

# Effective geriatric management strategies for fatal non-Hodgkin lymphoma: Insights from a case report

Deysi Cristina Páez-Calvopiña<sup>a</sup> , Alberto Bustillos<sup>b</sup> , Elena Vicenta Hernández-Navarro<sup>b</sup> , Estefania Carolina Salazar-Garcés<sup>c</sup> , Luis Fabián Salazar-Garcés<sup>b\*</sup> 

<sup>a</sup>Faculty of Health Sciences, Higher Polytechnic School of Chimborazo, Riobamba, Ecuador; <sup>b</sup>Faculty of Health Sciences, Technical University of Ambato, Ambato, Ecuador; <sup>c</sup>Higher Polytechnic School of the Army, Ambato, Ecuador

## ABSTRACT

This case report delves into the intricate medical history of an 85-year-old male who experienced a myriad of health challenges throughout his years. With a medical history full of conditions, such as stroke, sinus bradycardia, chronic obstructive pulmonary disease, severe pulmonary hypertension, and chronic gastritis, the patient's health profile is further complicated by prostatic hypertrophy, persistent dorsalgia and lumbalgia, the presence of a thyroid nodule, and a recent onset of hypothyroidism. Among the diverse medical conditions of this patient, our narrative is primarily centered on his latest diagnosis: non-Hodgkin's lymphoma. Non-Hodgkin's lymphoma is not just a mere addition to his already complex medical history; it is a malignant neoplasm that shapes worldwide patterns of cancer mortality. The first indicators that led to this discovery were the patient's complaints of persistent pain in the left lateral neck region associated with dysphagia. This was not an isolated symptom; the patient also reported a month-long history of asthenia, myalgias, weakness around the pelvic girdle, fatigue, and hyporexia, depicting a concerning clinical picture. Advanced diagnostic tools, namely ultrasound and computed tomography, shed light on submaxillary and cervical adenopathies.

To corroborate such findings and get a definitive diagnosis of malignancy, a fine-needle aspiration was advised. Through this case, we aim not only to describe a clinical scenario but to highlight the challenges involved in the diagnosing and treatment of non-Hodgkin's lymphoma, especially in elderly patients. The overlap of multiple comorbidities adds further complexity to the scene, demanding meticulous care and expertise. This report serves as an educational tool for oncology experts, as well as testimony to the complexities of patient care in the oncology diagnostic and treatment setting.

**KEYWORDS** Non-Hodgkin's lymphoma, diagnosis, comorbidity, case report

## INTRODUCTION

Neoplastic diseases are a leading cause of mortality worldwide, affecting both developing and developed countries, with a higher prevalence in individuals from developing nations [1,2]. According to reports from the World Health Organization (WHO), approximately 8 million people die annually from this group of diseases, with 70% of these deaths occurring in Asia, Africa, Central America, and South America [3]. The WHO estimates that 14 million new cancer cases are diagnosed each

year, and they predict that these numbers will rise to over 22 million annual diagnoses within the next two decades [4,5].

Although cancer can affect individuals of any age, sex, or race, there is a higher incidence in people over the age of 60 [6,7]. Non-Hodgkin's lymphoma is a cancer that affects both males and females, although it is more frequently diagnosed in men [6,8,9]. It is a heterogeneous group of malignant neoplasms originating from lymphoid tissue, primarily affecting lymph nodes and other immune structures such as the spleen [6,10,11].

Non-Hodgkin's lymphoma can be further divided into various subtypes based on cellular origin. B-cell non-Hodgkin lymphoma is the most common form, accounting for about 25% of diagnosed cases [12–14]. This subtype has an incidence rate of 7 cases per 100 000 people and is more common in the Americas, representing approximately 40% of all non-Hodgkin lymphoma diagnoses [15–17]. The immune and digestive systems are frequently implicated in the development of these neoplasms [16,18,19].

\* Corresponding author lf.salazar@uta.edu.ec

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**Postal address** Av. Colombia and Chile s/n Technical University of Ambato, Ambato, Ecuador

## MAIN MESSAGES

- Non-Hodgkin's lymphoma is regarded as one of the most aggressive forms of cancer.
- In this case, however, an early diagnosis, coupled with appropriate treatment, resulted in effective disease management.

Despite the diversity in histology and morphology of non-Hodgkin lymphoma, its clinical manifestations are common across all forms. Symptoms include night sweats, fever, cough, weight loss, generalized itching, and cervical, axillary, and inguinal lymphadenopathy [20–24]. Additional symptoms can include headaches, cognitive disturbances, gastrointestinal complaints, and even seizures [25–27].

The diagnosis of non-Hodgkin lymphoma relies on epidemiological factors, clinical manifestations, laboratory tests, and histopathological studies [28]. Upon suspicion of this disease, a series of examinations must be conducted, including blood tests, imaging studies, and lymph node biopsies [29,30]. Once the diagnosis is confirmed, treatment options are determined based on the specific subtype, disease stage, patient health status, and the presence of clinical symptoms [31,32].

## CASE PRESENTATION

Male patient of 85 years old, mestizo, and married. Residing in a rural area of Ecuador, where he was born. He has an incomplete primary education, worked in a railway company, and retired.

## MEDICAL AND FAMILY HISTORY

The patient experienced a stroke seven years ago, resulting in left hemiparesis as a sequela. Since that time, he has had moderate sinus bradycardia, a type of cardiac arrhythmia. Additionally, the patient has been treated for his chronic obstructive pulmonary disease for seven years, with two inhalations of ipratropium bromide every eight hours. He was diagnosed with severe pulmonary hypertension by echocardiogram six years ago, while chronic gastritis was identified through an upper digestive endoscopy the same year.

Six years ago, the patient was diagnosed with grade II prostatic hypertrophy, weighing 44 grams. He has been experiencing chronic back pain for the past ten years. A thyroid nodule measuring 13 mm was discovered seven years ago, and the patient was diagnosed with hypothyroidism ten days ago; ever since, he has been receiving a daily oral dose of 25 micrograms of sodium levothyroxine.

The patient underwent a craniotomy seven years ago due to chronic subdural hematoma and cerebral empyema. Additionally, he underwent a right hip replacement 25 years ago. The patient also has a known allergy to penicillin.

In the family medical history, his son was diagnosed with type 2 diabetes mellitus.

The reason for his current consultation was pain in the left lateral neck region and dysphagia.

## CURRENT ILLNESS

The patient's daughter reports that one month ago (22-10-2018), the patient experienced moderate-intensity pain (a score of six on the visual pain scale) in the left lateral neck region that did not improve with changes in position or administration of traditional analgesics: one gram paracetamol every eight hours. The pain was accompanied by asthenia, myalgia, pelvic girdle weakness, fatigue, hyporexia, and dysphagia with solid foods for ten days, as well as halitosis and epigastralgia. The patient went to the emergency department, where he was prescribed amoxicillin/clavulanate every eight hours for seven days and nonsteroidal anti-inflammatory drugs. With these symptoms, the patient visited a general medicine outpatient clinic and was referred to an Otorhinolaryngologist on 30-11-2018. Neck ultrasound revealed left submaxillary and cervical nodules of six mm and two cm and right submaxillary and right cervical adenopathies of nine mm and one cm, respectively. A simple and contrast-enhanced neck computed tomography and fine-needle aspiration were indicated.

Upon reviewing the patient's current state of health, the following observations were made: there was no evidence of pathology in the skin or adnexa, sense organs, anoperineal region, respiratory, cardiovascular, osteomuscular, nervous, or genitourinary systems.

During the physical examination, the patient's vital signs showed a temperature of 37.9 degrees Celsius, a heart rate of 66 beats per minute, a respiratory rate of 22 breaths per minute, blood pressure of 100/60 millimeters of mercury (mmHg) with a mean arterial pressure of 77 mmHg, and an oxygen saturation of 82% on room air.

The patient's anthropometric measurements showed a weight of 39 kilograms, a height of 148 centimeters, and a body-mass index of 17.8 Kg/m<sup>2</sup>, indicating underweight status. The patient appeared alert, conscious, and oriented. He is an elderly ectomorphic individual with a left hemiparetic gait, dyslalia, and a notably pale face.

Upon head examination, a scar was present in the right frontal and parietal region. The patient's eyes had bilateral grade II pterygium, and his ears were symmetrical and proportionate, without auricular alterations. The external auditory canal appeared patent. The nose showed normal nasal mucosa on rhinoscopy, with septal deviation. The patient had complete upper and lower edentulism and a hyperemic oropharynx on the left lateral pillar. The patient was uncooperative with the examination due to pain.

The neck was of normal size, mobile, and painful to digital pressure. A palpable nodule was present in the left thyroid lobe, along with three cervical and submaxillary lymphadenopathies

adhered to deep planes that were painful at the left submaxillary level. No jugular engorgement was observed.

The chest examination revealed right dorsal kyphoscoliosis and symmetrically decreased thoracic expansion. The heart displayed arrhythmic sounds with increased intensity of the second sound in the pulmonary area. The lungs had decreased fremitus, dullness, and crackles at the bases. The abdomen was hollow, soft, and depressible, with superficial pain upon palpation in the epigastrium. No visceromegaly was observed, and bowel sounds were present. The lumbar region exhibited scoliosis, negative fist percussion, and a normal inguinal-genital region. No apparent pathology was found in the external genitalia. The ano-perineal region had a trophic anal sphincter.

The patient's limbs showed bilateral quadriceps hypotrophy, bilateral patellar crepitus, and a positive Auhansen's sign in the right knee. Muscle weakness in the pelvic girdle was 4/5.

The neurological examination revealed a hemiparetic gait, slightly decreased muscle strength in the pelvic girdle, and decreased muscle tone with trophic lower limbs, particularly both femoral quadriceps. Hyporeflexia of cutaneous, mucosal, and osteotendinous reflexes was noted. Preserved superficial (thermal, tactile, and painful) and deep (barognosis, pallesthesia, batiesthesia, and stereognosis) sensitivity was observed. The patient tested negative for Kernig's, Brudzinski's, and nuchal rigidity signs.

**Diagnostic impression:** Non-Hodgkin's lymphoma.

After completing the anamnesis and physical examination and determining the syndromic diagnoses, a series of diagnostic tests were indicated, the most relevant of which were the following:

**Echocardiogram (18-06-2013, HOSPITAL IESS RIOBAMBA):** Severe pulmonary hypertension, normal biventricular systolic function (ejection fraction of 75%), grade 1 left ventricular diastolic dysfunction, eccentric left ventricular hypertrophy, and the presence of a dilated pulmonary artery.

**Neck ultrasound (20-11-2018, HOSPITAL ANDINO):** Left submaxillary and cervical region with nodules of 6 mm and 2 cm, respectively; right submaxillary and cervical region with 9 mm and 1 cm lymphadenopathies.

**Neck computed tomography (26-12-2018, HOSPITAL IESS RIOBAMBA):** Pharyngeal space without alterations, submaxillary and parotid glands had adequate density without focal lesions, pharynx, larynx, and trachea appeared normal. Multiple large adenopathies displaced the trachea and esophagus without causing complete airway obstruction (Figures 1 and 2).

**Cytology of the lymph node (18-12-2019, SOLCA):** The patient underwent histopathologic studies, including fine-needle aspiration, which revealed a suspicious left cervical lymph node suggestive of a lymphoma diagnosis.

**Complete blood count (08-01-2019, IESS Riobamba):** The blood test showed significant leukocytosis of  $13.6 \times 10^9/L$ , while other results were negative.

**Liver function tests (14-01-2019, IESS Riobamba):** The liver function tests showed a slight increase in alkaline phosphatase

and lactate dehydrogenase. Coagulation times, blood gas analysis, ionogram, electrolytes, serologies, and urine tests did not provide positive results relevant to the clinical interpretation of the case. Positive C-reactive protein (197.99 mg/L) and negative procalcitonin were found. Tumoral markers (Carcinoma antigen-125 (CA), CA 19-9, anti-thyroperoxidase antibodies, and CA 15-3) also did not provide significant results.

**Blood chemistry (02-02-2019, Hospital IESS Riobamba):** The blood chemistry analysis showed a slight increase in blood glucose and urea levels.

**Lipid profile (02-02-2019, Hospital IESS Riobamba):** The lipid profile was within normal parameters.

Simple and contrast-enhanced chest and abdomen computed tomography findings included atelectasis and chronic bronchitis (03-02-2019, Hospital IESS Riobamba) (Figure 3).

**Chest X-ray and anteroposterior abdomen (03-02-2019, Hospital IESS Riobamba):** Pleuropulmonary process with bronchoalveolar pattern diffusely affecting both lung fields. No other pleuropulmonary alterations.

**Upper digestive endoscopy (01-04-2019, Hospital IESS Riobamba):** Small hiatal hernia, grade I distal erosive esophagitis, and moderate high erosive gastritis.

**Lymph node biopsy (05-04-2019, SOLCA):** Surgical lymph node excision was performed for confirmatory biopsy. Immunohistochemical analysis confirmed the diagnosis of non-Hodgkin's lymphoma with the following findings:

- BCL 2: positive +++
- CD 3: negative in study cells, positive in accompanying cellularity
- CD 5: positive ++
- CD 20: positive +++
- CD 79 A: positive ++
- CYCLIN D1: positive ++
- KI 67: positive 100%
- P 53: positive ++

These findings concluded the presence of a mantle cell non-Hodgkin's lymphoma with B immunophenotype and a high proliferation prognosis due to the presence of KI 67, P 53, and CYCLIN D1.

**Imaging studies:** Positive findings included a diffuse pleuropulmonary process affecting both lung fields.

Based on the anamnesis, physical examination, and results of the auxiliary tests (blood, histopathological, and imaging), the following definitive nosological diagnoses were reached:

**Definitive diagnoses:**

- Mantle cell non-Hodgkin's lymphoma with B immunophenotype
- Community-acquired pneumonia
- Chronic obstructive pulmonary disease: chronic bronchitis

**In-hospital course:**

**Figure 1.** Neck computed tomography evidencing an image compatible with a malignant neoplastic process affecting the left lateral cervical lymph nodes.



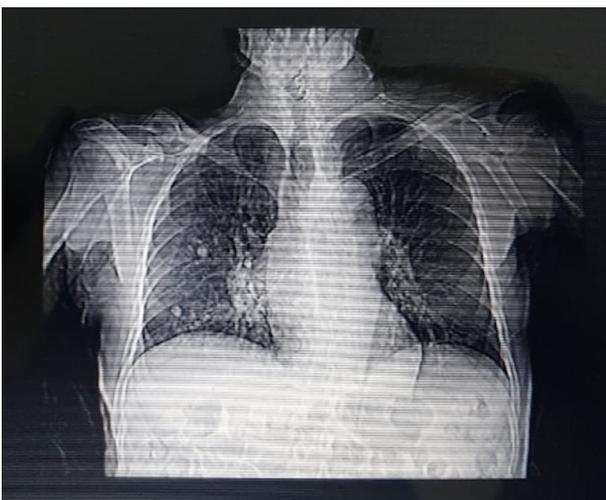
Source: Provided by the authors.

**Figure 2.** Neck computed tomography revealing findings compatible with cervical lymphadenopathy and potential malignant transformation with surrounding inflammatory infiltrates.



Source: Provided by the authors.

**Figure 3.** Chest computed tomography displaying images indicative of atelectasis and chronic bronchitis.



Source: Provided by the authors.

The patient was hospitalized four times over the course of four months, with the following notable clinical and laboratory events:

- Rotation of antibiotic therapy on the third day of treatment to intravenous ceftriaxone 1 gram every 12 hours and levofloxacin 500 milligrams daily.
- Normalization of leukocyte count and C-reactive protein on the fourth day of hospitalization, with discharge after seven days due to respiratory improvement.
- A second video endoscopy confirmed the presence of a laryngeal tumor with high suspicion of laryngotracheal fistula despite the absence of clinical features suggestive of this disease.
- The general surgery and oncology evaluations, considering the poor prognosis, comorbidities, and risks of surgery, led to the decision not to implement surgical treatment or chemotherapy. Instead, symptomatic treatment and high doses of corticosteroids were

prescribed to reduce inflammation, with palliative home care.

- The patient passed away at home after four months.

## DISCUSSION

Non-Hodgkin lymphoma is a complex neoplastic disease characterized by its rapid progression and poor prognosis, often making it one of the most challenging malignancies in medical practice [33]. The case under discussion involved a male patient over 65 years old, consistent with the typical demographics of non-Hodgkin lymphoma, complicated by his personal history of hypothyroidism and a previous hemorrhagic stroke, potentially linked to hypertension. This demographic and clinical background is crucial as it underscores the multifaceted nature of non-Hodgkin lymphoma, with age, gender, and medical history playing a role in disease onset and progression [34].

The emergence of cervical and submandibular lymphadenopathy within a short period was a critical clinical clue leading to suspicion of non-Hodgkin lymphoma [35]. However, the overlap of these symptoms with the patient's preexisting comorbidities, such as a hiatal hernia and respiratory infection, underscores the challenges for early diagnosis of this disease [36]. The initial laboratory finding of leukocytosis further complicated his clinical context, suggesting an inflammatory process that could be mistaken for a less severe condition [37]. Such diagnostic challenges are common in non-Hodgkin's lymphoma and highlight the limitations of relying solely on clinical manifestations and routine laboratory tests for early detection [24,38].

In this case, imaging studies revealed comorbidities, particularly digestive and respiratory disorders, rather than directly indicating non-Hodgkin lymphoma [39,40]. This is a common scenario in elderly patients, where multiple health issues can mask the underlying malignancy. However, ultrasound and neck computed tomography results supporting the diagnosis of non-Hodgkin lymphoma emphasized the need for comprehensive diagnostic approaches [41,42]. This necessity is further supported by histopathological confirmation, which established the diagnosis and provided valuable information regarding tumor staging and extent [43]. Histopathology remains the definitive method for diagnosing this disease, reflecting the importance of tissue analysis in understanding the disease's nature [44,45].

The patient's prognosis was significantly influenced by factors such as advanced age and the presence of comorbidities. Detecting prognostic and proliferation markers like Ki-67 and p53 in the histopathological studies gloomed the prognosis, indicating a highly aggressive disease course. As noted in the literature, these markers are associated with rapid disease progression and poor outcomes [27,43]. Such findings often limit therapeutic options and require a more cautious approach to treatment planning.

In this case, the therapeutic strategy focused on using high doses of corticosteroids to control inflammation and reduce the risks of compression, a decision influenced by the patient's

overall health status and the high-risk nature of his lymphoma. While not curative, this approach aimed to manage symptoms and improve the patient's quality of life [46,47].

Non-Hodgkin's lymphoma complexity and the challenges presented in this case underscore the importance of a multidimensional approach to diagnosis and treatment. Early recognition of the disease, based on clinical assessment, laboratory testing, imaging, and histopathological evaluation, is crucial [48]. However, the case also illustrates that even with comprehensive diagnostic tools, this disease can be a formidable adversary, particularly in patients with multiple comorbidities and advanced age. The need for ongoing research into more effective, targeted therapies for non-Hodgkin lymphoma is evident, as current treatment options may not suffice in more complex cases with poor prognosis [49,50].

In summary, non-Hodgkin's lymphoma management requires a thorough understanding of its biological and pathological aspects and a keen awareness of the patient-specific factors that can influence disease progression and treatment outcomes. The case discussed here provides valuable insights into the intricacies of diagnosing and treating non-Hodgkin's lymphoma, highlighting areas where further research and development could improve patient care.

## CONCLUSIONS

In conclusion, this clinical case report delineates the intricate diagnostic journey of an 85-year-old male patient who exhibited a multifaceted medical history and multiple comorbidities, presenting with pain in the left lateral neck region and dysphagia. A rigorous assessment, encompassing a detailed physical examination, advanced imaging studies, such as computed tomography and magnetic resonance imaging, as well as histopathological analysis, culminated in the accurate diagnosis of mantle cell non-Hodgkin's lymphoma with B immunophenotype, community-acquired pneumonia, and chronic obstructive pulmonary disease characterized by chronic bronchitis.

Owing to the patient's advanced age, poor prognosis, and the presence of multiple comorbidities, the multidisciplinary healthcare team weighed the risks and benefits of aggressive interventions and reached a consensus to forego invasive surgical procedures or intensive chemotherapy regimens. Instead, the focus shifted towards providing the patient with symptomatic relief and palliative care to ensure optimal quality of life during the remaining time.

This case underscores the importance of thorough evaluation and interdisciplinary collaboration in complex diagnostic scenarios, particularly for geriatric patients with a myriad of coexisting conditions. Furthermore, it serves as a testament to the significance of adopting a patient-centered approach, factoring in the patient's overall health, quality of life, and individual preferences when determining the most appropriate course of action in clinical management. This case report contributes valuable insights to the body of knowledge

surrounding the diagnostic and decision-making process for health experts, and it emphasizes the need for continuous professional development in the ever-evolving field of medicine.

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# Estrategias geriátricas efectivas para el tratamiento del linfoma no Hodgkin mortal: conclusiones de un estudio de caso

## RESUMEN

Este reporte de caso se centra en el intrincado historial médico de un varón de 85 años que experimenta una miríada de problemas de salud a lo largo de sus años. Con un historial médico lleno de afecciones, como accidente cerebrovascular, bradicardia sinusal, enfermedad pulmonar obstructiva crónica, hipertensión pulmonar grave y gastritis crónica, el perfil de salud del paciente se complica aún más por la presencia de hipertrofia prostática, dorsalgia y lumbalgia persistentes, la presencia de un nódulo tiroideo y el reciente diagnóstico de hipotiroidismo.

Entre las diversas afecciones de este paciente, nuestra narración se centra principalmente en su último diagnóstico: linfoma no Hodgkin. El linfoma no hodgkiniano no es un mero añadido a su ya complejo historial médico; es una neoplasia maligna que configura las tendencias de mortalidad por cáncer a nivel mundial. Los primeros indicadores que llevaron a este descubrimiento fueron las quejas del paciente por dolor persistente en la región lateral izquierda del cuello, asociado a disfagia. No se trataba de un síntoma aislado, ya que el paciente también refería desde hacía un mes astenia, mialgias, debilidad alrededor de la cintura pélvica, fatiga e hiporexia, lo que describía un cuadro clínico preocupante. Las herramientas diagnósticas avanzadas, a saber, la ecografía y la tomografía computarizada, arrojaron luz sobre las adenopatías submaxilares y cervicales, revelaron sobre las adenopatías submaxilares y cervicales.

Para corroborar tales hallazgos y obtener un diagnóstico definitivo de malignidad, se aconsejó una aspiración con aguja fina. A través de este caso, pretendemos no sólo describir un escenario clínico, sino resaltar los retos que implica el diagnóstico y tratamiento del linfoma no Hodgkin, especialmente en pacientes de edad avanzada. La superposición de múltiples comorbilidades añade mayor complejidad al escenario, exigiendo una atención meticulosa y experiencia. Este informe sirve como herramienta educativa para los expertos en oncología, así como testimonio de las complejidades de la atención al paciente en el entorno del diagnóstico y el tratamiento oncológico.



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