Vilnius University Press

Acta Medica Lituanica
2026. Vol. 33. No 2. Online ahead of print

ISSN 1392-0138 eISSN 2029-4174
DOI: https://doi.org/10.15388/Amed.2026.33.2.22

Sonographic and Radiologic Pitfalls in Pediatric Nasopharyngeal Burkitt Lymphoma Misdiagnosed as Infectious Mononucleosis: A Case-Based Imaging Review

Behar Toçilla*
American Hospital of Tirana, Tirana, Albania
E-mail: behartocilla@yahoo.it

Donjeta Bali
Oncohematology Service, Pediatrics, Department of Pediatrics, FM-UMT; Center Hospital "Mother Teresa" University, Tirana, Albania

Mirzana Kapllanaj
Oncohematology Service, Pediatrics, Department of Pediatrics, FM-UMT; Center Hospital "Mother Teresa" University, Tirana, Albania

Enkeleda Duka
Oncohematology Service, Pediatrics, Department of Pediatrics, FM-UMT; Center Hospital "Mother Teresa" University, Tirana, Albania

Besjana Dibra
Oncohematology Service, Pediatrics, Department of Pediatrics, FM-UMT; Center Hospital "Mother Teresa" University, Tirana, Albania

Mirela Xhafa
Oncohematology Service, Pediatrics, Department of Pediatrics, FM-UMT; Center Hospital "Mother Teresa" University, Tirana, Albania

Abstract. ***Background:*** Pediatric Burkitt lymphoma (BL) is a rapidly proliferating B-cell malignancy that accounts for 30% to 40% of pediatric non-Hodgkin lymphomas [1,2]. It rarely presents as a primary nasopharyngeal mass [3]. Because early clinical and nodal features overlap significantly with viral infectious mononucleosis (IM) or reactive adenotonsillar hyperplasia, initial radiological evaluation plays a pivotal role in preventing life-threatening diagnostic delays [4,5]. We highlight the multimodality imaging spectrum, cross-sectional staging dynamics, and diagnostic pitfalls of nasopharyngeal BL.

Case Presentation: A 15-year-old male presented with fever, cervical lymphadenopathy and progressive nasal obstruction, which was initially managed supportively for suspected infectious mononucleosis [4]. Due to refractory upper airway obstruction, cross-sectional imaging and nasopharyngoscopy were performed, revealing a homogeneous, space-occupying nasopharyngeal mass measuring 4.2 x 3.1 cm with surrounding anatomical compression but without skull-base cortical destruction [3,6]. Ultrasound evaluation confirmed asymmetrical, non-necrotic cervical lymphadenopathy alongside borderline splenomegaly [6]. Histopathological and immunohistochemical analysis confirmed Stage II Burkitt lymphoma (c-MYC positive; Ki-67 ~100%) [1,7]. Whole-body staging CT and serial follow-up ultrasound demonstrated localized Stage II disease without deep abdominal or mediastinal extension, allowing for rapid initiation of chemoimmunotherapy and complete radiological regression [2,8].

Conclusion: Radiologists must recognize key cross-sectional and sonographic discriminators between benign reactive lymphoid hyperplasia (IM) and aggressive mature B-cell lymphoma [5,6]. Unilateral or asymmetrical nasopharyngeal tissue expansion, loss of normal fascial planes, and markedly restricted water diffusion on MRI mandate prompt cross-sectional CT/MRI and endoscopic biopsy [6,9].

Keywords: Burkitt lymphoma, pediatric radiology, nasopharyngeal mass, infectious mononucleosis, computed tomography, ultrasonography, diagnostic pitfall, diffusion restriction.

* Corresponding author

Received: 23/07/2026. **Revised:** 24/08/2026. **Accepted:** 29/08/2026
Copyright © 2026 Behar Toçilla, Donjeta Bali, Mirzana Kapllanaj, Enkeleda Duka, Besjana Dibra, Mirela Xhafa. Published by Vilnius University Press.This is an Open Access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Radiologiniai ir sonografiniai diagnostiniai sunkumai diagnozuojant vaikų nosiaryklės Burkitto limfomą, klaidingai palaikytą infekcine mononukleoze: klinikinio atvejo analitinė apžvalga

Santrauka. ***Įvadas:*** Vaikų nosiaryklės Burkitto limfoma yra reta, tačiau itin agresyvi piktybinė liga, sudaranti 30–40 % vaikų ne Hodžkino limfomų [1, 2]. Dėl būdingų viršutinių kvėpavimo takų obstrukcijos simptomų ir kaklo limfadenopatijos ji dažnai iš pradžių palaikoma infekcine mononukleoze, todėl diagnozė gali vėluoti [4, 5].

Klinikinio atvejo aprašymas: Straipsnyje pristatomas 15 metų paciento, kuriam, įtariant infekcinę mononukleozę, iš pradžių taikytas palaikomasis gydymas, klinikinis atvejis [4]. Kaklo ultragarsinio tyrimo metu nustatyti padidėję limfmazgiai su išlikusia centrine vartų vaskuliarizacija. Dėl progresuojančio kvėpavimo takų užgulimo atlikti kompiuterinės tomografijos ir magnetinio rezonanso tomografijos tyrimai atskleidė nosiaryklę užpildantį 4,2×3,1 cm darinį be kaukolės pamato kaulo destrukcijos [3, 6]. Histopatologinis ir imunohistocheminis tyrimai patvirtino Murphy / St. Jude II stadijos Berkitto limfomą (c-MYC teigiama; Ki-67 ~100 %) [1, 7].

Išvados: Ultragarso ir tomografiniai tyrimai yra labai svarbūs atskiriant piktybinius procesus nuo gerybinių limfoidinių būklių [5, 6]. Atvejo analizė rodo, kad išlikusi limfmazgių vartų struktūra nepaneigia limfomos diagnozės, o simptomų progresavimas įpareigoja skubiai atlikti vaizdinius tyrimus ir biopsiją [6, 8].

Raktažodžiai: Burkitto limfoma, vaikų radiologija, nosiaryklės navikas, infekcinė mononukleozė, kompiuterinė tomografija, ultragarsinis tyrimas, diagnostinė klaida, difuzijos apribojimas.

Introduction

Burkitt Lymphoma (BL) is an extremely aggressive mature B-cell non-Hodgkin lymphoma (NHL) accounting for 30% – 40% of pediatric NHL cases [1,2]. On the grounds of being recognized for having one of the shortest potential doubling times among human tumors (often under 24 hours), BL represents a medical emergency where rapid radiological identification and staging are critical to avoiding life-threatening airway compromise or systemic tumor lysis syndrome [1,8].

In Western populations, sporadic BL predominantly manifests as an abdominal mass involving the ileocecal region [1,3]. Primary extranodal head and neck involvement occurs in fewer than 20% of sporadic pediatric cases, which are most commonly localized to Waldeyer's ring, the jaw, or cervical nodal chains [3,6].

Diagnosis of pediatric nasopharyngeal BL is uniquely challenging because its initial imaging and clinical features closely mimic acute inflammatory or viral conditions, particularly *Epstein-Barr Virus* (EBV)-induced *Infectious Mononucleosis* (IM) and benign adenotonsillar hypertrophy [4,5]. Both conditions present with pharyngeal swelling, soft-tissue enlargement, and cervical lymphadenopathy [4,5].

When acute mononucleosis serology is positive or clinically suspected, clinicians may falsely attribute a worsening upper airway obstruction to viral inflammation, thus delaying cross-sectional imaging [4,5]. Radiologists play a crucial triaging role by identifying atypical cross-sectional patterns, localized mass effect, and sonographic structural abnormalities that distinguish high-grade malignancy from benign reactive lymphoid hyperplasia [6,9].

Here, we present the clinical and radiological account of a 15-year-old adolescent who experienced a diagnostic delay after an initial treatment for presumed infectious mononucleosis before cross-sectional imaging and biopsy confirmed Stage II (according to Murphy / St. Jude Staging System) nasopharyngeal Burkitt lymphoma.

Case Presentation

Clinical History and Diagnostic Pitfall

A 15-year-old male initially presented to primary care with a 2-week history of low-grade fever, sore throat, fatigue, and bilateral upper cervical swelling. Physical examination noted pharyngeal erythema and enlarged cervical lymph nodes (Figure 1). Based on clinical features and the initial serological suspicion, the patient was diagnosed with acute infectious mononucleosis, and was managed supportively [4].

Over the subsequent 3 weeks, while systemic febrile symptoms subsided, the patient developed progressive stertorous breathing, nocturnal snoring, hyponasal speech, and persistent unilateral right-sided nasal obstruction [3,4]. B-symptoms (drenching night sweats and unprovoked weight loss) were absent.

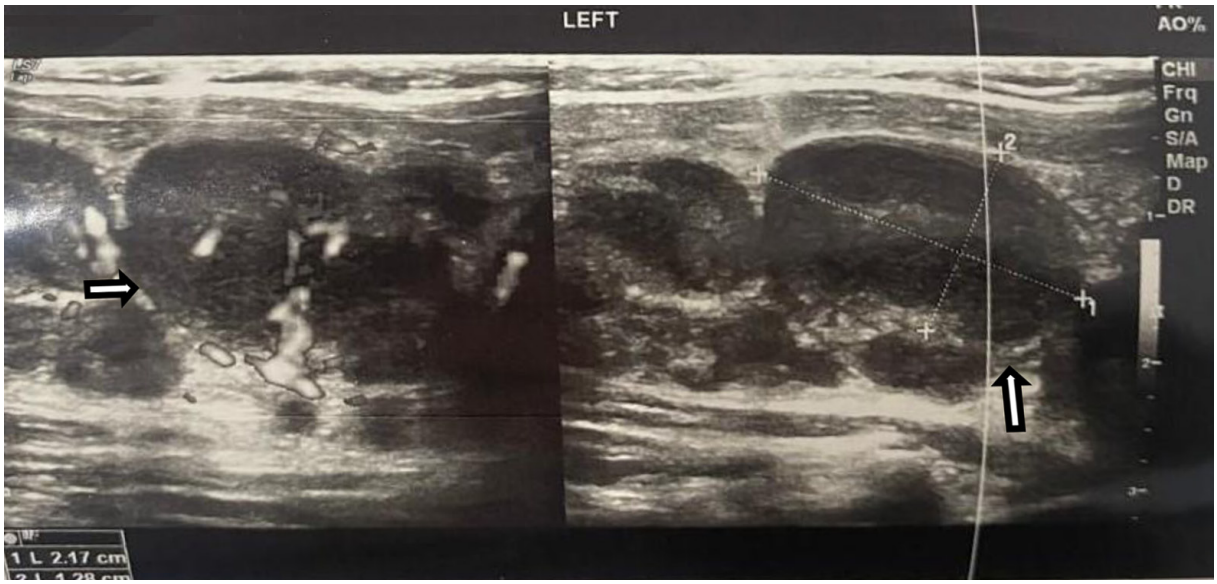


Figure 1. Cervical ultrasound demonstrated left neck lymph node cluster. (A) Left Panel (horizontal arrow – Color Doppler): Demonstrates internal vascularity within a hypoechoic lymph node mass, showing prominent central hilar blood flow. (B) Right Panel (vertical arrow – Grayscale B-Mode): Solitary and adjacent clustered hypoechoic, rounded cervical lymph nodes. Measurement of the largest index node: 2.17 cm in the long-axis diameter (1 L) and 1.28 cm in the short-axis diameter (2 L) (S/A ratio: 0.59). The patient presented with symmetrical, oval cervical nodes and a *preserved central hilar flow* (overlapping with reactive mononucleosis).

Endoscopic and Specialist Evaluation

Due to refractory upper airway obstruction, the patient was referred for otolaryngological evaluation. Nasopharyngoscopy demonstrated a smooth, lobulated, fragile, and highly vascular soft-tissue mass completely occupying the nasopharynx and occluding the posterior choanae [3]. Cranial nerve examination was intact, with no visual changes or facial weakness. Head and neck MRI was performed and confirmed a large nasopharyngeal mass (Figure 2).

Diagnostic Workup, Multimodality Imaging and Staging

Urgent deep tissue biopsy of the nasopharyngeal lesion was performed alongside comprehensive radiological staging and laboratory profiling.

A total-body CT was performed, confirming the nasopharyngeal lesion and excluding involvement of other regions (Figure 3).

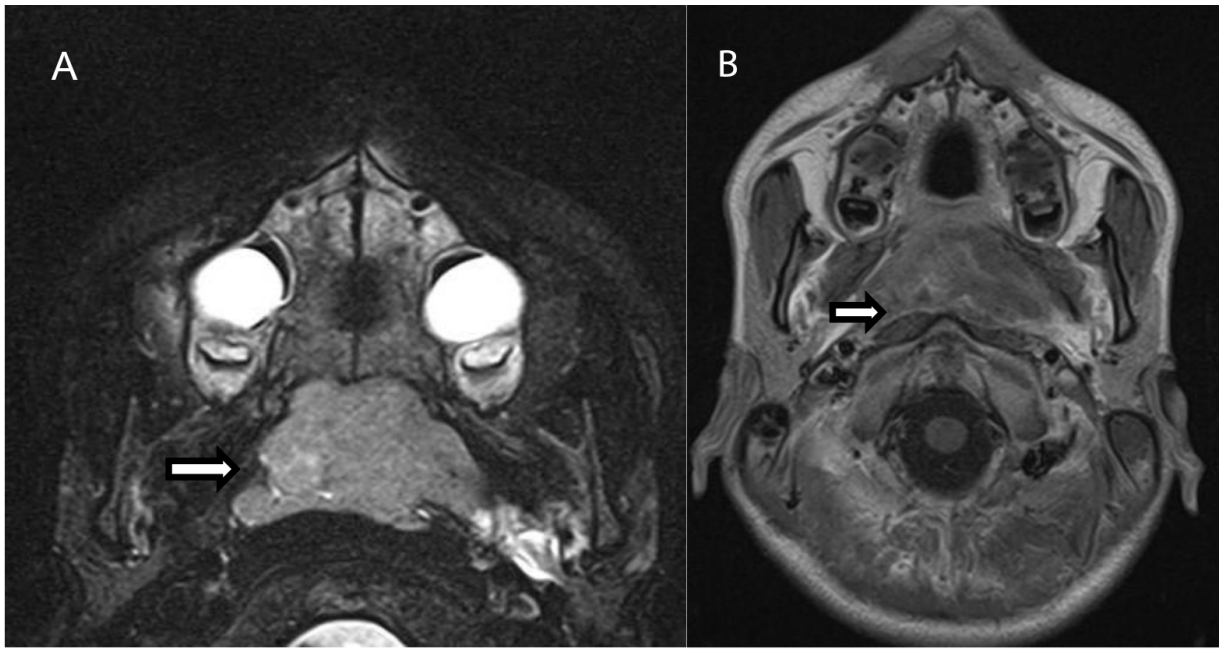


Figure 2. Head and neck MRI of nasopharyngeal Burkitt lymphoma. (A) Axial T2-weighted fat-saturated sequence and (B) axial T1-weighted post-contrast sequence demonstrating a large, lobulated nasopharyngeal soft-tissue mass lateralized to the left, obliterating the Rosenmüller fossae and Eustachian tube openings bilaterally, with anterior extension obstructing the posterior choanae. The mass elicits a low T1 signal relative to adjacent musculature, an intermediate T2/T2-fat-sat signal, and moderate heterogeneous enhancement on post-contrast sequences. Diffusion-Weighted Imaging (DWI) / Apparent Diffusion Coefficient (ADC) mapping was not acquired during initial emergency acquisition due to motion artifacts and protocol constraints.

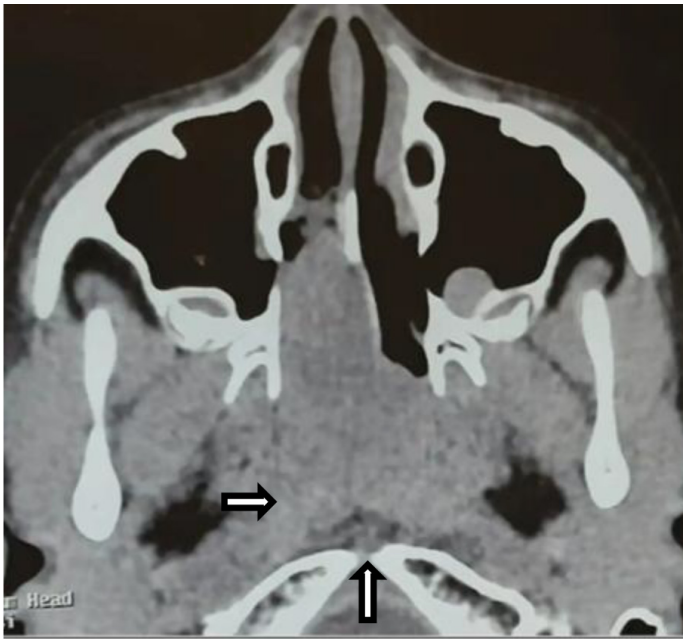


Figure 3. Nasopharyngeal Burkitt lymphoma. Axial CT demonstrates a bulky, infiltrative nasopharyngeal soft-tissue mass (shown with arrows) with extension into the posterior nasal cavity and a marked narrowing of the nasopharyngeal airway, without significant osseous destruction.

Staging and risk classification:

Clinical and radiological staging was established according to the Murphy / St. Jude Staging System for Pediatric Non-Hodgkin Lymphoma (and cross-referenced with the *International Pediatric Non-Hodgkin Lymphoma Staging System* – IPNHLSS). The patient was categorized as Stage II based on the following specific criteria:

- **Primary extranodal tumor with regional lymph node involvement:** Presence of a single, localized extranodal nasopharyngeal mass (4.2 × 3.1 cm) accompanied strictly by regional ipsilateral cervical lymphadenopathy above the diaphragm.
- **Absence of high-risk / systemic features:** Whole-body contrast-enhanced CT (chest, abdomen, pelvis) ruled out mediastinal disease, deep retroperitoneal/mesenteric masses, gastrointestinal thickening, or paraspinal involvement.
- **No central nervous system or bone marrow involvement:** Preserved peripheral blood cell counts and the absence of neurological deficits or peripheral/marrow blasts excluded Stage III/IV progression. Table 1:

Table 1. Diagnostic and Staging matrix

Evaluation Category	Diagnostic Modality / Parameter	Clinical, Histopathological & Radiological Findings	Diagnostic Significance
Staging System	**Murphy / St. Jude Criteria (IPNHLSS)**	Single extranodal nasopharyngeal mass with regional cervical lymphadenopathy restricted to one side of the diaphragm.	Confirms Stage II localized disease. Rules out Stage III (mediastinal/ abdominal) or Stage IV (CNS/ marrow) disease.
Systemic Imaging	**CT Chest / Abdomen / Pelvis**	No hilar, mediastinal, retroperitoneal, or pelvic lymphadenopathy. Spleen: 128 mm (borderline splenomegaly) without focal lesions.	Excludes widespread sporadic abdominal or thoracic Burkitt lymphoma.
Clinical Designation	**B-Symptom Profile**	Drenching night sweats, weight loss, and systemic fevers absent post-initial viral presentation.	Systemic B-symptoms were clinically absent.

Discussion

Pitfalls in Diagnostic Delay: Infectious Mononucleosis Misattribution vs. True Malignancy

Pediatric nasopharyngeal *Burkitt Lymphoma* (BL) is a rapidly proliferating neoplasm with a tumor doubling time of 24–48 hours. However, the initial presentation frequently masquerades as benign upper respiratory tract conditions, exudative tonsillitis, or *Infectious Mononucleosis* (IM). In the published pediatric cohorts, the primary driver of diagnostic delay (ranging from 3 to 8 weeks) is the overlapping clinical triad of a sore throat, persistent fever, and obstructive upper airway symptoms, often compounded by transient early serological overlap with *Epstein-Barr Virus* (EBV).

In our case, a 5-week delay occurred due to the initial clinical improvement under supportive IM management before rapid anatomical progression prompted cross-sectional imaging. Similar diagnostic delays are well-documented across reported head and neck pediatric BL cases:

- **Lee et al.** [10] described pediatric sinonasal/nasopharyngeal BL presenting as persistent nasal blockage and rhinorrhea, initially managed conservatively for acute rhinosinusitis.
- **Goyal et al**. [11] detailed primary nasopharyngeal BL cases presenting with persistent snoring, hyponasal speech, and upper airway compromise initially misdiagnosed as adenotonsillar hypertrophy.
- **Derinkuyu et al.** [12] emphasized that while reactive EBV lymphadenopathy typically presents as bilateral, symmetrical posterior cervical node enlargement, BL presents as progressive, asymmetric, painless lymphadenopathy that fails to regress post-viral recovery, thus serving as the critical clinical red flag for malignant transformation.

Radiological and Sonographic Discriminators and Expanded Differential Diagnosis

Distinction between high-grade pediatric mature B-cell lymphomas versus acute viral or reactive inflammatory processes relies on identifying the key cross-sectional and sonographic patterns (**Table 2**) [5,6,9]. While acute infectious mononucleosis characteristically produces symmetrical, diffuse pharyngeal edema with preserved fascial planes and reactive lymphadenopathy [4,5], nasopharyngeal Burkitt lymphoma typically manifests as a rapidly expanding, homogeneous, space-occupying mass with marked diffusion restriction on MRI [6,9]. Recognition of these specific multimodality features allows radiologists to raise immediate concern for malignancy and advocate for tissue biopsy, thus minimizing life-threatening delays in initiating chemoimmunotherapy [1,8].

Table 2. Differential Diagnosis Matrix for Pediatric Nasopharyngeal Masses

Entity	Primary Age / Clinical Clues	Cross-Sectional MRI / CT Characteristics	Ultrasound & Doppler Features
Burkitt Lymphoma (BL)	Peak at 5–9 yrs; rapid growth, asymmetric obstruction.	Homogeneous low T1 / intermediate T2; uniform enhancement; tends to preserve the cortical bone without frank osteolysis; literature-reported typical range: (ADC < 0.6–0.8 x 10^{-3} mm^2/s) *.	Plump/rounded cervical nodes (L/S < 1.5), lost fatty hilum, chaotic peripheral/ transcapsular flow.
Infectious Mononucleosis	Adolescents/ children; sore throat, fever, exudative tonsillitis.	Symmetric adenotonsillar enlargement; mucosal hyperenhancement without focal tissue mass or deep muscular invasion.	Symmetrical elongated nodes (L/S > 2), preserved central fatty hilum, central hilar vascularity.
Rhabdomyosarcoma	Peak at 2–5 yrs; nasal obstruction, epistaxis, cranial nerve palsies.	Heterogeneous T2 signal, may demonstrate central necrotic breakdown, variable patchy enhancement, local bone destruction; higher ADC values than BL.	Heterogeneous soft-tissue lesion, irregular vascular networks, localized muscular invasion.
Nasopharyngeal Carcinoma	Peak at 10–18 yrs; EBV (+), neck mass, serous otitis.	Infiltrative mass with early skull-base cortical erosion, petroclival extension, and necrotic lymphadenopathy	Complex necrotic lymph nodes, irregular borders, deep structural invasion.
Juvenile Angiofibroma	Adolescent males; recurrent epistaxis, nasal blockage.	Centered at sphenopalatine foramen; antral bow sign; multiple flow voids with brisk arterial contrast enhancement.	Highly vascular tumor with prominent arterial Doppler signals; non-restricted diffusion.

**Note:* ADC numerical ranges reflect typical values reported in published pediatric radiology literature and represent general imaging tendencies rather than absolute diagnostic cutoffs, as values frequently overlap across cellular pediatric neoplasms.

Differential diagnosis of pediatric nasopharyngeal masses:

Beyond *Infectious Mononucleosis* (IM) and reactive adenotonsillar hyperplasia, the differential diagnosis of a pediatric nasopharyngeal mass encompasses both benign vascular entities and aggressive malignant neoplasms:

- **Pediatric Rhabdomyosarcoma (RMS):** Parameningeal RMS frequently presents in young children as a locally invasive, heterogeneous nasopharyngeal mass. Unlike Burkitt lymphoma (BL) which displays a remarkably homogeneous T2 signal, uniform enhancement, and lack of central necrosis, RMS typically exhibits marked T2 heterogeneity, variable patchy enhancement, internal cystic/necrotic breakdown, and aggressive adjacent destruction of skull-base

bone structures. Furthermore, RMS generally demonstrates higher quantitative ADC values than the severe diffusion restriction which is seen in BL.

- **Pediatric Nasopharyngeal Carcinoma (NPC):** Although rare in children, undifferentiated NPC (WHO Type 3) is strongly associated with EBV. Cross-sectional imaging distinguishes NPC by its prominent tendency toward early aggressive skull-base bone erosion, invasion of the petroclival fissure and masticator space, and extensive nodal necrosis, whereas BL typically moldingly fills adjacent soft-tissue spaces while preserving osseous cortical boundaries.
- **Juvenile Nasopharyngeal Angiofibroma (JNA):** Seen almost exclusively in adolescent males, JNA is a hypervascular benign tumor originating at the sphenopalatine foramen. CT and MRI demonstrate key pathognomonic features, including the 'antral bow sign' (anterior displacement of the posterior maxillary sinus wall) and abundant intra-lesional signal voids with intense arterial enhancement, contrasting sharply with the avascular/moderate enhancement pattern of BL.

Comparative Cross-Sectional and Sonographic Imaging Features

Cross-sectional imaging (CT and MRI) plays a vital role in differentiating pediatric nasopharyngeal BL from other benign and malignant nasopharyngeal masses.

- **Cross-Sectional Signal Dynamics:** In line with the imaging series by *Derinkuyu et al.* [12], pediatric sporadic BL characteristically manifests as a large, homogeneous soft-tissue mass centered in the Waldeyer ring, showing a low-to-intermediate T1 signal, an intermediate T2 signal, and uniform post-contrast enhancement without early central necrosis. A key diagnostic hallmark of BL on cross-sectional imaging is its tendency to expand into and fill adjacent air spaces (e.g., choanae, parapharyngeal spaces) while respecting deep fascial planes and preserving the underlying skull-base cortical bone, contrasting sharply with local osseous erosion typical of *Nasopharyngeal Carcinoma* (NPC) or aggressive sarcomas. In literature, functional *Diffusion-Weighted Imaging* (DWI) and low quantitative *Apparent Diffusion Coefficient* (ADC) (ADC < 0.6–0.8 x 10^{-3} mm^2/s) strongly point to BL.
- **Sonographic Nodal Architecture:** On high-resolution multiparametric ultrasound, reactive infectious mononucleosis lymph nodes maintain an elongated oval configuration (L/S ratio > 2), preserved fatty hilum, and central hilar vascularity on color/power Doppler. Conversely, nodal involvement in BL presents as rounded, plump lymph nodes (L/S < 1.5), complete loss or displacement of the fatty hilum, internal hypoechoic heterogeneity, and chaotic peripheral or transcapsular hypervascularity. The sonographic evaluation of pediatric cervical lymphadenopathy requires careful differentiation between reactive hyperplasia and malignant lymphoproliferative disorders. While advanced Burkitt lymphoma typically presents with chaotic peripheral hypervascularity and hilar loss, early-stage nodal involvement in pediatric cases may present with a preserved hilar architecture and a central flow, as observed in our patient. Consequently, the persistence of a central fatty hilum or an orderly central hilar flow on Doppler ultrasound should not be used as an absolute criterion to exclude pediatric lymphoma when clinical symptoms progress.

Study Limitations and Real-World Clinical Context

While functional Diffusion-Weighted Imaging (DWI) and quantitative Apparent Diffusion Coefficient (ADC) mapping are widely emphasized in the current radiological literature as the primary discriminators for high-grade pediatric mature B-cell lymphoma (typically demonstrating profound restricted diffusion with < 0.6–0.8 x 10^{-3} mm^2), DWI sequences were not acquired during our patient's initial MRI protocol. This reflects a common real-world limitation in emergency pediatric imaging, where functional sequences may be omitted or severely degraded by patient motion.

Nevertheless, as demonstrated in this case, the combination of the anatomical mass effect, absence of central necrosis on post-contrast T1, asymmetric nodal enlargement, and high-resolution ultrasound features provided sufficient diagnostic grounds to mandate prompt endoscopic biopsy and expedite life-saving treatment.

Pathogenetic Insights and Proliferation Dynamics

The defining genetic hallmark of Burkitt lymphoma is the constitutive deregulation of the *MYC* proto-oncogene via chromosomal translocation to immunoglobulin gene loci – most frequently t(8;14)(q24;q32) [1,7]. This genetic alteration drives continuous cell-cycle transition, yielding a Ki-67 proliferation index approaching 100% [1,7]. On imaging, this extreme growth rate manifests as rapid lesion enlargement over days, distinguishing BL from indolent B-cell disorders or slow-growing benign neoplasms [1,6].

Therapeutic Response and Staging Implications

Due to its near-total proliferation rate, pediatric Burkitt lymphoma is exquisitely chemo-sensitive [2,8]. Short-course, dose-intensive multi-agent immunochemotherapy protocols (incorporating cyclophosphamide, vincristine, doxorubicin, high-dose methotrexate, cytarabine, and rituximab) achieve 5-year event-free survival rates exceeding 90% for Stage I/II disease [2,8]. Complete radiological clearance of the nasopharyngeal mass and resolution of lymphadenopathy are routinely observed on follow-up imaging post-treatment [2,6].

SUMMARY BOX: RADIOLOGICAL TEACHING POINTS

- **The Mononucleosis mimic:** Unilateral, rapidly progressive nasopharyngeal mass effect or persistent airway obstruction in a child treated for presumed 'mononucleosis' should immediately trigger cross-sectional imaging (CT/MRI) and otolaryngological evaluation.
- **MRI discriminator:** Literature reports indicate that Burkitt Lymphoma typically demonstrates marked diffusion restriction on DWI, with ADC values frequently ranging between $0.6–0.8 \times 10^{-3}$ mm^2/s due to dense, uniform cellular packing. However, because ADC ranges can overlap with other highly cellular pediatric neoplasms and may not always be available, as in such cases when functional DWI sequences are incomplete or limited by pediatric motion artifacts, the structural mass effect and nodal architecture remain key diagnostic drivers.
- **Homogeneous attenuation and lack of early necrosis:** Unlike infectious abscesses or necrotizing carcinomas, early-stage Burkitt Lymphoma demonstrates uniform enhancement without initial central necrosis.
- **Role of Sonography:** Ultrasonography is ideal for serial non-invasive tracking of nodal dynamics and regression of splenomegaly, avoiding unnecessary repeat radiation exposure in pediatric patients.

Conclusion

Primary nasopharyngeal Burkitt lymphoma represents a critical diagnostic challenge in pediatric imaging due to its radiological and clinical overlap with acute infectious mononucleosis and benign adenotonsillar hypertrophy [4,5].

High-resolution ultrasound and cross-sectional CT/MRI serve as key diagnostic triaging tools [6,9]. While viral mononucleosis typically demonstrates symmetrical pharyngeal lymphoid enlargement and diffuse, reactive cervical node preservation [4,5], Burkitt lymphoma presents as a rapidly expanding, homogeneous, space-occupying mass with a localized mass effect and atypical nodal dynamics [3,6].

When sonographic tracking reveals refractory asymmetrical head and neck masses or persistent organomegaly following a presumed viral illness, radiologists should recommend immediate multi-

planar cross-sectional imaging and tissue biopsy in order to establish an early diagnosis and prevent a rapid airway or systemic compromise [5,6,8].

Author contributions

B. T.: Conceptualization, Methodology, Validation, Formal Analysis, Investigation, Resources, Writing – Original Draft Preparation, Supervision, Project Administration.
D. B.: Conceptualization, Writing – Review & Editing, Visualization.
M. K.: Validation, Writing – Review & Editing.
E. D.: Software.
B. D.: Data Curation, Visualization.
M. X.: Data Curation, Writing – Review & Editing.
All the authors have read and agreed with the final version of the article.

Compliance with Ethics Requirements

The authors declare no conflict of interest regarding this article.
The authors declare that all the procedures and experiments of this study respect the ethical standards in the Helsinki Declaration of 1975, as revised in 2008(5), as well as the national law. Informed consent has been obtained from all the patients included in the study.
No specific funding was provided for this study.

Abbreviations

BL: Burkitt Lymphoma
IM: Infectious Mononucleosis
EBV: Epstein-Barr Virus
CT: Computed Tomography
MRI: Magnetic Resonance Imaging
DWI / ADC: Diffusion-Weighted Imaging / Apparent Diffusion Coefficient
US: Ultrasound / Ultrasonography
LDH: Lactate Dehydrogenase
NHL: Non-Hodgkin Lymphoma

References

1. Swerdlow SH, Campo E, Pileri SA, Harris NL, Stein H, Siebert R, et al. The 2016 revision of the World Health Organization classification of lymphoid neoplasms. *Blood*. 2016;127(20):2375-2390. doi:10.1182/blood-2016-01-643569
2. Cairo MS, Gerrard M, Sposto R, Auperin A, Pinkerton CR, Michon J, et al. Results of a randomized international study of high-risk central nervous system B non-Hodgkin lymphoma and B acute lymphoblastic leukemia in children and adolescents. *Blood*. 2007;109(7):2736-2743. doi:10.1182/blood-2006-07-036665
3. Xuereb G, Borg J, Apap K, Borg C. The snoring 2-year-old boy: a case of primary nasopharyngeal Burkitt's lymphoma. *BMJ Case Rep*. 2020;13(4):e233536. doi:10.1136/bcr-2019-233536
4. Fu XS, Guo LM, Lv K, Wang L, Ran WQ, Tan QT, Wang JR, Liu X. Sonographic appearance of cervical lymphadenopathy due to infectious mononucleosis in children and young adults. *Clin Radiol*. 2014;69(3):239-245. doi:10.1016/j.crad.2013.09.016
5. Dunmire SK, Verghese PS, Balfour HH Jr. Primary Epstein-Barr virus infection. *J Clin Virol*. 2018;102:84-92. doi:10.1016/j.jcv.2018.03.001
6. Kalisz K, Alessandrino F, Beck R, et al. An update on Burkitt lymphoma: a review of pathogenesis and multimodality imaging assessment of disease presentation, treatment response, and recurrence. *Insights Imaging*. 2019;10(1):56. doi:10.1186/s13244-019-0733-7

7. Boerma EG, Siebert R, Kluin PM, Baudis M. Translocations involving 8q24 in Burkitt lymphoma and other malignant lymphomas: a historical review of cytogenetics in the light of todays knowledge. *Leukemia*. 2009;23(2):225-234. doi:10.1038/leu.2008.281
8. Sandlund JT, Martin MG. Non-Hodgkin lymphoma across the pediatric and adolescent and young adult age spectrum. *Hematology Am Soc Hematol Educ Program*. 2016;2016(1):589-597. doi:10.1182/asheducation-2016.1.589
9. Mhlanga J, Alazraki A, Cho SW, Lai H, Nadel H, Pandit-Taskar N, et al. Imaging recommendations in pediatric lymphoma: A COG Diagnostic Imaging Committee/SPR Oncology Committee White Paper. *Pediatr Blood Cancer*. 2023;70 Suppl 4(Suppl 4):e29968. doi:10.1002/pbc.29968
10. Lee DH, Yu MS, Lee BJ. Primary Burkitt's Lymphoma in the Nasal Cavity and Paranasal Sinuses. *Clin Exp Otorhinolaryngol*. 2013;6(3):184-186. doi:10.3342/ceo.2013.6.3.184
11. Rodriguez DP, Orscheln ES, Koch BL. Masses of the nose, nasal cavity, and nasopharynx in children. *RadioGraphics*. 2017;37(6):1704-1730. doi:10.1148/rg.2017170064
12. Derinkuyu BE, Boyunaga O, Oztunali C, Tekkesin F, Damar C, Alimli AG, Okur A. Imaging features of Burkitt lymphoma in pediatric patients. *Diagn Interv Radiol*. 2016;22(1):95-100. doi:10.5152/dir.2015.15211