, physicians should be cautious in using the CT modality, as it exposes pediatric patients to ionizing radiation [9]. Ultrasound is considered the primary imaging modality of choice to assess the nature of neck masses due to its availability, high resolution, and lack of radiation exposure, although it may not demonstrate parapharyngeal or retropharyngeal abscesses [13]. Nevertheless, imaging studies often do not positively contribute to patient care [14,15]. Therefore, it is reasonable to treat patients conservatively with antibiotics, followed by imaging studies in selected cases that failed to improve after 24–48 h of appropriate antibiotic therapy [13].

Using different factors to help determine which patients are at risk for surgical intervention may improve the quality of care by minimizing unnecessary investigations and procedures and may allow physicians to better predict the right modalities to use [11]. The objective of this study was to investigate the association between demographic and clinical variables and the need for surgical intervention in children with cervical lymphadenitis and lymph node abscesses.

2. Materials and Methods

2.1. Study Design

This was a retrospective cohort study. Data were retrieved from the electronic records of all patients younger than 18 years old with a diagnosis of acute cervical lymphadenitis or abscess. Children admitted to the pediatric departments at the Soroka University Medical Center (SUMC) between January 2015 and December 2021 were included. Diagnoses from the medical charts were based on ICD-9 coding, including codes for enlargement of lymph nodes (785.6), cellulitis and abscess of the neck (682.1), acute lymphadenitis (683), parapharyngeal abscess (478.22), and retropharyngeal abscess (478.24).

The study was approved by the ethics committee of Soroka University Medical Center (SUMC, 0046-22-SOR).

2.2. Setting and Study Population

The SUMC is the only 1200-bed hospital in the Negev district of Southern Israel, providing primary and referral health care services to the entire population of the region (~200,000 children under 18 years). Over 95% of the children in the Negev region are served by the SUMC, as medical insurance for children is universal and free of charge. Cervical lymphadenitis was defined as a reactive lymphoid hyperplasia due to a local inflammatory process, as suggested by the ICD-9 coding.

2.3. Inclusion Criteria

The study population included all patients diagnosed with acute cervical lymphadenitis and abscesses who had a full medical evaluation and treatment documented. All patients were hospitalized and treated at the pediatric wards of the SUMC.

2.4. Exclusion Criteria

All patients with a history of immunocompromised diseases, malignancies of the head and neck, thyroid diseases, infections due to trauma or superficial skin infection in the head and neck, as well as patients with symptoms lasting more than 28 days.

2.5. Study Groups

The study group consisted of patients who underwent surgical intervention and patients treated with antibiotics only (conservative treatment group). We collected comprehensive data on antibiotic treatment in both groups, including its duration. Regarding antimicrobial therapy, intravenous treatment was administered for an average of three days. Transition to oral therapy was typically made upon clinical improvement and, in most cases, after receiving culture results, if available.

2.6. Data Collection

The individual patient data collected included demographic data, including age, sex, and ethnicity (Bedouins, Jews); clinical data, including duration of illness and antibiotic treatment pre-admission, fever, torticollis, and size and characteristics of the cervical mass (swelling, erythema, fluctuance, and tenderness); and laboratory studies, including WBC count, CRP levels, and neutrophil count.

Imaging data findings included the timing of hospitalization, the type of imaging (US, CT, MRI), and findings of abscess size, location, echogenicity, and acoustic enhancement on US and attenuation and rim enhancement on CT.

Surgical intervention data included timing from admission to drainage, presence of pus, drain insertion and duration, post-operative discharge, and the isolated pathogen from the pus collected and cultured.

2.7. Statistical Analysis

The data were analyzed using the SPSS version 29.0 (SPSS, Chicago, IL, USA) software. Descriptive statistics, including mean values and standard deviations (SD), were used to describe the baseline characteristics of the study population. Intergroup comparisons were performed using the Pearson chi-square test for qualitative variables (e.g., texture of the lesion and gender of the patient) and the Fisher exact test for dichotomous variables (like gender vs. procedure type). Comparison of quantitative variables was performed using parametric tests: an independent samples *t*-test (like for the comparison of WBC in the two compared groups) and a Wilcoxon non-parametric test if needed. The level of significance was defined as $p < 0.05$.

If single-variable analysis showed a significant difference between the study groups, a multiple-variable analysis was conducted using logistical and linear regression to pinpoint the predictive factors for surgical treatment.

3. Results

3.1. Demographics and Clinical Parameters

Among 201 children with cervical lymphadenitis, 114 (57%) received conservative treatment, and 87 (43%) underwent drainage (Table 1). Additionally, 110 (54.8%) patients were Bedouins, and 91 (45.2%) were Jewish. The proportion of females was higher in the

drainage group (53.9%) compared to the conservative treatment group (46.1%) ($p = 0.008$). The mean age of patients was 3.8 ± 3.7 years, with those in the drainage group being younger than those receiving conservative treatment.

Table 1. Comparison of children with cervical lymphadenitis who underwent drainage to those treated conservatively.

		Total N = 201	Conservative Treatment N = 114	Drainage N = 87	p-Value
Demographics	Jewish (N, %)	91 (45.2%)	58 (50.8%)	33 (38%)	0.109
	Bedouins (N, %)	110 (54.8%)	56 (49.2%)	54 (62%)	0.109
	Females (N, %)	89 (44.2%)	41 (46.1.1%)	48 (53.9%)	0.008
	Age (years); mean $\pm$ SD, (median)	3.8 ± 3.7 (2.3)	4.4 ± 3.9	3.1 ± 3.3	0.014
Clinical Parameters	Torticollis (N, %)	36 (18.6%)	25 (22.5%)	11 (13.3%)	0.384
	Dysphagia (N, %)	24 (12.4%)	18 (16.2%)	6 (7.2%)	0.097
	Day of presentation from start of illness; mean $\pm$ SD	5.8 ± 8.7	$3.9 (\pm 3.7)$	$5.2 (\pm 3.6)$	0.002
	Prehospitalization antibiotics (%)	113 (58.2%)	60 (54.1%)	53 (63.9%)	0.222
	Temperature at ER ≥ 39.0 (N, %)	61 (30%)	27 (24%)	12 (14%)	0.20
Laboratory Features	Comorbidities (N, %)	19 (9.8%)	8 (7.2%)	11 (13.3%)	0.247
	WBC $10^3/\mu\text{L}$; mean $\pm$ SD	18.2 ± 7.4	17.1 ± 7.4	19.7 ± 7.1	0.007
	WBC (mm^3) ≥ 15 k (N, %)	129 (64.1%)	66 (57.9%)	63 (72.4%)	0.038
	Neutrophiles; mean $\pm$ SD	10.9 ± 6.2	9.9 ± 6.1	12.1 ± 6.1	0.008
Physical Examination	CRP mg/dL; mean $\pm$ SD	8.5 ± 15	9.3 ± 18.9	7.4 ± 7.5	0.197
	Lymph node size; mean $\pm$ SD, (median)	3.3 ± 1.7 (3)	2.97 ± 1.6	3.7 ± 1.8	0.005
	Lymph node firm (N, %)	146 (75.3%)	94 (84.7%)	52 (62.7%)	<0.001
	Fluctuation (N, %)	38 (19.6%)	8 (7.2%)	30 (36.1%)	<0.001
	Rubbery (N, %)	10 (5.2%)	9 (8.1%)	1 (1.2%)	<0.001
	Erythema (N, %)	81 (41.8%)	29 (26.1%)	52 (62.7%)	<0.001
Imaging Findings	Tenderness (N, %)	154 (79.4%)	86 (77.5%)	68 (81.9%)	0.319
	Timing from admission; mean $\pm$ SD	1.3 ± 1.1	1.3 ± 0.8	1.3 ± 1.0	0.345
	Lymph node size; mean $\pm$ SD	2.6 ± 1.4	2.6 ± 1.6	2.7 ± 1.1	0.432
	Phlegmon (N, %)	8 (4.1%)	5 (5.8%)	3 (4.3%)	<0.001
	Abscess (N, %)	77 (39.7%)	24 (27.9%)	53 (75.7%)	<0.001
	Abcess (including phlegmon) (N, %)	87 (43.2%)	29 (25.4%)	58 (67.7%)	<0.001
Location of Lymph Node	Size of abscess; mean $\pm$ SD	1.8 ± 1.2	1.3 ± 1.0	2.1 ± 1.1	<0.001
	Lateral (N, %)	37 (19.1%)	20 (18%)	17 (20.5%)	0.244
	Central (N, %)	31 (16%)	22 (19.8%)	9 (10.8%)	0.244
	Submandibular (N, %)	73 (37.6%)	36 (32.4%)	37 (44.6%)	0.244
	Posterior (N, %)	8 (4.1%)	4 (3.6%)	4 (4.8%)	0.244
Hospitalization duration (days); mean $\pm$ SD		4.2 ± 2.7	3.2 ± 1.6	5.6 ± 3.2	<0.001

The median day from the start of the illness was significantly shorter for the conservative treatment group, with 3.9 ± 3.7 days, compared to 5.2 ± 3.6 days in the drainage group ($p = 0.002$). Additionally, pre-hospitalization antibiotic use was reported in 58.2% of cases, with no significant difference between groups.

3.2. Laboratory Features

White blood cell counts and leukocytosis rates were significantly higher in the drainage group compared with the conservative treatment group. ($p = 0.007$) Similarly, neutrophil count was higher in the drainage group ($p = 0.008$). In contrast, CRP levels were similar in both groups.

3.3. Physical Examination and Imaging Findings

Lymph node size was larger in the drainage group compared with the conservative group (3.7 ± 1.8 cm vs. 2.97 ± 1.6 cm, $p = 0.005$). Fluctuation (36.1% vs. 7.2%, $p < 0.001$), erythema (62.7% vs. 26.1%, $p < 0.001$), and lymph node firmness (84.7% vs. 62.7%, $p < 0.001$) were all more common in the drainage group. Imaging findings revealed that abscesses were

present in 75.7% of the drainage group compared to 27.9% in the conservative treatment group ($p < 0.001$).

3.4. Hospitalization Duration

The mean hospitalization duration was significantly longer in the drainage group (5.6 ± 3.2 days) compared with the conservative treatment group (3.2 ± 1.6 days) ($p < 0.001$).

3.5. Microbiological Culture Results

Among the 87 patients who underwent drainage, microbiological culture results were available for 58 patients (see Table 2). The most common pathogen identified was methicillin-susceptible *Staphylococcus aureus* (MSSA), accounting for 35.7% of cases, followed by methicillin-resistant *Staphylococcus aureus* (MRSA) at 21.8%. Atypical mycobacterium and *Haemophilus influenzae* were each identified in 1.8% of cases, with no growth observed in 7% of cultures.

Table 2. Clinical characteristics of children with cervical lymphadenitis who underwent drainage.

Clinical Characteristics		Total N = 87
Mean day of drainage from the start of illness; mean $\pm$ SD		2.7 $\pm$ 4.3
Pus in drainage (N, %)		75 (86.2%)
Microbiological culture results (N = 58)	MSSA	20 (35.7%)
	MRSA	12 (21.8%)
	Group A streptococcus	6 (10.7%)
	Cocci Gram+	6 (10.7%)
	Atypical mycobacterium	1 (1.8%)
	<i>Haemophilus influenzae</i>	1 (1.8%)
	No growth	4 (7%)
	Other	4 (7%)
	No microbiology results	4 (7%)
Complication of disease (N, %)		3 (4%)
Complication from drainage (N, %)		4 (5%)

3.6. Complications

Disease complications occurred in 4% ($N = 4$) of cases, while complications following the drainage procedure itself were reported in 5% of patients. Disease-related complications were documented in three cases, including airway obstruction, jugular vein thrombosis, and sepsis. In contrast, drainage-related complications were reported in four cases, involving marginal mandibular nerve injury, vascular complications, and wound dehiscence. Notably, all complications were temporary and resolved over time without long-term consequences.

3.7. Multivariate Analysis

Multivariate analysis identified several factors significantly associated with the need for drainage (see Table 3). Lymph node size ≥ 3 cm on physical examination (OR 2.93, 95% CI 1.18–7.69, $p = 0.02$), erythema on physical examination (OR 7.03, 95% CI 3.01–17.70, $p < 0.001$), and the presence of an abscess or phlegmon on imaging (OR 4.59, 95% CI 2.03–11.02, $p < 0.001$) were all significantly associated with the likelihood of undergoing a drainage procedure. Both leukocytosis (WBC counts exceeding 15,000/ μ L) and age younger than 2.3 years were associated with the need for a drainage procedure, but these trends did not reach statistical significance.

Table 3. Multivariate analysis of factors associated with drainage procedures in children with cervical lymphadenitis.

Factors	Odds Ratio	95% Confidence Intervals	p-Value
Age $\geq$ 2.3 years	0.88	0.35–2.28	0.8028
Lymph node size $\geq$ 3 (cm)	2.93	1.18–7.69	0.0233
Erythema on physical examination	7.03	3.01–17.70	<0.001
WBC $\geq 15 \times 10^3/\mu\text{L}$	1.40	0.53–3.72	0.4886
US abscess on imaging	4.59	2.03–11.02	<0.001

3.8. Antibiotic Treatment and Duration

Among the 201 pediatric patients with cervical lymphadenitis, 94.5% received antibiotic treatment (Table 4). The use of antibiotics was significantly higher in the surgical drainage group compared to the conservative treatment group (98.9% vs. 91.2%, $p = 0.025$). Amoxicillin-Clavulanate (AMOXI-CLAV) was the most frequently prescribed antibiotic in both groups, with no significant difference in its use ($p = 0.57$). However, cephalosporins (1st/2nd generation) and clindamycin were used more often in patients who required surgical drainage compared to those managed conservatively ($p = 0.0003$ and $p = 0.02$, respectively), suggesting an association with more severe or refractory infections.

Table 4. Antibiotic treatment.

	Conservative Treatment N = 114	Drainage N = 87	p-Value	Total N = 201
Any antibiotic	104 (91.2%)	86 (98.9%)	0.025	190 (94.5%)
Amoxicillin-Clavulanate (AMOXI-CLAV)	98/104 (94.2%)	79/86 (91.9%)	0.57	177/190 (88.1%)
Ceftriaxone	16/104 (15.4%)	18/86 (20.9%)	0.35	34/190 (17.9%)
Cephalosporins 1st/2nd generation	6/104 (5.8%)	21/86 (24.4%)	0.0003	27/190 (14.2%)
Clindamycin	7/104 (6.7%)	15/86 (17.4%)	0.02	22/190 (11.6%)
Metronidazole	4/104 (3.8%)	5/86 (5.7%)	0.73	9/190 (4.7%)
TMP-SMX	1/104 (1.0%)	3/86 (3.5%)	0.33	4/190 (2.1%)
Azithromycin	2/104 (1.9%)	1/86 (1.2%)	1	3/190 (1.6%)
Clarithromycin and rifampin	0/104 (0.0%)	1/86 (1.2%)	0.45	1 (0.5%)
Treatment duration, mean $\pm$ SD (days)	11.0 $\pm$ 3.4	14.8 $\pm$ 6.2	<0.001	12.7 $\pm$ 5.2
<7 days	6/104 (5.8%)	1/86 (1.2%)	0.13	7/190 (3.7%)
7–10 days	56/104 (53.8%)	21/86 (24.4%)	<0.001	77/190 (40.5%)
11–14 days	36/104 (34.6%)	40/86 (46.5%)	0.1	76/190 (40.0%)
>14 days	6/104 (5.8%)	24/86 (27.9%)	<0.001	30/190 (15.8%)

Treatment duration was also significantly longer in the surgical drainage group, with an average of 14.8 $\pm$ 6.2 days compared to 11.0 $\pm$ 3.4 days in the conservative group ($p < 0.001$). Patients requiring surgical intervention were more likely to receive prolonged antibiotic courses, with 27.9% receiving treatment for more than 14 days, compared to only 5.8% in the conservative group ($p < 0.001$). These findings highlight the increased treatment burden in patients with more severe infections requiring surgical management.

4. Discussion

In this retrospective cohort study, we identified several predictors associated with the need for surgical drainage in cases of cervical lymphadenitis. In multivariate analysis, large lymph nodes (>3 cm), erythema upon physical examination, and the presence of abscess or phlegmon on ultrasound were all independent factors for intervention. Additionally, univariate analysis revealed that younger age (<3 years), male sex, and physical examination findings, such as fluctuating or firm nodes and a longer interval between the onset of illness and presentation, were associated with a higher likelihood of intervention. Finally, leukocytosis ($>15,000/\text{mm}^3$) and a high neutrophil count also correlated with increased intervention rates. We also identified differences in the outcome of the two groups, as an extended duration of hospitalization was more frequently observed in the intervention group. Bacterial cultures were obtained for all patients who underwent surgical drainage. MSSA was the most common pathogen, accounting for 35% of abscesses, while MRSA was present in 21% of cases. The predominance of *Staphylococcus aureus* in superficial suppurative lymphadenitis aligns with previous studies; however, the proportion of MRSA reported in some studies appears notably lower than in our cohort [16,17]. In our study, MRSA accounted for more than 37% of *S. aureus* isolates in abscess-forming infections requiring drainage, suggesting potential regional or institutional differences in resistance patterns that warrant further investigation. Beyond its role in direct pus evacuation, puncture drainage serves another critical function: the identification of the causative organism, which enables targeted antimicrobial therapy. This aspect is essential for optimizing treatment decisions, particularly in the context of antibiotic resistance and ensuring appropriate pathogen-directed therapy.

In children under 3 years old with cervical lymphadenitis, physical examination findings, such as lymph nodes larger than 3 cm, along with erythema and fluctuation, are strong predictors for surgical intervention. Sauer et al. reported similar findings in a large study of 768 patients, identifying fluctuation, age under 4 years, and prior antibiotic use as factors leading to abscesses requiring surgical drainage [10]. Kimia et al. also noted that younger age (<3 years) and lymph node size over 3 cm, along with fluctuation, predicted the need for drainage, though erythema was not identified as a risk factor [1]. Alcalay's review of 383 pediatric patients found that 81.4% and 100% of those undergoing needle aspiration and open lymph node drainage, respectively, had erythema on physical examination [18]. Other clinical factors such as fever, infection location, and prior antibiotic treatment have been discussed in various studies [11,19]. However, signs of an inflamed, enlarged node in young children remain the most consistent and significant indicators for drainage and can help guide initial management.

The role of leukocytosis as a predictor remains debated. Several studies [10,20,21] suggested that inflammatory markers are not essential for evaluating acute lymphadenitis, while others [1] argue that an elevated WBC count is a strong independent predictor [1]. Our findings support the latter for WBC counts over $15,000/\text{mm}^3$, although this was not identified as an independent predictor in a multivariate analysis for drainable suppurative adenitis. Other inflammatory markers, such as C-reactive protein (CRP), procalcitonin, and erythrocyte sedimentation rate (ESR), are frequently abnormal but lack specificity [21,22].

Ultrasonography (US) is the preferred imaging modality for cervical lymphadenitis in the pediatric population due to its ability to be performed without sedation and the absence of radiation exposure [23,24]. Of the 146 patients in our study who underwent US, 8 also had CT scans. The detection of phlegmon and abscess in US was a strong predictor for surgical drainage, consistent with findings from previous studies [10,19–21]. However, the timing of US imaging can present a limitation; Desai et al. noted that earlier imaging may increase the likelihood of recurrence and result in higher drainage rates [25]. In our

cohort, the timing of imaging did not show a statistically significant difference between the groups.

Our findings could potentially improve decision-making when considering surgical intervention in children with cervical lymphadenitis. As some of the predictors align with previous studies, we recognize that early clinical presentation is the most significant factor in guiding clinical management. We humbly propose the following assessment strategy: For children under 3 years old presenting with one or more of the following predictors: (1) lymphadenitis > 3 cm on physical examination, (2) erythema and/or fluctuation, or (3) leukocytosis > 15,000/mm³—we recommend early ultrasound imaging and surgical drainage if phlegmon or abscess is detected. For children under 3 years old without these predictors, intravenous antibiotic treatment followed by reassessment and ultrasound within 48 h is advised. For older patients (>3 years), we suggest primary conservative treatment with oral antibiotics for 48 h and subsequent reassessment. Empirical antibiotic therapy should target *Staphylococcus aureus*, with MRSA coverage based on local prevalence and resistance patterns. In any age group, if the patient's condition worsens during treatment, US imaging should be performed, and surgical intervention should be strongly considered. Hospitalization for monitoring and early intervention is recommended for patients with at least one predictor and younger age or two predictors if older than 3 years.

Our results indicate that surgical drainage in pediatric cervical lymphadenitis is associated with increased antibiotic use, particularly first- and second-generation cephalosporins and clindamycin, as well as prolonged treatment durations. This suggests that surgical intervention is more commonly performed in severe or refractory cases, necessitating broader-spectrum antibiotics and extended therapy. Additionally, the relationship between abscess depth, drainage, and treatment duration warrants further consideration. Similarly to previous reports, we observed that superficial abscesses requiring drainage were associated with longer antibiotic courses, likely reflecting more severe infections or a delayed response to treatment [26,27]. In contrast, studies have suggested that in deep abscesses, timely and adequate drainage may facilitate faster resolution, potentially reducing the need for prolonged antibiotic therapy [20,28]. These findings emphasize the importance of early risk stratification and optimized management strategies in pediatric cervical lymphadenitis.

We acknowledge several limitations. First, this is a single-center, retrospective study, which was chosen due to ethical challenges in conducting a prospective intervention comparison study. Additionally, a retrospective design allowed us to follow the cohort over several years and assess the long-term outcomes of the physician's decisions to treat conservatively or proceed with drainage. Our cohort includes over 201 children, comparable to previous studies in this field.

In conclusion, our retrospective cohort study identified several predictors for surgical drainage in cervical lymphadenitis, including lymph node size, erythema, leukocytosis, and ultrasound findings of abscess or phlegmon. These predictors align with previous research and highlight the importance of early clinical assessment in guiding treatment decisions. We recommend a management strategy based on these predictors, advocating for early ultrasound imaging and surgical intervention, when necessary, particularly in children < 3 years old.

Author Contributions: Conceptualization, Z.H.P. and O.Z.; methodology, C.H., M.S. (Mona Saif) and S.B.-S.; software, M.S. (Moshe Shmueli); validation, S.B.-S., Z.H.P. and O.Z.; formal analysis, M.S. (Moshe Shmueli); investigation, C.H., M.S. (Mona Saif) and S.B.-S.; resources, O.Z. and Z.H.P.; data curation, M.S. (Moshe Shmueli) and C.H.; writing—original draft preparation, M.S. (Mona Saif) and C.H.; writing—review and editing, M.S. (Mona Saif), C.H., M.S. (Moshe Shmueli) and O.Z.; visualization, D.Y.; supervision, Z.H.P. and O.Z.; project administration, O.Z. and Z.H.P. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: This project has been approved by the ethics committee of the Soroka University Medical Center (SUMC, 0046-22-SOR) on 11 April 2022.

Informed Consent Statement: Patient consent was waived due to the retrospective nature of the study. This waiver was granted by the ethics committee, as the research involved the analysis of pre-existing, de-identified data. No identifiable patient information is included in this manuscript.

Data Availability Statement: The data presented in this study are available on request from the corresponding author due to privacy and ethical restrictions, as the dataset contains sensitive patient information that cannot be shared publicly.

Conflicts of Interest: The authors declare no conflicts of interest.

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