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Complete Surgical Excision of Cervicofacial Nontuberculous Mycobacterial Lymphadenitis in Children

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Highlights

What are the main findings?

- Most children presented after a diagnostic delay, often with subcutaneous infiltration or fistulization, and NTM was microbiologically documented in most cases.
- Complete surgical excision achieved excellent local control, with no recurrence at the operated site and predominantly transient lower-lip asymmetry as the main postoperative complication.

What are the implications of the main findings?

- Early recognition, structured microbiological work-up, and timely referral may shorten diagnostic delay and improve treatment planning.
- In appropriately selected children, complete surgical excision is an effective option when performed in experienced centers.

Abstract

Background: Nontuberculous mycobacterial (NTM) cervical lymphadenitis is an uncommon but clinically challenging pediatric condition that often mimics other causes of neck masses and is therefore frequently misdiagnosed or mistreated. This study aimed to describe the diagnostic work-up, surgical management, complications, and outcomes of complete surgical excision in children with cervicofacial necrotizing granulomatous lymphadenitis consistent with NTM disease. **Methods:** We retrospectively analyzed 70 children (48 girls and 22 boys; mean age, 4 years) who underwent surgery between 2010 and 2023. Clinical presentation, diagnostic work-up, microbiological findings, extent of surgery, follow-up, and outcomes were reviewed. **Results:** Most children presented with advanced disease, including fistulization in 32/70 (46%) and subcutaneous infiltration in 23/70 (33%). The median interval between first observation and surgery was 12 weeks (IQR, 9–21). NTM was microbiologically confirmed in 58 children; the remaining 12 were classified as presumptive NTM cases on the basis of typical clinical–anatomic features, necrotizing granulomatous histopathology, and exclusion of alternative causes. Interferon-gamma release assay was negative in all 39 tested children, whereas purified protein derivative skin testing was positive in 7/34 (21%). Among the 64 children who underwent the full institutional microbiological work-up, the overall diagnostic yield reached 58/64 (91%), and *Mycobacterium avium* was the predominant isolate. Surgical treatment ranged from single-level excision to multilevel dissection and/or parotidectomy. Postoperative lower-lip asymmetry occurred in 27/51 (53%) children undergoing parotid or level I surgery and persisted beyond

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3 months in 7; four of these seven recovered by 12 months, while three had barely perceptible dynamic asymmetry at their last clinical assessment. Clinical follow-up lasted 2 years; the interval to final telephone contact about subsequent lymphadenopathy ranged from 2 to 16 years (mean, 8 years). No recurrence at the operated site was reported, and one metachronous parotid lesion was successfully treated. **Conclusions:** Pediatric NTM cervical lymphadenitis often presents late, with advanced local disease. In this selected surgical cohort, complete surgical excision provided excellent long-term local control, although postoperative lower-lip asymmetry was common after surgery close to the marginal mandibular branch, and minimal residual asymmetry was observed in three patients. Early recognition, microbiological confirmation when feasible, and referral to experienced centers are essential for optimal management.

Keywords: nontuberculous mycobacterial lymphadenitis; children; surgical excision

1. Introduction

Nontuberculous mycobacterial (NTM) cervicofacial lymphadenitis is a relatively uncommon condition that mainly affects otherwise healthy children younger than 5 years [1]. Its incidence appears to have increased in recent decades, reaching up to 4.5 cases per 100,000 children per year in some series [2]. This increase has been linked, at least in part, to the discontinuation of BCG vaccination in several European countries [3,4]. Cervicofacial disease is the most common presentation because inoculation is believed to occur mainly through the oral cavity, often via hand-to-mouth contact [5]. Although more than 170 NTM species are present in the environment, only a limited number are typically implicated in pediatric lymphadenitis, most commonly members of the Mycobacterium avium complex [6,7]. Other routes of entry, including skin abrasions, dentition, and nosocomial spread related to surgery or indwelling devices, have also been described [5].

The clinical course is usually insidious and has been described in 4 phases: an initial painless swelling, subsequent central necrosis with extension beyond the affected lymph node, skin discoloration and violaceous marbling as the dermis becomes involved, and finally spontaneous fistulization [8]. Although the inflammatory process may eventually be self-limiting, progression to advanced local disease is common before the diagnosis is established [6].

Early diagnosis would clearly be desirable, but this remains difficult in routine practice. Available diagnostic tests often require several weeks to provide a definitive answer, and reported times to diagnosis range from 8 to 12 weeks to as long as 30 weeks, by which time many children have already reached the third or fourth clinical stage. As a result, treatment is frequently started based on clinical suspicion alone, without microbiological confirmation [9].

Treatment selection remains controversial. Complete excision can provide rapid and definitive local control, but it carries a risk of facial nerve morbidity [5,6,10–12]. Limited surgery or curettage may reduce nerve-related risk in selected cases, but healing is often slower, and additional procedures may be required [6,10,11]. Observation and/or antibiotic therapy may be reasonable alternatives in selected patients, yet resolution is often prolonged, and cosmetic sequelae remain possible [3,5,12–15].

The objective of this study was to describe the diagnostic work-up, microbiological yield, extent of surgery, complications, follow-up, and outcomes of a consecutive series of children with cervicofacial necrotizing granulomatous lymphadenitis managed with complete surgical excision at a tertiary pediatric otolaryngology center.

2. Materials and Methods

We retrospectively reviewed the charts of all children who underwent surgery for cervicofacial lymphadenitis between 2010 and 2023 and whose histopathological diagnosis was necrotizing granulomatous lymphadenitis. Cases were classified as microbiologically confirmed NTM when NTM was identified by culture and/or acid-fast bacilli on fine-needle aspiration or on the surgical specimen. Cases without microbiological confirmation were classified as presumptive NTM when all of the following were present: necrotizing granulomatous histopathology, a typical cervicofacial clinical–anatomic presentation and evolution, and exclusion of alternative causes of granulomatous lymphadenitis. The diagnostic work-up included serologic testing for cytomegalovirus, *Epstein–Barr virus*, *Toxoplasma gondii*, *Bartonella* spp., and *Borrelia* spp.; purified protein derivative skin testing; interferon-gamma release assay; fine-needle aspiration with culture and direct microscopic examination; and imaging. Ultrasonography was the preferred imaging modality. Magnetic resonance imaging (MRI) was used when ultrasonography suggested possible vascular or nerve involvement, parapharyngeal/retropharyngeal extension, or poorly defined deep disease; computed tomography (CT) was used in one child with suspected retropharyngeal abscess.

The extent of surgery was determined by preoperative imaging and refined intraoperatively according to the actual nodal and soft-tissue extent of disease, with the aim of complete removal of all macroscopically involved tissue while preserving the facial nerve and other critical structures whenever possible. Procedures were performed by five surgeons from the pediatric otolaryngology team. Intraoperative facial nerve monitoring was introduced in 2014. Among the 51 children undergoing parotidectomy or level I dissection, monitoring was used in 40 procedures and was not used in 11. Rehabilitative physiotherapy exercises were offered to all children who developed postoperative lower-lip asymmetry. Postoperative clinical examinations, including assessment of lower-lip movement and inspection of surgical scars, and ultrasonography were performed during the first 2 years; routine clinical follow-up ended thereafter. At study completion, telephone contact was used solely to inquire about subsequent cervicofacial lymphadenopathy in patients no longer attending the institution and was not used to evaluate facial nerve function or cosmetic outcomes. Recurrence was defined as reappearance of disease at the previously operated site after complete healing. During the first 2 years, this outcome was assessed by clinical examination and/or ultrasonography; later events were ascertained by patient or caregiver report during telephone contact. Statistical analyses were performed using jamovi version 2.6 (The jamovi Project Pty Ltd, Sydney, NSW, Australia). The analysis was primarily descriptive. Two exploratory categorical comparisons were performed in the subgroup of 51 children undergoing parotidectomy or level I dissection: temporary lower-lip asymmetry according to (1) skin status at presentation (infiltrated/fistulized skin vs. normal overlying skin) and (2) extent of surgery (multilevel dissection vs. single-level dissection/parotidectomy only). Pearson's chi-squared test was used when expected cell counts were adequate; Fisher's exact test was used otherwise. An additional post hoc exploratory comparison of postoperative lower-lip asymmetry according to the actual use of intraoperative facial nerve monitoring (with vs. without monitoring) was performed using Fisher's exact test. Two-sided p values < 0.05 were considered statistically significant. All subgroup analyses were considered exploratory.

3. Results

Seventy children were included: 48 girls and 22 boys, with a mean age of 4 years; 13% were older than 5 years (Table 1). The median interval between first observation and surgery was 12 weeks (IQR, 9–21). Five children underwent surgery 1–2 years after unsuccessful

antibiotic treatment at another institution, and 1 child was referred for persistent supraclavicular disease after 2 previous operations performed elsewhere. At presentation, 15 children had a neck mass with normal overlying skin, 23 had infiltration of the subcutaneous tissues, and 32 had fistulization, including 3 with extensive necrosis. Preoperative marginal facial nerve weakness and recurrent laryngeal nerve paralysis were each present in 1 child.

Table 1. Summary of cohort characteristics, diagnostic findings, treatment, and outcomes (overall cohort, $n = 70$; subgroup denominators specified).

Characteristic	Value
Patients, n	70
Female sex	48/70 (69%)
Mean age	4 years
Age > 5 years	13%
Median time from first observation to surgery	12 weeks (IQR, 9–21)
Presentation with normal overlying skin	15/70 (21%)
Presentation with subcutaneous infiltration	23/70 (33%)
Presentation with fistulization	32/70 (46%)
Microbiologically confirmed NTM	58/70 (83%)
Presumptive NTM cases	12/70 (17%)
Children with full institutional microbiological work-up	64/70 (91%)
Positive purified protein derivative skin test	7/34 (21%)
Negative interferon-gamma release assay	39/39 (100%)
Preoperative FNA identifying NTM/acid-fast bacilli	49/64 (77%)
Overall institutional diagnostic yield	58/64 (91%)
Predominant species	*Mycobacterium avium* (48 confirmed cases)
Parotid involvement	12/70 (17%)
More than one lymph node level excised	45/70 (64%)
Postoperative lower-lip asymmetry after parotid or level I surgery	27/51 (53%)
Lower-lip asymmetry persisting > 3 months	7/51 (14%)
Barely perceptible residual dynamic lower-lip asymmetry at last clinical assessment	3/51 (6%)
Hypertrophic scar	3/70 (4%)
Frey syndrome after parotidectomy	1/12 (8%)
Clinical follow-up/interval to final telephone contact	2 years/2–16 years (mean, 8 years)
Recurrence at the operated site (clinical assessment and later telephone report)	0
Metachronous parotid localization	1/70 (1%)

Unless otherwise indicated, percentages refer to the overall cohort ($n = 70$). The institutional diagnostic work-up involved 64 children; test-specific denominators reflect the numbers tested. Lower-lip outcomes refer to the 51 children undergoing parotid or level I surgery, and Frey syndrome is calculated among 12 parotidectomies. Facial nerve function and scar status were examined clinically for up to 2 years; longer-term telephone contact concerned subsequent lymphadenopathy only. Legends: IQR, Interquartile range, NTM, Nontuberculous mycobacterial.

Overall, 58 of the 70 children (83%) had microbiologically confirmed NTM disease. The remaining 12 children were classified as presumptive NTM cases because they had

necrotizing granulomatous lymphadenitis on histopathology, the typical cervicofacial pattern and clinical course of NTM disease, and no alternative diagnosis after the investigations described above. Of the 70 children, 64 were initially evaluated at our institution and underwent the full preoperative microbiological pathway; the remaining 6 were referred after prior treatment elsewhere and were therefore not included in the calculation of institutional preoperative diagnostic yield.

Serologic testing for alternative infectious causes of granulomatous lymphadenitis was negative in all patients. PPD skin testing was performed in 34 children and was positive in 7 (21%). IGRA was performed in 39 children and was negative in all of them, including those with a positive PPD result.

Fine-needle aspiration was performed in all 64 children initially evaluated at our institution. Culture identified NTM in 48 patients (75%): *Mycobacterium avium* in 43, *M. intracellulare* in 3, and *M. chimaerae* and *M. abscessus* in 1 patient each. Acid-fast bacilli were detected in 1 additional case, yielding a preoperative diagnostic rate of 77%.

All children underwent ultrasonography. One child also underwent CT, and 6 underwent MRI to better define the extent of disease for surgical planning.

The clinical epicenter of disease was level I in 38 children; level II in 19; the parotid region in 12; and levels III, IV, or V in 1 child each. Surgical excision involved a single lymph node level in 19 children or the parotid gland alone in 6, 2 levels in 21, 3 levels in 11, 4 levels in 8, 5 levels in 3, and 6 levels in 2. Bilateral disease was present in 2 children. Overall, the parotid gland was involved in 12 cases, level I in 42, level II in 44, level III in 28, level IV in 5, level V in 23, level VI with mediastinal extension in 1, and the retropharyngeal nodes in 2.

Culture of the surgical specimen identified NTM in 6 additional cases (*M. avium* in 5 and *M. malmoense* in 1). Acid-fast bacilli were detected in 3 further surgical specimens. Overall, mycobacteria were documented in 58 of the 64 children evaluated at our institution, corresponding to an overall diagnostic yield of 91%.

The main postoperative complication was slight dynamic asymmetry of the lower lip, observed in 27 of 51 children (53%) who underwent parotidectomy or level I dissection. Within this subgroup, 44 children had infiltrated or fistulized overlying skin, and 7 had normal overlying skin; 27 underwent multilevel dissection, and 24 underwent single-level dissection or parotidectomy only. Exploratory categorical analyses are summarized in Table 2. Postoperative lower-lip asymmetry was not significantly associated with skin status at presentation (24/44 [54.5%] in children with infiltrated/fistulized skin vs. 3/7 [42.9%] in children with normal overlying skin; Fisher's exact test, $p = 0.693$) or with extent of surgery (15/27 [55.6%] after multilevel dissection vs. 12/24 [50.0%] after single-level dissection/parotidectomy only; Pearson's chi-squared test, $\chi^2 = 0.157$, $p = 0.692$). Asymmetry persisted beyond 3 months in 7 children (7/51, 14%), all of whom underwent surgery with monitoring. Four of the seven had recovered by 12 months; the remaining three had barely perceptible dynamic lower-lip asymmetry at their last clinical assessment during the 2-year clinical follow-up. Postoperative asymmetry occurred in 23/40 monitored patients (57.5%) and 4/11 unmonitored patients (36.4%; Fisher's exact test, $p = 0.310$). Rehabilitative physiotherapy exercises were offered to all 27 children with postoperative asymmetry. The three patients with residual asymmetry had undergone procedures performed by junior surgeons; their residual deficits were functionally and cosmetically acceptable at the last clinical examination. Surgeon-specific complication rates were not evaluated. Other complications were uncommon and included hypertrophic scarring in 3 children and Frey's syndrome in 1 of the 12 who underwent parotidectomy.

Clinical follow-up with outpatient examinations and ultrasonography lasted 2 years. At the end of the study, telephone contact was used only to ascertain whether new cervicofacial lymphadenopathy had occurred after discharge from routine follow-up. The interval

from surgery to this long-term contact ranged from 2 to 16 years (mean, 8 years). Key descriptive findings are summarized in Table 1, and the exploratory categorical comparisons are reported in Table 2. No recurrence at the operated site was documented during clinical follow-up or reported at the subsequent telephone contact. One child with initial level I and level II disease developed a parotid localization 1 year later and was successfully treated with parotidectomy without complications.

Table 2. Exploratory categorical analyses in the subgroup of children undergoing parotidectomy or level I dissection ($n = 51$).

Variable	No Asymmetry, *n* (%)	Asymmetry, *n* (%)	Total, *n* (%)	Statistical Test	Test Statistic	*p* Value
Skin status at presentation						
Infiltrated/fistulized skin	20 (45.5)	24 (54.5)	44 (100)	Fisher's exact test	—	0.693
Normal overlying skin	4 (57.1)	3 (42.9)	7 (100)			
Extent of surgery						
Multilevel dissection	12 (44.4)	15 (55.6)	27 (100)	Pearson's chi-squared test	$\chi^2 = 0.157$	0.692
Single-level dissection/ parotidectomy only	12 (50.0)	12 (50.0)	24 (100)			

Percentages in this table are calculated within the subgroup of children undergoing parotidectomy or level I dissection ($n = 51$), not within the full cohort of 70 children described in Table 1.

4. Discussion

NTM cervicofacial lymphadenitis remains an uncommon but clinically important pediatric condition because it frequently mimics other causes of persistent unilateral neck swelling and is often recognized only after progression to skin involvement [16]. In our series, most children already had subcutaneous infiltration or fistulization at presentation, indicating that delayed recognition remains common in routine practice. This finding is clinically relevant, as advanced local disease may complicate both diagnosis and surgical management.

Ultrasonography remains central to the initial assessment of these patients. Previous studies have described polylobulated or polypoid nodes, intranodal cystic necrosis, and extension of hypoechoic changes into adjacent soft tissues as suggestive findings [17,18]. However, these features are not sufficiently specific to establish the diagnosis in isolation, and imaging must therefore be interpreted together with the clinical course and microbiological investigations [16]. In our cohort, ultrasonography was systematically used as the first-line imaging modality, whereas MRI and CT were reserved for selected cases with suspected deep extension or unclear anatomic relationships. This stepwise approach appears appropriate in view of the disease pattern observed in our patients.

Our findings also support the value of a structured diagnostic pathway. Fine-needle aspiration with culture and direct microscopy identified NTM preoperatively in 77% of the children who underwent the full institutional work-up, and examination of the surgical specimen increased the institutional diagnostic yield to 91%. These figures confirm the practical usefulness of aspiration-based microbiological testing in routine care. At the same time, 12 children in the overall cohort remained microbiologically unconfirmed and were classified as presumptive NTM cases on the basis of typical clinical–anatomic presentation, necrotizing granulomatous histopathology, and exclusion of alternative causes. This reflects the reality of pediatric cervicofacial NTM disease, in which microbiological confirmation is not always achieved despite a highly suggestive overall picture. Nevertheless, the inclusion of presumptive cases remains a limitation and introduces some risk of misclassification.

The demographic and microbiological features of our cohort were consistent with the known epidemiology of the disease. Most children were younger than 5 years, and Mycobacterium avium was the predominant isolate. These findings are in line with previous pediatric series and support the view that cervicofacial NTM lymphadenitis is primarily a disease of otherwise healthy preschool children.

Several retrospective pediatric series have already reported on cervicofacial NTM lymphadenitis, although with different inclusion criteria, treatment strategies, and outcome measures. Leow et al. described a tertiary-center 10-year retrospective cohort that confirmed the typical age distribution, the predominance of *Mycobacterium avium* complex, and the practical difficulties of microbiological diagnosis and treatment selection [2]. Le Naour et al. likewise reported a retrospective pediatric cohort emphasizing the heterogeneity of presentation and management in routine practice [4]. Mennes et al. focused more specifically on treatment comparison and found that complete excision was associated with more rapid resolution, whereas conservative approaches were more often followed by prolonged healing and additional treatment [6]. Willemse et al. examined long-term surgical and esthetic outcomes, highlighting that favorable disease control must also be weighed against functional and cosmetic sequelae [1,15]. Our findings are broadly consistent with these previous reports in showing preschool-age predominance, frequent advanced local disease at presentation, and high local control after surgery. Compared with the published retrospective literature, our study provides complementary original single-center data from a relatively large surgically treated cohort managed with a consistent complete-excision strategy, with particular emphasis on disease extent, microbiological confirmation, transient lower-lip asymmetry in the subgroup at risk, and long-term local control over a mean available follow-up of 8 years.

Diagnostic delay was substantial in our cohort. The median interval between first observation and surgery was 12 weeks, and several children had undergone prolonged unsuccessful treatment elsewhere before referral. This pattern is consistent with the indolent clinical course described in the literature and probably contributed to the high frequency of skin involvement and multilevel disease in our cohort [8,9]. In this respect, our data reinforce a recurring message from previous studies: once violaceous skin changes, fluctuation, or fistulization develop, the disease has usually already progressed beyond the earliest stage, and both definitive diagnosis and local treatment become more demanding.

Within the limits of a retrospective, non-comparative study, complete surgical excision proved to be an effective treatment option in this selected surgical cohort. No recurrence occurred at the operated site during follow-up, which ranged from 2 to 16 years, and only 1 child developed a metachronous parotid localization that was treated successfully. These findings are compatible with prior reports showing high control rates after complete excision, especially when compared with more limited surgery or prolonged conservative management [6,10–13]. At the same time, our results should not be interpreted as proof of superiority over all non-surgical strategies, since our study was not designed for direct treatment comparison and included only children selected for surgical management.

Our series also shows that the clinically apparent epicenter may underestimate the true extent of disease. Although level I, level II, and the parotid region were the most common sites of origin, multilevel surgery was required in many children. This observation has practical implications. First, it supports systematic preoperative ultrasonography in all suspected cases. Second, it justifies the selective use of MRI or CT when deep extension, retropharyngeal or parapharyngeal involvement, mediastinal spread, or uncertain relationships with vessels and nerves are suspected. Third, it suggests that delayed referral may allow a process that appears initially limited to progress into a more extensive cervicofacial disease pattern.

The main functional morbidity of surgery in our cohort was postoperative lower-lip asymmetry after parotidectomy or level I dissection. Although relatively frequent immediately after surgery, it was usually mild. Of the seven children with asymmetry beyond 3 months, four recovered by 12 months, whereas three retained only barely perceptible dynamic asymmetry at the last clinical examination within the 2-year follow-up. These minimal residual findings were functionally and cosmetically acceptable at the last clinical examination. Rehabilitative physiotherapy exercises were offered to all children with postoperative asymmetry; the study did not evaluate the effectiveness of rehabilitation. Importantly, this outcome was assessed in the subgroup of 51 children undergoing procedures at highest risk for marginal mandibular branch dysfunction. Within that subgroup, no statistically significant association was found between postoperative asymmetry and either skin status at presentation or extent of surgery. However, these exploratory analyses had limited power, particularly because only seven patients had normal overlying skin. Their nonsignificant results should not be interpreted as demonstrating equivalence or excluding clinically important associations. We believe the observed rate reflects the advanced stage of disease in many referred cases, the proximity of dissection to the marginal mandibular branch, and the fact that we documented even subtle dynamic weakness. In a further exploratory comparison, lower-lip asymmetry occurred in 23/40 monitored and 4/11 unmonitored procedures, without a statistically significant difference. The study was not designed to evaluate the efficacy of facial nerve monitoring, and nonrandom selection for monitoring, differences in surgical complexity, the small unmonitored group, and involvement of five surgeons limit causal interpretation. The three patients with minimal residual asymmetry had been operated on by junior surgeons; without surgeon-specific denominators and case-mix adjustment, no inference about surgical experience can be drawn. These findings underline the importance of careful preoperative counseling and of treatment in centers experienced in pediatric cervicofacial and parotid surgery.

Alternative strategies should also be considered in a balanced way. Observation, antibiotic therapy, or limited surgery may be appropriate in selected children, particularly when complete excision is anatomically unsafe or not accepted by the family. However, previous studies suggest that these approaches are often associated with longer healing times, more persistent drainage or fistulization, and less predictable cosmetic results [3,6,10–15]. Our study does not resolve this debate, but it supports the view that complete excision can provide excellent local control in carefully selected children when performed in experienced hands.

The clinical applicability of our findings lies mainly in earlier recognition and referral. Children with a persistent unilateral cervicofacial mass, progressive violaceous skin changes, or spontaneous fistulization should undergo prompt ultrasonography and, when feasible, fine-needle aspiration with microbiological analysis. Early referral to a center familiar with pediatric parotid and upper neck surgery may allow treatment before extensive skin involvement develops and may improve both surgical planning and counseling of families.

This study has several limitations. It is retrospective, single-center, and based on a selected surgical population, including referred children and advanced cases. The absence of a contemporaneous non-surgical control group limits causal inference, and the inclusion of presumptive NTM cases may have introduced some misclassification. In addition, exploratory subgroup analyses of postoperative lower-lip asymmetry were underpowered, particularly for the comparison by skin status; lack of statistical significance does not establish equivalence. The nonrandom use of intraoperative facial nerve monitoring and variation between five surgeons further limit comparisons of functional outcomes. Finally, clinical assessment of lower-lip movement and scarring ended after 2 years; subsequent telephone ascertainment concerned new lymphadenopathy only and cannot validate long-term facial function, cosmetic satisfaction, or absence of clinically silent disease. Nevertheless, the

cohort is relatively large for this uncommon condition and was managed with a consistent treatment philosophy over a long period. Overall, our findings support complete surgical excision as an effective option for selected children with cervicofacial NTM lymphadenitis when it can be performed safely in experienced centers.

5. Conclusions

NTM cervical lymphadenitis in children is an indolent but progressive condition that requires a high index of clinical suspicion. A structured diagnostic work-up centered on ultrasonography, fine-needle aspiration, and microbiological analysis can improve diagnostic accuracy. In this selected surgical cohort, complete surgical excision provided excellent long-term local control, with predominantly transient lower-lip asymmetry as the main postoperative morbidity and minimal residual dynamic asymmetry in three children at their last clinical evaluation. Earlier recognition, timely referral, and standardized diagnostic and therapeutic pathways may further improve outcomes.

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