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Case Report

Mandibular Langerhans Cell Histiocytosis in Pediatric and Geriatric Patients: Report of Two Cases with Contrasting Clinical Features

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Abstract

Langerhans Cell Histiocytosis (LCH) is a rare clonal proliferative disorder of dendritic cells that most commonly affects children but may also present in adults and elderly patients. When the mandible is involved, its clinical and radiographic appearance often mimics a variety of benign or malignant jaw lesions, posing significant diagnostic challenges for dental and medical practitioners. In this report, we describe two illustrative cases of mandibular LCH occurring at opposite ends of the age spectrum. The first case involved a 3-year-old girl who presented with a painless swelling in the anterior mandible. Radiographic examination revealed a poorly defined radiolucent lesion, and histopathological analysis with molecular testing confirmed LCH harboring the BRAF V600E mutation. The patient received targeted therapy with Vemurafenib, resulting in substantial clinical improvement and sustained remission during follow-up. The second case concerned a 65-year-old male who presented with persistent mandibular pain, lower-lip paresthesia, and an intraoral ulcer. Imaging demonstrated multiple bilateral punched-out radiolucencies in the mandible. Histopathological and immunohistochemical studies confirmed the diagnosis of LCH. The patient underwent surgical segmental resection of the affected mandible with subsequent reconstruction using a titanium plate, leading to satisfactory healing and no evidence of recurrence on follow-up. These contrasting cases emphasize the importance of considering LCH in the differential diagnosis of mandibular lesions across all age groups. Prompt imaging, biopsy, molecular testing, and multidisciplinary management are crucial for accurate diagnosis and effective treatment strategies that improve patient outcomes.

Keywords

Langerhans Cell Histiocytosis, Mandible, Pediatric, Elderly, Jaw Lesions, Case Report

1. Introduction

Langerhans Cell Histiocytosis (LCH) is the most common entity within the spectrum of histiocytic disorders. It is characterized by the clonal proliferation of antigen-presenting dendritic cells and most frequently affects the bones, skin, lymph nodes, and lungs [1, 2].

In some cases, the oral cavity may represent the initial site

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of LCH manifestation, and occasionally, it may be the only area involved—making early dental evaluation critical for diagnosis [3]. Oral involvement in LCH has been reported in up to 77% of cases, making the dental practitioner often the first to recognize the disease. For clinical clarity, oral manifestations can be categorized into three major groups: osseous, mucosal, and periodontal lesions [4].

Although LCH is more prevalent in pediatric populations, adult cases are likely underdiagnosed due to their rarity and variable presentation [5-8]. In this report, we present two cases of mandibular LCH—one in a young child and the other in an elderly adult—highlighting the age-dependent variability in clinical features and management approaches.

2. Case Presentation

2.1. Case 1: Pediatric Patient

A three-year-old girl was referred to the Department of Oral and Maxillofacial Surgery due to a firm, non-tender swelling in the anterior mandible. Clinical evaluation revealed no signs of ulceration or systemic symptoms. A panoramic radiograph demonstrated a poorly defined radiolucent lesion extending across the anterior mandible (Figure 1).

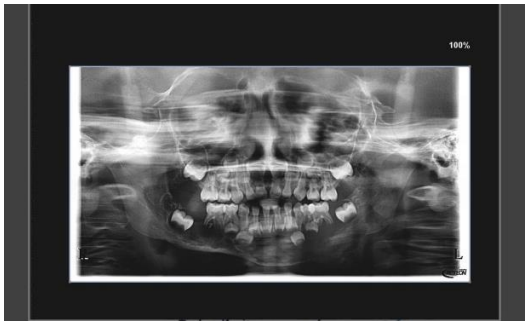

Figure 1. *Panoramic radiograph of a 3-year-old girl showing a poorly defined radiolucent lesion in the anterior region of the mandible, involving the developing primary and permanent teeth.*

The initial differential diagnosis included central giant cell granuloma (CGCG), Langerhans cell histiocytosis (LCH), and leukemia. An incisional biopsy was performed, and histopathological examination confirmed the diagnosis of LCH. Molecular analysis using PCR–pyrosequencing revealed a BRAF V600E mutation, further supporting the diagnosis.

The patient received targeted therapy with Vemurafenib (Zelboraf) and showed a favorable response. She is currently under close clinical and radiological follow-up with no evidence of progression.

2.2. Case 2: Elderly Patient

A 65-year-old male presented with persistent mandibular pain, lower lip paresthesia, and an intraoral ulceration in the right posterior mandible. Panoramic imaging revealed multiple ill-defined punched-out radiolucent lesions involving both sides of the mandible (Figure 2).

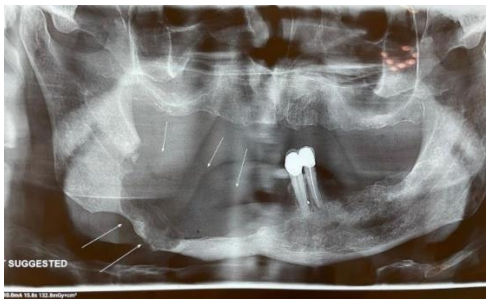

Figure 2. *Panoramic radiograph of a 65-year-old male showing bilateral, poorly defined punched-out radiolucent lesions in the mandibular body.*

An incisional biopsy was obtained. Histologic examination showed sheets of large mononuclear cells with grooved, cleaved "coffee bean" nuclei (Figure 3) and prominent eosinophilic infiltrates (Figure 4), which are characteristic of LCH.

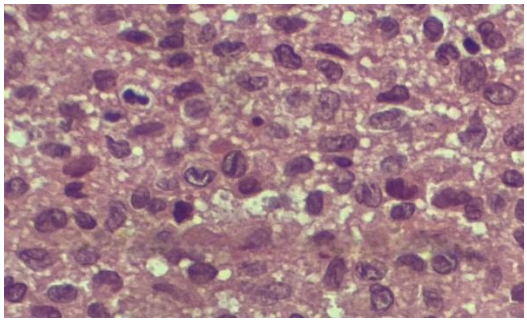

Figure 3. *High-power photomicrograph demonstrating Langerhans cells with characteristic coffee bean–shaped cleaved nuclei (H&E, ×400).*

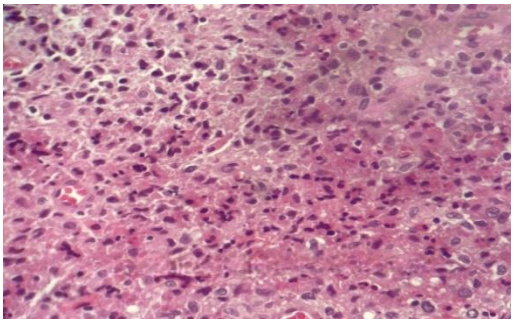

Figure 4. *Histopathological section showing dense eosinophilic infiltrates, a typical feature of Langerhans cell histiocytosis (H&E, ×400).*

Immunohistochemical studies confirmed the Langerhans cell lineage, showing strong positivity for CD1a (Figure 5), S100 (Figure 6), and CD68 (Figure 7), along with nuclear expression of Cyclin D1 (Figure 8), consistent with clonal proliferation.

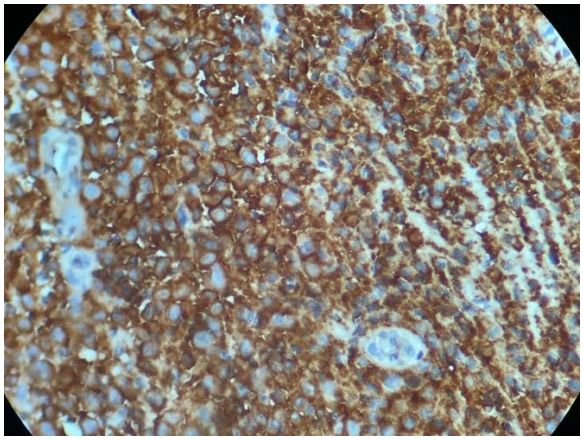

Figure 5. *Immunohistochemical staining showing strong membranous CD1a positivity in neoplastic Langerhans cells (×400).*

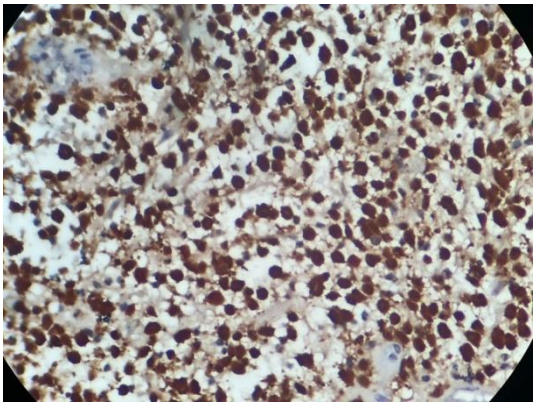

Figure 6. *Immunohistochemistry demonstrating diffuse nuclear and cytoplasmic S100 positivity, supporting LCH diagnosis (×400).*

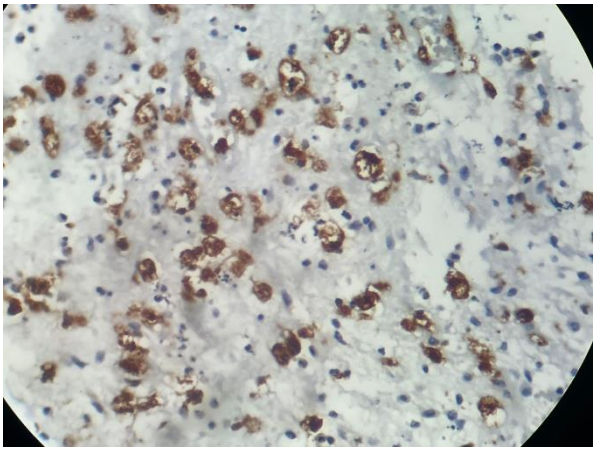

Figure 7. *Immunohistochemical staining showing strong cytoplasmic CD68 positivity in lesional histiocytes (×400).*

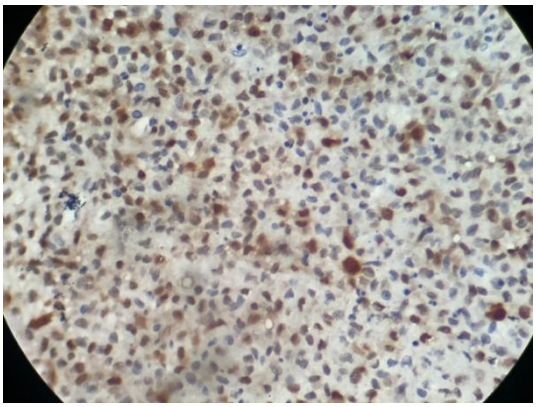

Figure 8. *Immunohistochemistry demonstrating diffuse nuclear Cyclin D1 expression in Langerhans cells (×400), supporting clonal proliferation.*

Surgical resection of the affected mandibular segment was carried out (Figure 9), and the defect was subsequently reconstructed using a titanium fixation plate, as seen in the postoperative panoramic radiograph (Figure 10). The gross specimen demonstrated extensive bony destruction consistent with Langerhans cell histiocytosis (Figure 9). The postoperative course was uneventful, and healing progressed satisfactorily. At the most recent follow-up, the patient remained asymptomatic with no clinical or radiographic signs of recurrence.

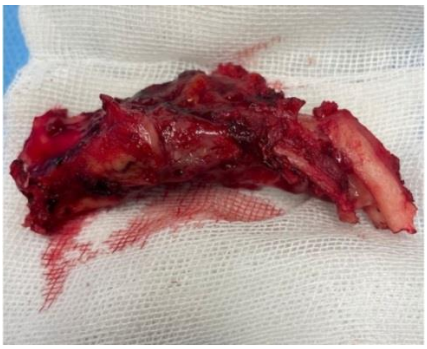

Figure 9. *Gross specimen of the resected mandibular segment showing extensive bony destruction and fragmentation, consistent with advanced Langerhans cell histiocytosis.*

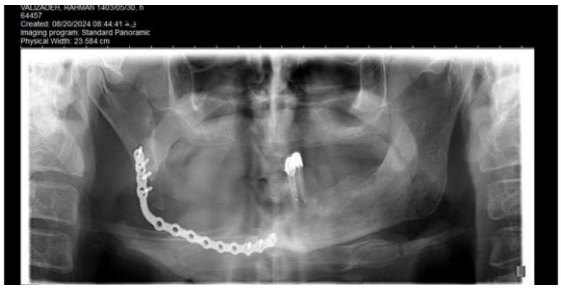

Figure 10. *Postoperative panoramic radiograph revealing successful reconstruction of the mandibular defect using a titanium fixation plate following segmental resection.*

3. Discussion

This report delineateshow mandibular Langerhans cell histiocytosis (LCH) may present at opposite extremes of the age spectrum, each exhibiting distinct clinical characteristics. In our experience, the pediatric patient presented with a focal anterior mandibular lesion, identified incidentally during routine evaluation for swelling—ultimately managed successfully with targeted therapy. In contrast, the geriatric patient manifested extensive, unilateral bone involvement accompanied by pain, paresthesia, and mucosal ulceration, necessitating surgical resection and reconstruction. These two cases underscore the heterogeneous and unpredictable clinical behavior of LCH highlighting how patient age, lesion distribution, and symptomatology critically influence both diagnostic strategy and therapeutic planning.

Langerhans Cell Histiocytosis is estimated to occur in 2.6-8.9 per million children under 15 years annually, with the median age at diagnosis of approximately 3 years [5-8]. The incidence in adults remains poorly defined; however, data on disseminated disease suggest a prevalence of roughly 0.07 per million per year [9, 10].

Recent evidence indicates that the BRAF V600E mutation occurs in 50–60% of LCH cases and correlates with more aggressive or recurrent disease [11, 12]. In our pediatric case, detection of this mutation informed the use of Vemurafenib, resulting in a favorable outcome [13]. Conversely, in the elderly patient, although immunohistochemistry confirmed the Langerhans cell origin of the lesion, molecular profiling was not performed, and management relied primarily on surgical resection. These contrasting approaches exemplify the emerging role of precision medicine in LCH management, particularly in younger patients where systemic involvement is more likely to be screened and addressed early.

In both cases, oral manifestations were the initial or sole presentation, underscoring the crucial role of dental professionals in early detection [14]. Panoramic radiography served as a vital diagnostic tool, revealing the characteristic radiolucent lesions that prompted further investigation [15]. Nevertheless, the nonspecific radiographic appearance can mimic odontogenic cysts, tumors, or infections, often leading to diagnostic delays. This underscores the importance of maintaining a broad differential diagnosis when evaluating atypical radiographic features, particularly in pediatric and geriatric patients. Early biopsy and histopathological confirmation remain essential for establishing a definitive diagnosis and initiating timely treatment [16].

These cases illustrate the broad clinical spectrum of mandibular LCH and highlight the necessity of a multidisciplinary diagnostic and management approach. Dentists, oral radiologists, pathologists, and medical specialists must remain vigilant when confronted with unusual jaw lesions, especially in patients at the extremes of age. Timely recognition and referral can significantly influence outcomes, whether through early targeted therapy in children or prompt surgical intervention in adults. As understanding of LCH evolve, integration of molecular diagnostics into routine workup—where feasible—may further optimize patient care.

4. Conclusions

Mandibular Langerhans cell histiocytosis may present with varied clinical features across different age groups, ranging from isolated pediatric lesions to more extensive, symptomatic disease in elderly patients. These cases underscore the critical role of oral health professionals in early detection and diagnosis. Timely imaging, biopsy, and multidisciplinary collaboration are essential for guiding appropriate treatment, whether systemic or surgical. Recognition of atypical presentations can improve outcomes and reduce diagnostic delays, especially in non-pediatric populations. These findings highlight the importance of considering LCH even in atypical age groups and support early diagnostic intervention to optimize outcomes.

Abbreviations

LCH	Langerhans Cell Histiocytosis
CGCG	Central Giant Cell Granuloma
PCR	Polymerase Chain Reaction
H&E	Hematoxylin and Eosin
IHC	Immunohistochemistry
CD	Cluster of Differentiation
BRAF	v-Raf Murine Sarcoma Viral Oncogene Homolog B1

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Author Contributions

Samira Mostafazadeh: Conceptualization, Supervision, Validation, Pathological Investigation.

Masoud Fallahi Motlagh: Investigation, Resources, Surgical Treatment.

Nesa Rasooli: Data curation, Visualization, Writing – original draft, Writing – review & editing.

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Data Availability Statement

The data supporting the outcome of this research work has been reported in this manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

References

[1] Favara BE, Feller AC, Pauli M, Jaffe ES, Weiss LM, Arico M, et al. Contemporary classification of histiocytic disorders. Medical and Pediatric Oncology: The Official Journal of SIOP—International Society of Pediatric Oncology (Societé Internationale d'Oncologie Pédiatrique. 1997; 29(3): 157-66. https://doi.org/10.1002/(SICI)1096-911X(199709)29:3%3C157::AID-MPO1%3E3.0.CO;2-C

[2] van de Ven R, van den Hout MF, Lindenberg JJ, Sluijter BJ, van Leeuwen PA, Lougheed SM, et al. Characterization of four conventional dendritic cell subsets in human skin-draining lymph nodes in relation to T-cell activation. Blood, The Journal of the American Society of Hematology. 2011; 118(9): 2502-10. https://doi.org/10.1182/blood-2011-03-344838

[3] Shirley J, Thornton JB. Oral manifestations of Langerhans' cell histiocytosis: review and report of case. ASDC Journal of Dentistry for Children. 2000; 67(4): 293-6.

[4] Hernández-Juyol M, Boj-Quesada JR. Oral manifestations of Langerhans cell histiocytosis. Case study of a two-year-old boy. Medicina Oral: Organo Oficial de la Sociedad Espanola de Medicina Oral y de la Academia Iberoamericana de Patologia y Medicina Bucal. 2003; 8(1): 19-25.

[5] Alston RD, Tatevossian R, McNally RJ, Kelsey A, Birch JM, Eden TO. Incidence and survival of childhood Langerhans cell histiocytosis in Northwest England from 1954 to 1998. Pediatric blood & cancer. 2007; 48(5): 555-60. https://doi.org/10.1002/pbc.20884

[6] Guyot‐Goubin A, Donadieu J, Barkaoui M, Bellec S, Thomas C, Clavel J. Descriptive epidemiology of childhood Langerhans cell histiocytosis in France, 2000–2004. Pediatric blood & cancer. 2008; 51(1): 71-5. https://doi.org/10.1002/pbc.21498

[7] Salotti JA, Nanduri V, Pearce MS, Parker L, Lynn R, Windebank KP. Incidence and clinical features of Langerhans cell histiocytosis in the UK and Ireland. Archives of disease in childhood. 2009; 94(5): 376-80. https://doi.org/10.1136/adc.2008.144527

[8] Stålemark H, Laurencikas E, Karis J, Gavhed D, Fadeel B, Henter JI. Incidence of Langerhans cell histiocytosis in children: a population‐based study. Pediatric blood & cancer. 2008; 51(1): 76-81. https://doi.org/10.1002/pbc.21504

[9] Baumgartner I, von Hochstetter A, Baumert B, Luetolf U, Follath F. Langerhans'‐cell histiocytosis in adults. Medical and Pediatric Oncology: The Official Journal of SIOP—International Society of Pediatric Oncology (Societé Internationale d'Oncologie Pédiatrique. 1997; 28(1): 9-14. https://doi.org/10.1002/(SICI)1096-911X(199701)28:1%3C9::AID-MPO3%3E3.0.CO;2-P

[10] Goyal G, Shah MV, Hook CC, Wolanskyj AP, Call TG, Rech KL, et al. Adult disseminated Langerhans cell histiocytosis: incidence, racial disparities and long‐term outcomes. British journal of haematology. 2018; 182(4). https://doi.org/10.1111/bjh.14818

[11] Badalian-Very G, Vergilio J-A, Degar BA, MacConaill LE, Brandner B, Calicchio ML, et al. Recurrent BRAF mutations in Langerhans cell histiocytosis. Blood, The Journal of the American Society of Hematology. 2010; 116(11): 1919-23. https://doi.org/10.1182/blood-2010-04-279083

[12] Berres M-L, Lim KPH, Peters T, Price J, Takizawa H, Salmon H, et al. BRAF-V600E expression in precursor versus differentiated dendritic cells defines clinically distinct LCH risk groups. Journal of Experimental Medicine. 2014; 211(4): 669-83. https://doi.org/10.1084/jem.20130977

[13] Hyman DM, Puzanov I, Subbiah V, Faris JE, Chau I, Blay J-Y, et al. Vemurafenib in multiple nonmelanoma cancers with BRAF V600 mutations. New England Journal of Medicine. 2015; 373(8): 726-36. https://doi.org/10.1056/nejmoa1502309

[14] Luz J, Zweifel D, Hüllner M, Bühler M, Rücker M, Stadlinger B. Oral manifestation of Langerhans cell histiocytosis: a case report. BMC Oral Health. 2018; 18: 1-6. https://doi.org/10.1186/s12903-018-0568-5

[15] Neckel N, Lissat A, von Stackelberg A, Thieme N, Doueiri M-S, Spors B, et al. Primary oral manifestation of Langerhans cell histiocytosis refractory to conventional therapy but susceptible to BRAF-specific treatment: a case report and review of the literature. Therapeutic Advances in Medical Oncology. 2019; 11: 1758835919878013. https://doi.org/10.1177/1758835919878013

[16] Haupt R, Minkov M, Astigarraga I, Schäfer E, Nanduri V, Jubran R, et al. Langerhans cell histiocytosis (LCH): guidelines for diagnosis, clinical work‐up, and treatment for patients till the age of 18 years. Pediatric blood & cancer. 2013; 60(2): 175-84. https://doi.org/10.1002/pbc.24367

Biography

Nesa Rasooli is an undergraduate student at the School of Dentistry, Urmia University of Medical Sciences, Urmia, Iran. She has contributed to clinical research in oral and maxillofacial surgery, including case studies on rare conditions such as Langerhans Cell Histiocytosis. Nesa is involved in manuscript preparation, data collection, and analysis. She aims to further her expertise in dental research and pathology, with a focus on improving diagnosis and treatment of uncommon oral disorders.

Research Field

Samira Mostafazadeh: Langerhans cell histiocytosis, Oral and maxillofacial lesions, Pediatric oral diseases, Geriatric oral diseases, Case reports, Clinical diagnosis, Targeted therapy, Jaw pathology

Masoud Fallahi Motlagh: Oral and maxillofacial surgery, Mandibular reconstruction, Surgical case management, Pediatric surgery, Adult jaw surgery, Clinical procedures, Surgical planning

Nesa Rasooli: Oral pathology, Histopathology, Immunohistochemistry, Diagnosis of jaw lesions, Clonal cell proliferation, Tissue analysis, Laboratory investigation