

Case Report

Concurrent Retropharyngeal and Cervical (Colli) Abscess in a Three-Year-Old Child: Diagnostic Challenges, Multidisciplinary Management, and Favourable Surgical Outcome

Ketut Tadeus Max Nurcahya Pinatih^{1*}, I Gusti Ayu Mahaprani Danastri¹, M. Ayu Damayanthi², Putu Dian Ariyanti Putri³

¹Department of Otorhinolaryngology – Head and Neck Surgery, Faculty of Medicine, Universitas Udayana/Udayana University Hospital, Denpasar, Indonesia

²Department of Otorhinolaryngology – Head and Neck Surgery, Payangan Hospital, Gianyar, Indonesia

³Department of Otorhinolaryngology – Head and Neck Surgery, Faculty of Medicine, Universitas Udayana/Prof. Dr. I.G.N.G. Ngoerah General Hospital, Denpasar, Indonesia

ARTICLE INFO

Article history:

Received: May 30, 2026

Accepted: June 29, 2026

Published: July 31, 2026

Keywords:

Cervical abscess

Child

Deep neck space infection

Incision and drainage

Retropharyngeal abscess

*Corresponding author:

Ketut Tadeus Max Nurcahya Pinatih

E-mail: tadeus.max@unud.ac.id

DOI:

<https://doi.org/10.59345/sjorl.v4i1.300>

ABSTRACT

Background: Retropharyngeal abscess is an uncommon but potentially life-threatening deep neck space infection of early childhood that may compromise the airway and, when it extends into adjacent compartments, endanger the great cervical vessels; its coexistence with a concurrent cervical (colli) abscess and carotid-space involvement in a toddler is rarely documented.

Objective: This report describes the diagnostic reasoning, the multidisciplinary airway-centred management, and the favourable outcome of such a case.

Case presentation: A three-year-old boy presented with a twenty-day history of a progressively enlarging, erythematous left neck swelling and a fourteen-day history of intermittent fever unresponsive to oral antibiotics, followed by vomiting of blood-stained pus. He was febrile with a muffled voice and a tender, warm, non-fluctuant left cervical mass. The leukocyte count was elevated and haemoglobin mildly reduced. Contrast-enhanced computed tomography showed a rim-enhancing retropharyngeal collection extending to the carotid space and left neck, abutting the left carotid artery and displacing the trachea, with cervical lymphadenopathy, pan-sinusitis, and pneumonia. After two negative SARS-CoV-2 tests, incision and drainage under general anaesthesia with a secured airway evacuated pus from the cervical component, supported by intravenous ceftriaxone and metronidazole; the child recovered fully.

Conclusion: Delayed recognition of paediatric deep neck infection permits dangerous multicompartiment spread; integrated imaging-operative judgement and airway-focused multidisciplinary care are the decisive determinants of a favourable outcome.

All authors have reviewed and approved the final version of the manuscript.

1. Introduction

Deep neck space infections comprise all suppurative processes located within the potential spaces and fascial planes of the neck, bounded by the layers of the deep cervical fascia. These infections remain an important clinical problem in the paediatric population because the complex three-dimensional anatomy of the neck permits rapid spread between contiguous compartments, and because early signs are frequently subtle and easily underestimated.^{1,2} Among the deep neck spaces, the retropharyngeal, parapharyngeal, and peritonsillar compartments are the most commonly involved, and the retropharyngeal space is of particular concern in early childhood.²

The retropharyngeal space lies between the middle layer of the deep cervical fascia, which invests the pharynx and oesophagus anteriorly, and the alar division of the deep layer posteriorly. It extends from the skull base superiorly to the level of the first or second thoracic vertebra, where it communicates with the superior mediastinum. This space contains two paramedian chains of lymph nodes, the nodes of Rouvière, which drain the nasopharynx, paranasal sinuses, middle ear, and adjacent mucosal surfaces. These nodes are most prominent during the first years of life and subsequently involute, which explains why retropharyngeal abscess (RPA) occurs predominantly in young children, with the majority of cases arising before six years of age and a clustering in early

childhood.^{1,2} A modest male predominance has been reported in contemporary cohorts.³

Most paediatric RPAs are suppurative sequelae of a preceding upper respiratory tract infection, pharyngitis, tonsillitis, otitis media, or sinusitis, in which infected lymph reaches the retropharyngeal nodes and progresses through the stages of cellulitis, phlegmon, and organised abscess.^{2,4} Penetrating trauma of the posterior pharyngeal wall and retained or iatrogenic foreign bodies are additional recognised routes.⁵ The infection is typically polymicrobial, reflecting the resident upper-respiratory flora, with *Streptococcus* species, in particular *Streptococcus pyogenes*, and *Staphylococcus aureus* being the organisms most frequently implicated.^{3,6} Contemporary paediatric series, several of them reporting a marked rise in suppurative head and neck infections in the period after the coronavirus disease 2019 pandemic, indicate that the burden of these infections has been increasing, underscoring their continued clinical relevance.^{3,7}

The importance of prompt recognition lies in the severity of the potential complications. Anterior displacement of the posterior pharyngeal wall can obstruct the upper airway; lateral extension may involve the carotid sheath, threatening the internal carotid artery and internal jugular vein with pseudoaneurysm, thrombosis, or catastrophic haemorrhage; and inferior extension along the retropharyngeal and danger spaces can produce descending necrotising mediastinitis, one of the most lethal complications of head and neck infection.^{8,9} Because young children may present only with fever, neck stiffness, refusal to feed, drooling, or a muffled voice, a high index of suspicion and early cross-sectional imaging are essential to avert these outcomes.^{1,10}

Cervical (colli) abscess, arising from suppuration of an infected cervical lymph node or from spread of a deep

neck infection into the lateral neck soft tissues, may occur independently or in combination with a retropharyngeal collection. The simultaneous presence of a retropharyngeal abscess and a cervical abscess, particularly when accompanied by carotid-space extension and concurrent pulmonary infection in a very young child, is an uncommon and instructive clinical scenario. Reports that integrate the clinical, radiological, and operative correlation of such multicompartiment disease in the toddler age group remain scarce, and the discordance that may exist between imaging and intraoperative findings has been incompletely emphasised in the paediatric literature.^{2,11}

Novelty and aim. The novelty of this report lies in its detailed clinico-radiological-surgical correlation of a rare concurrent retropharyngeal and cervical abscess with carotid-space involvement and concomitant community-acquired pneumonia in a three-year-old child, in a setting where the coronavirus disease 2019 pandemic added a further layer of diagnostic and logistic complexity. The aim of this study is to describe the diagnostic reasoning, the multidisciplinary and airway-centred management, and the favourable outcome of this case, and to distil practical learning points regarding the recognition, imaging interpretation, and surgical drainage of multicompartiment deep neck infection in early childhood.

2. Case presentation

A three-year-old boy was brought by ambulance to the emergency department of Prof. Dr. I.G.N.G. Ngoerah General Hospital, Denpasar, on 6 August 2022, referred from a secondary hospital with a working diagnosis of suspected retropharyngeal abscess versus cervical lymphadenitis. Table 1 summarises the demographic, anamnestic, and baseline clinical characteristics of the patient.

Table 1. Demographic, anamnestic, and baseline clinical characteristics of the patient.

Parameter	Finding
Age / sex	3 years old / male
Ethnicity, religion	Balinese, Hindu
Referral	Referred by ambulance from a secondary hospital (suspected retropharyngeal abscess vs. cervical lymphadenitis)
Chief complaint	Progressively enlarging, reddish swelling of the left neck for ~20 days
Fever	Intermittent fever for 14 days before admission
Associated symptoms	Irritability, decreased appetite, muffled voice; vomiting of blood-stained pus 1 day before referral
Feeding	Tolerating only breast milk after the episode of purulent vomiting
Possible precipitant	Ingestion of a cassava chip ~14 days earlier with subsequent pain; no fish-bone/foreign-body history
Prior treatment	Oral antibiotics and antipyretics from a paediatrician, without improvement
Respiratory distress	Absent at presentation

According to the heteroanamnesis provided by the family, the child had developed a swelling on the left side of the neck approximately twenty days before admission. The swelling was reddish and had progressively enlarged over time. He had experienced

intermittent fever beginning fourteen days before presentation, during which he became increasingly irritable and his appetite declined. Notably, around the same time he had eaten a cassava chip and appeared to be in pain afterwards, followed by the onset of the

intermittent fever; there was, however, no clear history of fish-bone ingestion or other foreign body. He had first been treated by a paediatrician with oral antibiotics and antipyretics, but the complaints did not improve, prompting admission to the referring hospital. One day before transfer, the child vomited pus mixed with blood. From that point he was able to tolerate only breast milk, having previously accepted both solid and liquid food. The family also noted that his voice had become muffled. There was no history of shortness of breath, and no history of smoking or alcohol exposure in the household context relevant to the child. The full anamnestic profile is detailed in Table 1.

On arrival, the child appeared moderately ill and was *compos mentis* but poorly cooperative. Table 2 details

the vital signs, physical examination findings, and laboratory results obtained on admission together with their reference ranges. The blood pressure was 110/80 mmHg, axillary temperature 37.9 °C, pulse rate 94 beats per minute, respiratory rate 24 breaths per minute, and peripheral oxygen saturation 99% on room air. Examination of the ears and nose revealed no abnormality. On oropharyngeal examination the pharynx appeared hyperaemic. Inspection and palpation of the left cervical region (*regio colli sinistra*) demonstrated oedema and erythema, with the mass being warm and tender on palpation; frank fluctuation was not appreciated. The overlying skin of the upper chest also appeared erythematous. Figure 1 shows the clinical appearance of the neck and face at presentation, demonstrating the diffuse left-sided cervical swelling and erythema.

Table 2. Vital signs, physical examination, and laboratory findings on admission with reference ranges.

Parameter	Result	Reference range	Interpretation
Blood pressure	110/80 mmHg	90–110 / 55–75 mmHg*	High-normal for age
Temperature (axillary)	37.9 °C	36.5–37.5 °C	Low-grade fever
Pulse rate	94 beats/min	80–120 /min	Normal
Respiratory rate	24 breaths/min	20–30 /min	Normal
Oxygen saturation	99% (room air)	95–100%	Normal
General state	Moderately ill, <i>compos mentis</i>	—	Soft-tissue sepsis
Oropharynx	Hyperaemic pharynx	Non-hyperaemic	Pharyngeal inflammation
Left cervical region	Oedema, erythema, warm, tender; non-fluctuant	No mass	Deep neck collection
Chest wall skin	Erythematous over upper chest	Normal	Extension of inflammation
Leukocytes (referral)	29,970 /μL	4,000–12,000 / μ L	Marked leukocytosis
Leukocytes (admission)	16,430 /μL	4,000–12,000 / μ L	Leukocytosis
Haemoglobin	9.3 g/dL	10.5–13.5 g/dL	Mild anaemia

Notes: Values in bold red denote results outside the reference range. *Approximate age-specific normal blood pressure for a 3-year-old; all reference ranges are paediatric. mmHg, millimetres of mercury; μ L, microlitre; g/dL, grams per decilitre.



Figure 1. Clinical appearance on admission. Composite photographs demonstrate diffuse swelling and erythema of the left cervical region with warmth and tenderness on palpation. The periorbital region has been masked to protect patient privacy.

Laboratory evaluation revealed leukocytosis. As shown in Table 2, the leukocyte count documented at

the referring institution had reached 29,970/ μ L and was 16,430/ μ L on admission to the tertiary centre,

both markedly above the reference range and consistent with an active suppurative process, while the haemoglobin concentration was mildly reduced at 9.3 g/dL, in keeping with the anaemia of acute infection. Serial monitoring during the hospital course demonstrated a progressive decline of the leukocyte count toward normal values in parallel with clinical improvement.

An anteroposterior chest radiograph was obtained because of the respiratory findings and demonstrated an impression of suspected pneumonia, while the cardiac silhouette and the remainder of the lung fields showed no other abnormality. Figure 2 presents the admission chest radiograph. A paediatric consultation was requested, and the respiratory picture was interpreted as community-acquired pneumonia.



Figure 2. Anteroposterior chest radiograph on admission, showing an impression of pneumonia; the cardiac silhouette was within normal limits. Patient identifiers have been redacted.

To define the source and extent of the deep neck infection, contrast-enhanced computed tomography (CT) of the midface, neck, and thoracic inlet was performed on 6 August 2022. The study demonstrated heterogeneous soft-tissue thickening with an area of dense fluid attenuation within the left retropharyngeal space, showing heterogeneous and rim contrast enhancement, an appearance consistent with a retropharyngeal abscess. The collection extended into the carotid space and hypopharynx and

continued into the left cervical region, abutting and displacing the left carotid artery and displacing the trachea toward the right side. Multiple enlarged lymph nodes were present at left cervical levels IIA, IIB, III, IVa, Va, and VI. In addition, there was bilateral maxillary, ethmoid, and sphenoid sinusitis, and imaging features of pneumonia were again noted. Figure 3 shows representative sagittal and axial CT images of the retropharyngeal and cervical collection with its relationship to the airway and carotid space.

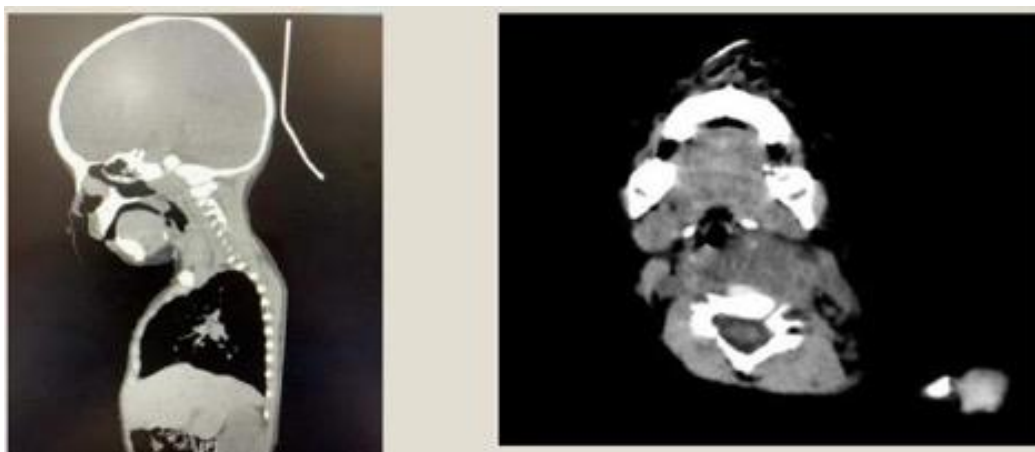


Figure 3. Contrast-enhanced computed tomography of the neck. Sagittal (left) and axial (right) images demonstrate a rim-enhancing retropharyngeal collection extending to the carotid space and left cervical region, abutting the left carotid artery and displacing the trachea to the right, with associated cervical lymphadenopathy.

On the basis of the integrated clinical and radiological findings, the patient was diagnosed with a suspected retropharyngeal abscess together with a left cervical (colli) abscess and community-acquired pneumonia. Because there was a concurrent suspicion of coronavirus disease 2019, the child was initially transferred to the paediatric isolation unit, and

definitive surgical drainage was planned to proceed once two consecutive reverse-transcription polymerase chain reaction (PCR) tests for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) had returned negative. Supportive and empirical medical therapy was commenced immediately, comprising nursing in the Trendelenburg position,

intravenous maintenance fluid (dextrose 5% in half-normal saline), intravenous ceftriaxone, intravenous metronidazole, intravenous dexamethasone, and

intravenous paracetamol. The complete pharmacological and supportive regimen, with doses and routes, is detailed in Table 3.

Table 3. Pharmacological and supportive treatment regimen administered during admission.

Agent / measure	Dose and route	Purpose
Trendelenburg positioning	Continuous nursing position	Airway protection; drainage of pharyngeal secretions
Dextrose 5% in ½ normal saline	14 drops/min, intravenous	Maintenance fluid and hydration
Ceftriaxone	800 mg once daily, intravenous	Broad-spectrum Gram-positive/negative cover
Metronidazole	170 mg three times daily, intravenous	Anaerobic cover
Dexamethasone	6 mg three times daily, intravenous	Reduction of inflammatory and airway oedema
Paracetamol	100 mg four times daily, intravenous	Antipyresis and analgesia
Incision and drainage	Under general anaesthesia (9 Aug 2022), airway secured with orotracheal tube	Source control; ~3 mL pus evacuated and cultured

On 7 August 2022 the child continued to have an enlarging, erythematous left neck swelling with cough and sputum, but remained able to take breast milk and formula; the oropharynx remained difficult to evaluate. The first SARS-CoV-2 PCR result was negative. On 8 August 2022 the clinical picture was unchanged and the second SARS-CoV-2 PCR was again negative, allowing surgical drainage to be scheduled under general anaesthesia. Prior to the procedure, an anaesthetic consultation classified the child as American Society of Anesthesiologists physical status III, a toddler with an adequate airway reserve but a probable difficult airway, with an active pneumonia and mild anaemia (haemoglobin 9.3 g/dL); postoperative care in the paediatric intensive care unit was arranged.

On 9 August 2022 incision and drainage were performed under general anaesthesia, with the airway secured by an orotracheal tube given the anticipated difficult airway and the airway-related risks of the deep neck collection. Aspiration was first performed in the retropharyngeal region, but no pus was obtained at that site. A horizontal incision was then made along the lower border of the most fluctuant area of the left cervical region; the abscess cavity was entered with a curved clamp, deepened by blunt dissection, and dilated to allow drainage, after which a drain was placed for continued evacuation. Approximately three millilitres of pus were evacuated and sent for culture and sensitivity testing, and the wound was partially closed on its medial aspect. The intraoperative steps are shown in Figure 4.

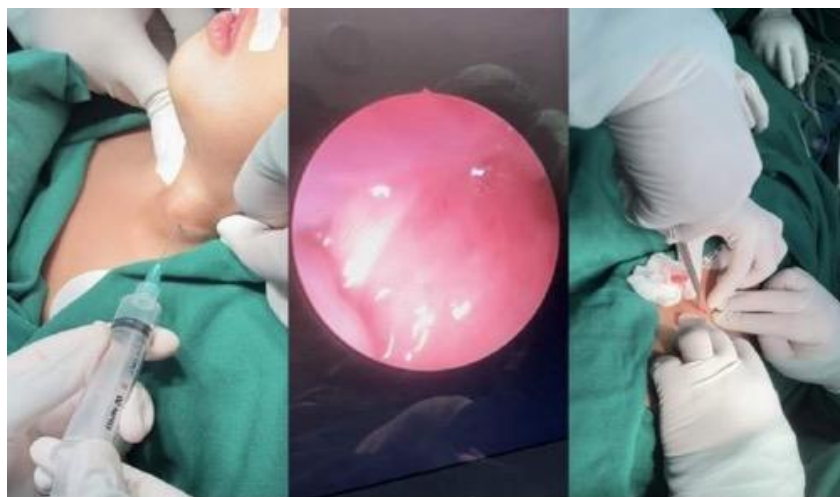


Figure 4. Intraoperative photographs of incision and drainage of the left cervical abscess under general anaesthesia with the airway secured. Needle aspiration (left), the drainage field (centre), and evacuation of purulent material (right) are shown.

During the postoperative course the surgical wound was managed with regular dressing changes and the drainage output was monitored. On 10 August 2022, the first postoperative day, no further pus was expressed and only serous oozing was noted on the gauze; the child was alert and comfortable. On 11 August 2022, the second postoperative day, the drainage had further diminished and the child was able to eat solid food. By 12 August 2022, the third

postoperative day, the general condition had clearly improved, and the child was eating and drinking well. He was discharged home in good condition with a scheduled outpatient review, and on 13 August 2022 the swab taken from the base of the wound returned no bacterial growth. The postoperative recovery of the neck and the healed incision at follow-up are demonstrated in Figure 5.



Figure 5. Postoperative recovery. The immediate postoperative appearance of the left neck with the healing incision (left) and the well-healed wound with resolution of swelling at outpatient follow-up (right).

At the outpatient review on 18 August 2022 the child was eating well and was no longer irritable; fever had resolved, and the erythema and swelling of the neck had disappeared. The incision from the drainage procedure was well healed. The overall clinical course,

from the prodromal community phase through admission, surgical treatment, and recovery, together with the trend in the serial leukocyte counts, is summarised in Figure 6.

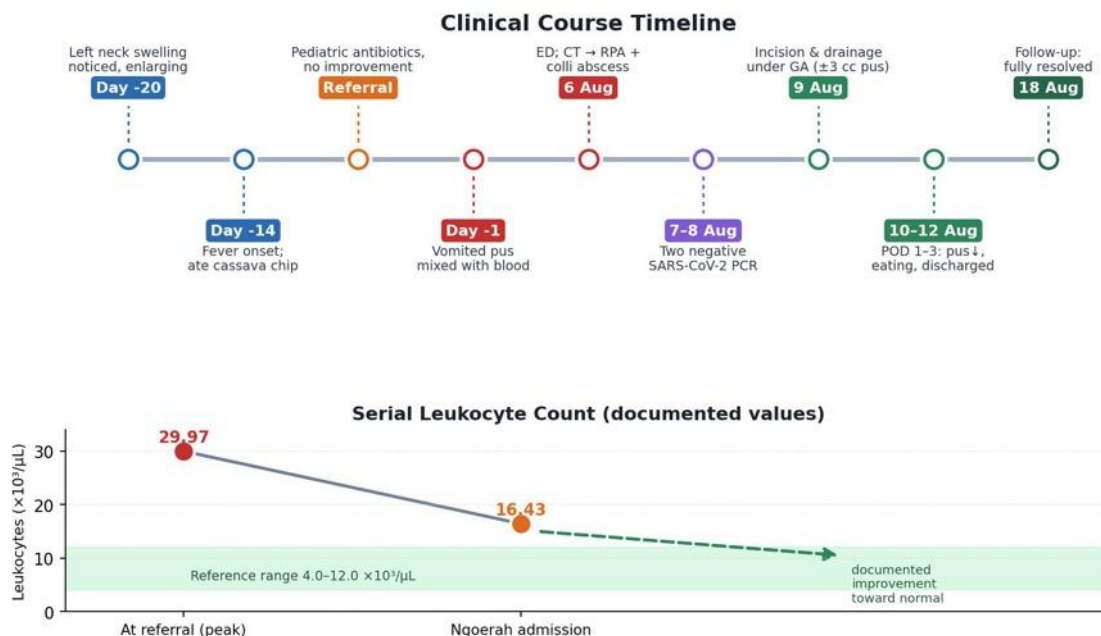


Figure 6. Clinical course timeline (upper panel) from the onset of neck swelling through admission, surgical drainage, and full resolution at follow-up, and the trend in the documented serial leukocyte counts (lower panel), which declined toward the reference range in parallel with clinical recovery.

3. Discussion

This case illustrates the natural history, diagnostic complexity, and management of a concurrent retropharyngeal and cervical abscess in a young child, and highlights several instructive points that are relevant to otorhinolaryngologists, paediatricians, and emergency physicians. The patient displayed the classic epidemiological profile of retropharyngeal abscess, being a boy within the early-childhood age band in which the condition characteristically clusters, a distribution attributed to the prominence of the retropharyngeal lymph nodes of Rouvière during early childhood and their subsequent involution.^{1,2} The presentation, however, was neither immediate

nor typical in its tempo, and it is precisely this protracted, initially indolent course that offers the most important lessons.^{11,12}

Pathogenesis and the antecedent source

In the majority of paediatric retropharyngeal abscesses, the infection begins as suppurative lymphadenitis of the retropharyngeal nodes following an upper respiratory tract infection, pharyngitis, otitis, or sinusitis, and then evolves through cellulitis and phlegmon before organising into a discrete abscess.^{2,4} In the present case, the child had a preceding period of intermittent fever and pharyngeal inflammation, and the CT study additionally revealed pan-sinusitis, providing a plausible mucosal source from which

infected lymph could drain into the retropharyngeal and cervical nodal chains. The temporal association with the ingestion of a cassava chip is noteworthy: although no radio-opaque foreign body or overt mucosal laceration was demonstrated, minor trauma to the posterior pharyngeal wall from a hard food fragment can breach the mucosal barrier and inoculate the retropharyngeal space, and such dietary or foreign-body events are recognised precipitants of deep neck infection in children.⁵ The infection in these circumstances is characteristically polymicrobial, involving upper-respiratory aerobes and anaerobes, which provides the rationale for empirical broad-spectrum, anaerobe-inclusive antimicrobial therapy.^{3,6}

The evolution of the illness in this child, from a neglected, slowly enlarging neck swelling with intermittent fever into a multicompartment suppurative process, mirrors reports in which delayed presentation or inadequate initial treatment permits deep neck infection to progress and spread.^{3,12} The failure of the initial oral antibiotic course to control the disease, and the subsequent spontaneous decompression manifested as vomiting of blood-stained pus, both signalled a mature, organised collection that would ultimately require source control rather than antibiotics alone.¹¹

Clinical recognition and the value of a high index of suspicion

Young children with retropharyngeal abscess frequently cannot articulate their symptoms, and the disease may masquerade as a simple febrile illness, torticollis, or an uncomplicated neck mass.^{10,13} In this patient the combination of fever, irritability, feeding refusal, a muffled voice, and a tender, warm cervical swelling was highly suggestive of a deep neck infection, and the report of blood-stained purulent vomitus was a particularly ominous clue to a draining retropharyngeal collection. Reassuringly, there was no stridor, drooling, or respiratory distress at presentation, but the absence of overt airway symptoms must never be interpreted as evidence of a benign process, because deterioration can be abrupt.⁹ Torticollis and neck stiffness, which are frequent and sometimes dominant features of retropharyngeal abscess, can lead the unwary clinician toward a musculoskeletal diagnosis and delay appropriate imaging.¹³ A deliberate, low threshold for considering deep neck infection in a febrile child with neck signs is therefore essential.¹

The differential diagnosis in a child with a subacute cervical mass and systemic symptoms is broad and includes reactive and suppurative lymphadenitis, atypical mycobacterial infection, and, importantly, malignancy such as lymphoma. Persisting cervical lymphadenopathy, particularly when associated with constitutional symptoms, anaemia, and abnormal laboratory findings, warrants careful evaluation to exclude a neoplastic cause, and structured approaches to paediatric cervical lymphadenopathy emphasise

the role of history, examination, imaging, and, when indicated, biopsy.¹⁴ In the present case the rapid response to drainage and antibiotics, the purulent aspirate, and the sterile wound culture on follow-up supported an infective rather than a neoplastic process, but the initial breadth of the differential reinforces why cross-sectional imaging and, where doubt persists, tissue sampling are valuable.¹⁴

The role and interpretation of imaging

Contrast-enhanced CT is the reference-standard imaging modality for deep neck infection, because it distinguishes cellulitis and phlegmon from a drainable abscess, delineates the compartments involved, and demonstrates critical relationships to the airway and the great vessels.^{15,16} In this patient CT was decisive: it confirmed a rim-enhancing retropharyngeal collection, defined its extension into the carotid space, hypopharynx, and left cervical region, and, most importantly, revealed that the collection abutted the left carotid artery and displaced the trachea. Rim or ring enhancement on CT, together with a larger cross-sectional dimension of the collection, is a recognised radiological signature of an organised abscess and has been associated with a higher likelihood of obtaining pus at surgery, whereas its absence favours phlegmon that may respond to antibiotics alone.^{15,16} The lateral spread to the carotid space in this case is particularly significant, because carotid-sheath involvement carries the risk of septic thrombophlebitis of the internal jugular vein, the Lemierre syndrome, and of arterial complications such as pseudoaneurysm, and it mandates vigilant, expeditious management.^{8,9}

A practical caveat emerged from the correlation of imaging and operative findings. Although CT demonstrated a retropharyngeal collection, aspiration of the retropharyngeal region at operation yielded no pus, and the purulent material was obtained instead from the cervical component. This discordance underscores that cross-sectional imaging maps the anatomical extent of disease but cannot always predict where a mature, evacuable collection will be encountered intraoperatively, and that the surgical approach must be guided by the point of maximal fluctuance and by real-time findings.¹⁶ In selected paediatric cases, intra-operative or point-of-care ultrasound has been advocated precisely to localise collections that are difficult to reach and to reduce operative morbidity, and the increasing use of point-of-care ultrasound in the emergency setting offers a radiation-sparing adjunct for the initial identification of deep neck collections.^{17,18,19} The multilevel cervical lymphadenopathy and pan-sinusitis seen on CT further corroborated a lymphatic and mucosal pathway of spread and helped to frame the infection as a contiguous, multicompartment process rather than an isolated retropharyngeal event.²

Medical management and antimicrobial considerations

All children with an established retropharyngeal infection require admission, intravenous antibiotics

that cover upper-respiratory aerobes and anaerobes, and involvement of an otorhinolaryngologist.¹¹ In this patient empirical therapy comprised intravenous ceftriaxone combined with metronidazole, a regimen that provides broad Gram-positive, Gram-negative, and anaerobic coverage appropriate to the polymicrobial nature of deep neck infection.⁶ Contemporary microbiological studies of paediatric deep neck infection are directly relevant to antimicrobial choice. *Staphylococcus aureus* and streptococci are consistently among the most frequently isolated organisms, and high rates of resistance to penicillin and ampicillin have been documented, whereas agents such as clindamycin, together with anaerobic cover, retain good activity; these findings argue against reliance on aminopenicillins alone and support the use of a beta-lactamase-stable regimen with anaerobic coverage until culture results are available.^{3,6}

The administration of a short course of corticosteroid in this child, as intravenous dexamethasone, is consistent with evidence that adjunctive corticosteroids, alongside intravenous antibiotics, can reduce the duration of symptoms, the rate of surgical drainage, and the length of hospital stay in paediatric parapharyngeal and retropharyngeal abscess managed conservatively, and may help to attenuate airway-threatening oedema.²⁰ Nursing in the Trendelenburg position, as employed here, is a simple measure intended to protect the airway and to facilitate drainage of pharyngeal secretions, and similar positioning has been described in the management of retropharyngeal abscess presenting acutely.¹³ Elevated inflammatory markers, particularly leukocytosis and C-reactive protein, have been associated with more severe disease and with the need for intensive care in paediatric deep neck infection, which supports the serial monitoring of the leukocyte count undertaken in this child as a marker of therapeutic response.²¹

A recurring theme in the paediatric literature is that a substantial proportion of children with radiological evidence of a deep neck collection can be managed successfully with intravenous antibiotics alone, and that neither clinical features nor simple laboratory parameters reliably predict which patients will fail medical therapy.^{1,16,22} The decision to proceed to surgery in the present case rested not on any single parameter but on the totality of the picture: a large, organised, rim-enhancing multicompartiment collection with carotid-space extension, a mature abscess that had already partially decompressed spontaneously, and a failure of prior antibiotic treatment. In this context, source control was clearly indicated rather than a further trial of antibiotics alone.^{11,23}

Surgical drainage, airway management, and timing

Surgical drainage is indicated for a deep neck abscess when there is airway compromise, an established or

enlarging collection, a complication, or a failure to improve on medical therapy, and larger collections and cross-sectional dimensions are more likely to require operative intervention.^{11,15} In this child, incision and drainage were performed once two negative SARS-CoV-2 tests had been obtained, a delay imposed by the pandemic infection-control pathway rather than by the surgical indication; the reorganisation of care and the increase in severe paediatric neck infections during this era have been widely documented.^{3,7} During this interval the child was maintained on intravenous antibiotics and corticosteroid and monitored closely, an approach that was reasonable given the absence of acute airway compromise, though it also illustrates the tension that the pandemic introduced between infection-control requirements and the timeliness of source control.⁴

Airway management is the foremost priority in the operative management of deep neck infection in children. The anaesthetic assessment in this case explicitly identified a probable difficult airway, reflecting the distortion of the pharyngeal and laryngeal anatomy by the collection and the tracheal displacement demonstrated on CT, and the airway was secured with an orotracheal tube in a controlled setting before drainage, with intensive care arranged postoperatively.^{9,10} This cautious, anticipatory strategy accords with reports emphasising that, when retropharyngeal abscess threatens the airway, definitive airway control by an experienced anaesthetist and otolaryngologist working together should precede or accompany drainage.^{9,10}

The operative strategy itself is instructive. Retropharyngeal collections that point medially are commonly drained transorally, whereas collections that involve the lateral neck or carotid space are approached externally through a cervical incision that permits wide exposure and dependent drainage.² Here, aspiration of the retropharyngeal region yielded no pus, and the abscess was successfully drained through an external cervical incision placed at the most fluctuant point, with blunt exploration of the cavity and placement of a drain. The volume of pus evacuated was modest, at approximately three millilitres, which is consistent with a collection that had already partially decompressed spontaneously, and the material was appropriately sent for culture and sensitivity. Attention to adequate exploration of the abscess cavity and to drain management is important, because inadequate breakdown of loculations or premature drain removal has been associated with treatment failure and the need for reoperation in paediatric deep neck abscess.²³ The subsequent sterile wound culture is unsurprising in a child who had received prior and concurrent antibiotics, a phenomenon well described in deep neck infection series in which pre-treatment lowers the yield of positive cultures.⁶

Complications, and why prompt management mattered

The complications of retropharyngeal and cervical abscess are the principal reason that these infections must be recognised and treated without delay. Anterior extension may obstruct the airway; lateral extension into the carotid space, as in this patient, risks internal jugular thrombophlebitis and the Lemierre syndrome as well as arterial injury; and inferior extension along the retropharyngeal and danger spaces can produce descending necrotising mediastinitis, a complication with historically high mortality that demands early recognition, aggressive surgical drainage, and multidisciplinary intensive care.^{8,9,24} Retropharyngeal and anterior visceral space involvement and markedly elevated inflammatory markers have been identified as risk factors for progression to mediastinitis, and multidisciplinary protocols combining otorhinolaryngological and thoracic surgical care have been shown to reduce mortality.^{8,24} In the present case, the demonstration of carotid-space extension and tracheal displacement placed the child at genuine risk of these outcomes, and it was the combination of timely imaging, airway-focused anaesthetic care, appropriate antimicrobial therapy, and definitive surgical drainage that allowed such complications to be averted and a complete recovery to be achieved.

The coexistence of community-acquired pneumonia in this child added both diagnostic noise and clinical risk. Pneumonia may arise in this setting from aspiration of infected pharyngeal secretions or purulent material, or as part of a wider respiratory infection, and its presence compounds the respiratory vulnerability of a child who already has an airway-threatening neck collection.⁵ The concurrent suspicion of coronavirus disease 2019 further complicated triage and

mandated isolation and testing before operative intervention, a scenario that was widespread during the pandemic and that could reasonably delay source control; awareness of this interaction remains relevant for the management of deep neck infection under evolving infection-control conditions.^{4,7}

Comparison with the literature

When placed alongside previously reported cases and series, the present case is consistent with established patterns while adding an uncommon combination of features. Table 4 compares the salient characteristics of this patient with selected recent reports of paediatric retropharyngeal and deep neck abscess. As shown in Table 4, young age, an antecedent respiratory or mucosal source, a rim-enhancing collection on CT, airway-focused management, and a favourable outcome after drainage are recurring themes across these reports, whereas the simultaneous presence of a retropharyngeal and a cervical abscess with carotid-space extension and concurrent pneumonia in a toddler is a comparatively distinctive constellation.^{5,9,10,25,26} Recent reports of life-threatening retropharyngeal abscess in infants emphasise, as this case does, that delayed diagnosis permits dangerous progression and that securing the airway is paramount.^{9,10} Contemporary series reinforce that *Staphylococcus aureus* and streptococci predominate, that a preceding upper respiratory infection is the commonest antecedent, and that outcomes are generally good when management is prompt and appropriate.^{1,3,6} The atypical presentations documented in the literature, including abscesses presenting as torticollis and those progressing to the Lemierre syndrome, are reminders that the clinician must remain alert to unusual aetiologies and presentations even when the common pattern seems evident.^{9,13}

Table 4. Comparison of the present case with selected recent reported paediatric retropharyngeal and deep neck abscess cases.

Study	Age / sex	Site / extension	Airway status	Management	Outcome
Present case	3 y / M	Retropharyngeal + cervical (colli), carotid space, tracheal displacement	Difficult airway; no distress; OTT for surgery	IV ceftriaxone + metronidazole + steroid; external incision and drainage	Full recovery
Rehman et al. (2023)	10 mo / infant	Retropharyngeal with airway obstruction	Threatened; grade-3 intubation	Endoscopic trans-oral incision and drainage; IV antibiotics	Recovery
Walker et al. (2025)	6 mo / infant	Retropharyngeal → empyema, Lemierre, carotid pseudoaneurysm	Threatened; challenging anaesthesia	Multiple drainage procedures; antithrombotic and respiratory support	Recovery
Xu et al. (2025)	18 mo / F	Retropharyngeal + pneumonia; tracheal compression	Threatened; intubation, ventilation	Surgical drainage + targeted antibiotics	Recovery
Li et al. (2025)	9 y / child	Retropharyngeal + parapharyngeal	Preserved	Intravenous antibiotics only, no surgery	Recovery
Amirkhanian et al. (2024)	Includes a child	Retropharyngeal; multi-space	Variable	Contrast CT; IV antibiotics + surgical drainage	Recovery

Notes: y, years; mo, months; M, male; F, female; IV, intravenous; OTT, orotracheal tube; CT, computed tomography.

This report is subject to the intrinsic limitations of a single-patient case description: it cannot establish causation or generalisable frequency, the

microbiological yield was limited by prior antibiotic exposure, and some laboratory parameters were incompletely available across the transfer of care.

Nevertheless, the detailed clinical, radiological, and operative correlation presented here offers practical value, and the learning points are transferable. The principal messages are that deep neck infection in a young child may follow an initially indolent, easily underestimated course before spreading across multiple compartments; that contrast-enhanced CT is indispensable for defining extent and vascular relationships but does not obviate the need for intraoperative judgement; that airway management by a coordinated anaesthetic and surgical team is the cornerstone of safe drainage; and that timely source control, combined with anaerobe-inclusive antibiotics and supportive care, reliably delivers an excellent outcome even in complex multicompartment disease.^{11,16,23}

Learning points and implications for practice

Several practical lessons can be distilled from this case for clinicians who encounter febrile neck swelling in young children. First, the tempo of paediatric deep neck infection is variable, and a subacute, indolent course does not exclude a serious, organising collection; a swelling that enlarges over days to weeks despite oral antibiotics should prompt cross-sectional imaging rather than continued expectant treatment.^{11,16} Second, certain historical and examination features function as red flags that warrant urgent evaluation, including a muffled or altered voice, drooling or feeding refusal, neck stiffness or torticollis, and, as in this child, the vomiting of purulent or blood-stained material, which may signal spontaneous decompression of a mature abscess.^{10,13} Third, the interpretation of imaging must be actively integrated with the operative plan: the presence of rim enhancement raises the probability of obtaining pus, but the exact location of an evacuable collection is ultimately determined at surgery, and the surgeon must be prepared to adapt the approach when the anticipated retropharyngeal pus is not encountered.^{15,16}

Fourth, the airway is the dominant consideration throughout, from triage to the operating theatre and into the postoperative period. Tracheal displacement and pharyngeal distortion demonstrated on imaging should be communicated explicitly to the anaesthetic team, and definitive airway control should be achieved in a controlled environment with senior anaesthetic and otolaryngological presence and a clear plan for a difficult airway.^{9,10} Fifth, empirical antimicrobial therapy should reflect contemporary local microbiology and resistance patterns, favouring beta-lactamase-stable agents with dedicated anaerobic cover, because reliance on aminopenicillins alone risks undertreatment of the *Staphylococcus aureus* and anaerobic organisms that predominate in paediatric deep neck infection; therapy should then be refined according to culture and sensitivity whenever a specimen can be obtained.^{3,6} Sixth, the value of specimen collection should not be abandoned even when the child has already received antibiotics, since

a negative culture, as here, still contributes to excluding resistant or atypical organisms and to guiding de-escalation.⁶

Finally, the case demonstrates the importance of a genuinely multidisciplinary pathway. The coordinated involvement of otorhinolaryngology, paediatrics, anaesthesiology, radiology, and intensive care allowed the competing demands of infection control, respiratory support, and timely source control to be balanced safely, and it is this integrated approach, rather than any single intervention, that best explains the favourable outcome.^{7,9,24} Where available, adjunctive point-of-care or intra-operative ultrasound may further refine the localisation of collections and reduce operative morbidity in future cases, and its wider adoption in the paediatric emergency and operative setting is a reasonable aspiration.^{17,18,19}

4. Conclusion

A three-year-old boy with a concurrent retropharyngeal and cervical (colli) abscess complicated by carotid-space extension, multilevel cervical lymphadenopathy, pan-sinusitis, and community-acquired pneumonia was successfully managed and recovered completely. The case demonstrates that paediatric deep neck infection can begin as a neglected, slowly enlarging neck swelling with only intermittent fever before progressing to a life-threatening, multicompartment suppurative process, and that a high index of suspicion is essential to avoid delay. Contrast-enhanced computed tomography was pivotal for defining the extent of disease and its relationship to the airway and the great vessels, yet the absence of pus on retropharyngeal aspiration at operation underscores that imaging and intraoperative findings must be interpreted together. Airway-centred, multidisciplinary care, comprising anticipatory airway control, broad-spectrum anaerobe-inclusive antibiotics with adjunctive corticosteroid, and timely surgical drainage through an external cervical approach, produced full resolution without complication. This experience reinforces that early recognition, appropriate imaging, and prompt source control with meticulous airway management are the determinants of a favourable outcome in complex paediatric deep neck space infection.

Declarations

Ethics approval and consent to participate

This case report was conducted in accordance with the principles of the Declaration of Helsinki. Reporting of anonymised case details and images followed institutional requirements for case reports.

Consent for publication

Written informed consent for publication of this case report and the accompanying clinical images was obtained from the parent/legal guardian of the child.

Availability of data and materials

All data supporting the findings of this case report are included within the article.

Competing interests

The authors declare that they have no competing interests.

Funding

No specific funding was received.

Authors' contributions

K.T.M.N.P. and I.G.A.M.D. managed the patient, conceived the report, and drafted the manuscript; M.A.D. and P.D.A.P. contributed to clinical management, the literature review, and critical revision. All authors have reviewed and approved the final version of the manuscript.

Acknowledgements

The authors thank the patient and his family, and the multidisciplinary team involved in the care of this patient.

5. References

- Havazelet S, Coreanu T, Klein T, et al. Pediatric deep neck infections: does age matter? *Pediatr Infect Dis J*. 2025;45(4):295-299. Doi: 10.1097/INF.0000000000005044
- Hao L, Wei Y, Lin J, et al. Clinical characteristics and etiological profile of retropharyngeal space abnormalities in children: a nine-year retrospective analysis. *Front Pediatr*. 2026;13:1727123. Doi: 10.3389/fped.2025.1727123
- Taplin I, Williams PCM, Lee JWY, et al. Suppurative cervical infections in Australian children: a retrospective cohort study pre- and post-COVID-19 pandemic. *Pediatr Infect Dis J*. 2025;44(11):1030-1037. <https://doi.org/10.1097/INF.0000000000004877>
- Sheikh A, Capello C, AlMubarak Z, et al. Changes in operative otolaryngology infections related to the COVID-19 pandemic: a retrospective cohort study. *Int J Pediatr Otorhinolaryngol*. 2023;171:111650. Doi: 10.1016/j.ijporl.2023.111650
- Xu C, Liu X, Guo Y, et al. Life-threatening pediatric retropharyngeal abscess: a case report on delayed complication of endoscopic fishbone removal in an infant. *Medicine (Baltimore)*. 2025;104(38):e43664. Doi: 10.1097/MD.00000000000043664
- Kharel B, Shahi K, Gurung U. Antibiotic resistance pattern in pediatric deep neck space infection. *Int Arch Otorhinolaryngol*. 2022;26(4):e585-e591. Doi: 10.1055/s-0042-1744042
- La Cognata D, Finocchiario MC, Trobia GL, et al. Septic complications of head and neck infections as emerging conditions in the post-COVID-19 era: an epidemiological study in a pediatric care center in Sicily. *Ital J Pediatr*. 2025;51(1):14. Doi: 10.1186/s13052-025-02148-8
- Hu CY, Lien KH, Chen SL, et al. Risk factors of descending necrotizing mediastinitis in deep neck abscesses. *Medicina (Kaunas)*. 2022;58(12):1758. Doi: 10.3390/medicina58121758
- Walker A, Lugo N, Elaref H, et al. Rapidly progressing retropharyngeal abscess in a six-month-old: anesthetic and diagnostic challenges leading to Lemierre's syndrome. *Cureus*. 2025;17(8):e90187. Doi: 10.7759/cureus.90187
- Rehman AU, Khan S, Abbas A, et al. Life-threatening complication of retropharyngeal abscess in an infant: a case report. *J Med Case Rep*. 2023;17(1):367. Doi: 10.1186/s13256-023-04101-x
- Fitzsimons M, Boyle S, Colreavy M, et al. Retrospective review of 33 cases of paediatric retropharyngeal and parapharyngeal infections and a proposed algorithm for managing future cases. *J Laryngol Otol*. 2025;1-7. Doi: 10.1017/S0022215125102703
- Nicotera DJ, Islam AA, Liu Y, et al. Disparities in the presentation and management of pediatric retropharyngeal abscess. *Laryngoscope*. 2024;134(4):1907-1912. Doi: 10.1002/lary.31048
- Kubat GO, Altindal AS. Retropharyngeal abscess presenting as torticollis. *J Coll Physicians Surg Pak*. 2022;32(12):SS157-SS159. Doi: 10.29271/jcpsp.2022.Supp0.SS157
- Sen HS, Ocak S, Yilmazbas P. Children with cervical lymphadenopathy: reactive or not? *Turk J Pediatr*. 2021;63(3):363-371. Doi: 10.24953/turkjped.2021.03.003
- Liu Y, Nicotera DJ, Islam AA, et al. Prognostic factors for retropharyngeal abscess in children receiving surgery or antibiotic therapy. *Laryngoscope*. 2024;134(4):1955-1960. Doi: 10.1002/lary.31064
- Virbalas J, Friedman NR. Impact of neck CT on the management of suspected pediatric deep neck space infection. *Int J Pediatr Otorhinolaryngol*. 2021;147:110782. Doi: 10.1016/j.ijporl.2021.110782
- Malia L, Sivitz A, Chicaiza H. A novel approach: point-of-care ultrasound for the diagnosis of retropharyngeal abscess. *Am J Emerg Med*. 2021;46:271-275. Doi: 10.1016/j.ajem.2020.07.060
- Scheier E, Shapira-Levy E, Oren S. Point of care ultrasound (POCUS) diagnosis of deep neck space abscess: a case series. *J Emerg Med*. 2024;71:60-66. Doi: 10.1016/j.jemermed.2024.10.004
- Torretta S, Ibba T, Guastella C, et al. Management of upper retropharyngeal abscesses in children: two case reports of a troublesome situation. *Clin Case Rep*. 2021;9(10):e04598. Doi: 10.1002/ccr3.4598
- Villanueva-Fernandez E, Casanueva-Muruais R, Vivanco-Allende A, et al. Role of steroids in conservative treatment of parapharyngeal and retropharyngeal abscess in children. *Eur Arch Otorhinolaryngol*. 2022;279(11):5331-5338. Doi: 10.1007/s00405-022-07423-6
- Kurt F, Yigit H, Kaynak MO, et al. Predictors of pediatric intensive care unit admission in pediatric deep neck infections: a retrospective observational study. *Medicine (Baltimore)*. 2025;104(48):e46302. Doi: 10.1097/MD.00000000000046302
- Sunakawa T, Mizuta M, Mizuno S, et al. Clinical characteristics and efficacy of antimicrobial treatment in pediatric parapharyngeal abscess without surgical intervention. *J Infect Chemother*. 2025;31(6):102719. Doi: 10.1016/j.jiac.2025.102719

23. Engebretsen S, Afify O, Ahluwalia J, et al. Failure factors in pediatric deep neck space abscess surgical management. *Int J Pediatr Otorhinolaryngol.* 2022;164:111413. Doi: 10.1016/j.ijporl.2022.111413
24. Ho CY, Chin SC, Chen SL. Management of descending necrotizing mediastinitis, a severe complication of deep neck infection, based on multidisciplinary approaches and departmental co-ordination. *Ear Nose Throat J.* 2022;103(9):572-579. Doi: 10.1177/01455613211068575
25. Li T, Yang C, Hao X, et al. Antibiotic-only treatment of pediatric retropharyngeal and parapharyngeal abscess: a case report. *Cureus.* 2025;17(9):e93147. Doi: 10.7759/cureus.93147
26. Amirkhanian E, Kostlivy T, Hauer L, et al. Deep neck infections - case reports. *Rozhl Chir.* 2024;103(12):508-514. doi: 10.48095/ccrvch2024508