



Original Article

Management of cervical lymphadenopathy with dental caries

Dr. Kalpana Sharma¹, Dr. Purabi Doley², Dr. Sunita Das³, Dr. Praveen Kumar Maurya⁴, Dr. Byapti Dutta⁵

¹Professor & Hod, Dept Of Ent, Gauhati Medical College & Hospital, Guwahati, Assam, India.

²Post Graduate Trainee, Dept Of Ent, Gauhati Medical College & Hospital, Guwahati, Assam, India.

³Registrar, Dept Of Ent, Gauhati Medical College & Hospital, Guwahati, Assam, India.

⁴Post Graduate Trainee, Dept Of Ent, Gauhati Medical College & Hospital, Guwahati, Assam, India.

⁵Post Graduate Trainee, Dept Of Ent, Gauhati Medical College & Hospital, Guwahati, Assam, India.

 OPEN ACCESS

Corresponding Author:

Dr. Purabi Doley

Post Graduate Trainee, Dept Of
Ent, Gauhati Medical College &
Hospital, Guwahati, Assam,
India.

Email:

purabidoley.96@gmail.com

Received: 16-04-2026

Accepted: 02-05-2026

Published: 06-05-2026

Copyright© International Journal of
Medical and Pharmaceutical Research

ABSTRACT

Cervical lymphadenopathy is a common clinical finding in the head and neck region, often observed in more than half of patients presenting to outpatient departments. The majority of these cases are benign and infectious in origin. Patients presenting with unexplained, localized cervical lymphadenopathy and benign clinical features are typically monitored for a period of two to four weeks.

This study presents a case series of 100 patients who reported to the Department of ENT at GMCH with complaints of neck swelling associated with dental caries. The findings indicate that cervical lymphadenopathy was most prevalent among patients over 41 years of age, with a higher incidence observed in males. Appropriate diagnostic evaluations and timely interventions were undertaken to ensure effective management.

Methods: A one year prospective study was performed .

Results: The majority of patients in this study were aged over 41 years (n = 44), followed by 24 patients aged 31–40 years and 20 patients aged 21–30 years. Fewer cases were observed in younger age groups: 7 patients aged 11–20 years and 5 patients aged 1–10 years. A male predominance was noted, with 68% of the study population being male and 32% female.

Hospital stay duration was generally longer in patients with co-morbidities. Among males, 28 patients with co-morbidities had hospital stays exceeding 3–4 weeks, while 40 without co- morbidities stayed less than 3 weeks. Similarly, 13 females with co-morbidities had prolonged hospitalization, compared to 19 without co-morbidities.

Microbiological analysis revealed that Staphylococcus (24%) and Streptococcus (14%) were the most commonly isolated organisms. Candidiasis (2%) and E. coli (1%) were less frequent, while Pseudomonas was not detected. No microbial growth was found in 59% of the cases.

Keywords: Cervical lymphadenopathy, Dental caries, Periapical abscess, Odontogenic infection, Neck swelling.

INTRODUCTION

Cervical lymphadenopathy refers to the abnormal enlargement of lymph nodes located in the cervical region and is frequently associated with a wide range of pathological conditions, including infectious, inflammatory, autoimmune, and neoplastic processes. Among the infectious causes, odontogenic infections represent a significant contributor, particularly in populations with limited access to dental care or poor oral hygiene, & other causes are bacterial, viral, fungal, mycobacterial, parasitic.

Dental pathologies such as dental caries, periodontitis, periapical abscesses, and acute or chronic oral infections can lead to the translocation of bacteria and other pathogens into the periapical and periodontal tissues. From these sites, microorganisms—most commonly aerobic and anaerobic bacteria, including Streptococcus and Fusobacterium species—may invade the surrounding vasculature and lymphatic drainage pathways. Cervical lymph nodes serve as critical immunological checkpoints, responsible for filtering lymphatic fluid and initiating immune responses against microbial antigens . The invasion stimulates a local immune response characterized by the activation of resident macrophages and dendritic cells, followed by the recruitment of lymphocytes and neutrophils, culminating in lymph node enlargement.

The enlargement of these nodes in response to dental infections typically reflects reactive hyperplasia, a benign but clinically significant manifestation of heightened immune activity. In some cases, especially in immunocompromised individuals or in the setting of untreated or severe dental infections, lymphadenitis may progress to suppuration or abscess formation.

Diagnosis relies on a comprehensive clinical assessment, including dental examination, history of recent oral infections, and, when indicated, imaging studies such as ultrasonography or contrast-enhanced CT. In ambiguous cases or when malignancy cannot be excluded, fine-needle aspiration cytology (FNAC) or lymph node biopsy may be warranted.

Early recognition of the dental origin of cervical lymphadenopathy is crucial for targeted intervention. Management typically involves addressing the underlying dental infection through appropriate antimicrobial therapy, drainage of abscesses, or definitive dental procedures such as root canal treatment or extraction. Failure to treat the primary source may result in persistent lymphadenopathy, systemic spread, or complications such as deep neck space infections, Ludwig angina.

Patients presenting with cervical lymphadenopathy due to dental infections often exhibit localized clinical signs, such as pain, tenderness, warmth, and swelling over the affected lymph nodes. These manifestations may be accompanied by trismus, odynophagia, or intraoral swelling, depending on the extent and location of the dental pathology. In many cases, systemic signs of infection—including fever, chills, malaise, and elevated inflammatory markers—may also be present, particularly in moderate to severe infections.

There are no proper written guidelines for the evaluation of cervical lymphadenopathy in a case of dental caries.

METHODOLOGY

Study Design

This was a prospective observational study conducted to evaluate the association between dental infections and cervical lymphadenopathy.

Study Population

The study included patients who presented with cervical lymphadenopathy and received treatment at the Department of Otorhinolaryngology (ENT) in a tertiary care hospital.

Study Duration

The study was conducted over a period of one year.

Inclusion Criteria

- Cases diagnosed with cervical lymphadenopathy.
- Presence of dental caries confirmed on clinical or radiological evaluation.
- Cases with dental caries and associated comorbidities (e.g., diabetes mellitus).
- Cases who are willing to participate in the study and given written consent.

Exclusion Criteria

- Cases presenting with cervical lymphadenopathy without evidence of dental caries
- Cervical lymphadenopathy due to TB, Non odontogenic and Malignancy
- Cases who not given consent.

MATERIALS AND METHODS

All patients underwent a thorough history and clinical examination, followed by appropriate diagnostic investigations, including:

- Routine blood investigations like Complete blood count, coagulation profile
- Ultrasonography (USG) of the neck to assess lymph node characteristics
- Orthopantomogram (OPG) X-ray to identify and evaluate dental caries and periapical pathology.
- Fine Needle Aspiration Cytology (FNAC) for cytological evaluation of enlarged lymph nodes.
- Management: Broad spectrum (specific) antibiotics, incision drainage, tooth extraction and where oral intake is compromised due to trismus or odynophagia, nutritional support through Ryle's tube feeding whenever necessary.
- Ethical Considerations: All patients provided informed consent to participate in the study and used their clinical data and images. The study was conducted using ethical guidelines and approved by institutional review board of Gauhati Medical College and Hospital .

RESULT

The distribution of cases across different age groups revealed that the majority of patients were aged over 41 years, accounting for 44 cases. This was followed by 24 patients in the 31–40 year age group and 20 patients in the 21–30 year group. The number of cases was comparatively lower among younger individuals, with 7 cases in the 11–20 year group

and 5 cases in the 1–10 year group. Out of the total study population, 68 patients (68%) were male and 32 patients (32%) were female, indicating a male predominance in the occurrence of cervical lymphadenopathy associated with dental infections.

A review of hospitalization data revealed that male patients with co-morbidities (n = 28) tended to have longer hospital stays, typically lasting more than 3 to 4 weeks. In contrast, male patients without co-morbidities (n = 40) generally experienced shorter hospital stays, lasting less than 3 weeks.

Similarly, among female patients, those with co-morbidities (n = 13) were hospitalized for more than 3 to 4 weeks, while female patients without co-morbidities (n = 19) had shorter hospital stays of less than 3 weeks.

A total of 100 samples were analyzed for microbial growth. Staphylococcus was the most frequently isolated organism, detected in 24 cases (24%). Streptococcus was identified in 14 cases, accounting for 14% of the total. Candidiasis was found in 2 cases (2%), while E. coli was present in only 1 case (1%). Pseudomonas was not detected in any of the samples (0%). Notably, no microbial growth was observed in 59 of the samples, representing the highest proportion at 59%.

Ultrasonographic evaluation of the 100 patients revealed that 70% had cervical lymphadenopathy involving the submandibular lymph nodes. Of these, 45 cases presented with swelling on the right side, and 25 cases on the left side. The long-axis diameter of the lymph nodes varied, with 22 cases measuring 1–3 mm, 68 cases measuring 3–6 mm, and 10 cases exceeding 6 mm in size.

The remaining 30 cases showed involvement of the submental lymph nodes.

Clinically, the majority of patients exhibited submandibular lymph node enlargement, which was characteristically tender, firm, non-adherent to overlying skin, and had regular margins— features consistent with reactive inflammatory lymphadenopathy.

Table 1 showing the distribution of case as per demographic, hospitalisation, microbial finding and USG Finding.

Table 1 : Summary of Demographic, Clinical, Microbiological, and Ultrasonographic Findings (n = 100)

Parameter	Category/Subgroup	Number of Cases	Percentage (%)
Age Distribution	1–10 years	5	5%
	11–20 years	7	7%
	21–30 years	20	20%
	31–40 years	24	24%
	>41 years	44	44%
Sex Distribution	Male	68	68%
	Female	32	32%
Hospital Stay	Males with co-morbidity	28	—
	Males without co-morbidity	40	—
	Females with co-morbidity	13	—
	Females without co-morbidity	19	—
Hospitalization Duration	>3–4 weeks (with co- morbidity)	41 (total)	41%
	<3 weeks (without co- morbidity)	59 (total)	59%
Microbiological Findings	Staphylococcus spp.	24	24%
	Streptococcus spp.	14	14%
	Candida spp.	2	2%
	Escherichia coli	1	1%
	Pseudomonas spp.	0	0%
	No growth	59	59%
Lymph Node Location (USG)	Submandibular nodes (Total)	70	70%
	↳ Right side	45	45% (of total)
	↳ Left side	25	25% (of total)
	Submental nodes	30	30%
Lymph Node Size (mm)	1–3 mm	22	22%
	3–6 mm	68	68%
	>6 mm	10	10%

Case 1 (A) : Clinical photograph of a 38-year-old female presenting with a painless right-sided cervical swelling of six days' duration. The patient had a known history of type 2 diabetes mellitus. Oral examination and orthopantomogram (OPG) imaging revealed dental caries involving the lower right first and second molars (teeth 30 and 31). Following extraction of the affected teeth under appropriate antibiotic coverage and glycemic control, the cervical swelling resolved over three weeks. Figure 1 (a-c)

Case 1 (B) : A 36-year-old male with a history of type 2 diabetes mellitus presented with a painful swelling in the right parotid region of 15 days' duration. Clinical examination revealed dental caries involving the lower right second molar (tooth 31). Ultrasonography confirmed a right-sided parotid abscess. Under adequate antibiotic coverage and glycemic control, surgical drainage of the abscess and extraction of the involved tooth were performed. The swelling resolved fully within four weeks. Figure 1 (d & e).

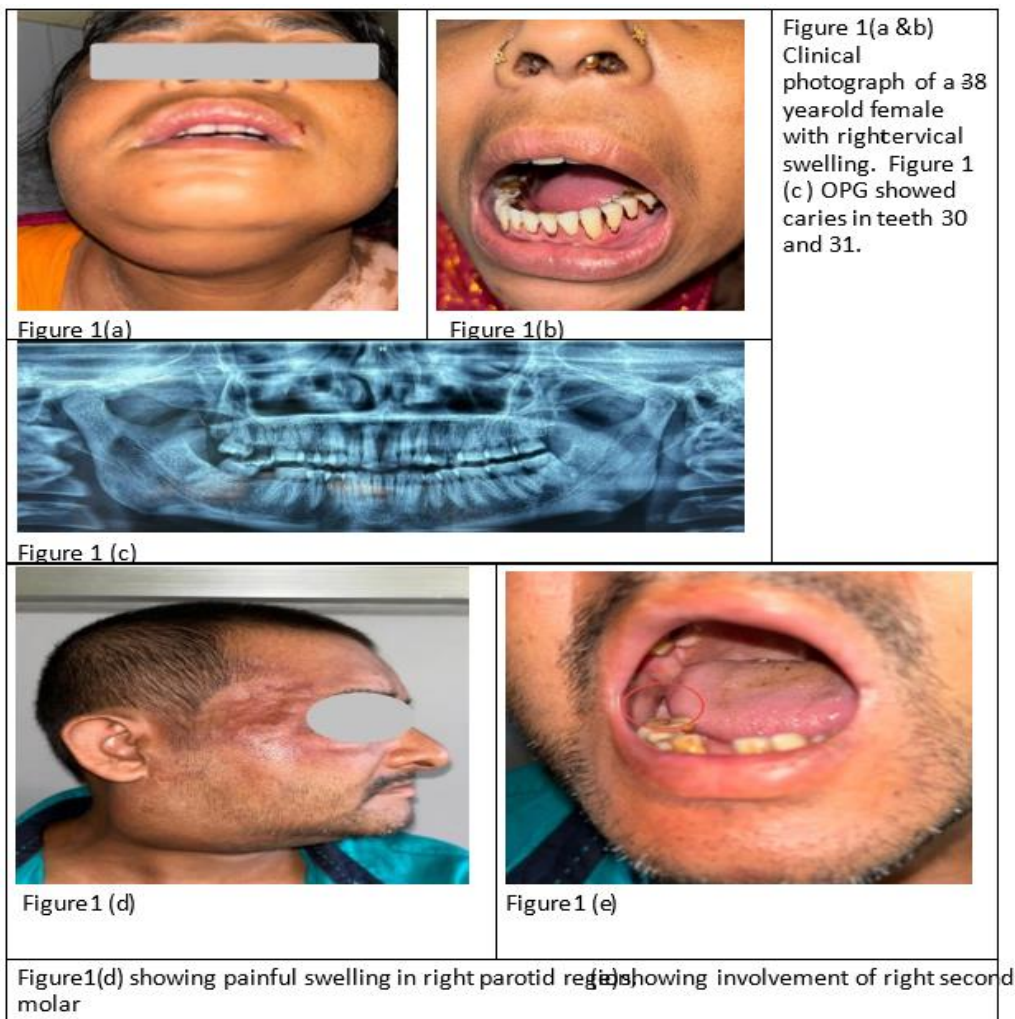


Figure 1 Showing Case 1 A & B

Case 2 (A): A 9-year-old female presented with a painful swelling on the left side of the neck, persisting for seven days. Oral examination revealed dental caries involving the lower left second premolar (tooth 29). The swelling progressed to a localized abscess. Management included empirical broad-spectrum antibiotic therapy, surgical drainage of the abscess, and extraction of the affected tooth. The intervention led to clinical resolution. Figure 2 (a & b).

Case 2(B) : A 37-year-old male with type 2 diabetes mellitus presented with a painful, inflamed ulcer on the left side of the neck for 14 days. Dental examination revealed caries in the lower third molars, which had led to the development of a neck abscess. Management included drainage of the abscess, extraction of the affected teeth, and stabilization of blood glucose levels. The patient responded well to the treatment. Figure 2 (c & d)



Figure 2 (a)



Figure 2 (b)

Figure 2 (a) showing left side painful neck ulcer , 2 (b) showing left side lower second premolar caries



Figure 2 (c)



Figure 2 (d)

Figure 2 (c) showing left side neck ulcer, (d) showing lower third molar caries

Figure 2 showing Case 2 A & B

Case 3 A : A 36-year-old female presented with an 8-day history of painful swelling on the left side of the neck. Oral examination revealed dental caries involving the left lower second premolar. Despite initial management with appropriate antibiotic coverage, the swelling progressed to abscess formation within 4–5 days. Definitive treatment included extraction of tooth along with surgical incision and drainage of the abscess, leading to gradual clinical improvement. Figure 3 (a & b)

Case 3 B : An 18-year-old female presented with a painful swelling of floor of the mouth and neck, persisting for 10 days. Clinical examination identified dental caries involving the right lower second molar. Despite initiation of appropriate antibiotic therapy, the lesion progressed to abscess formation within 4–5 days. The patient subsequently underwent extraction of the affected tooth, followed by surgical incision and drainage of the abscess under antibiotic coverage. The intervention led to a gradual resolution of the swelling. Figure 3 (d & e)



Figure 3 showing Case 3 A & B

DISCUSSION

Cervical lymphadenopathy is a common clinical finding with a broad differential diagnosis. Among the many causes, dental infections represent a prevalent and clinically significant etiology, particularly when lymph node enlargement is localized, tender, and associated with oral signs or symptoms. Increased awareness among dental and medical professionals is essential to ensure timely diagnosis, appropriate referral, and effective treatment of these cases.

Painful cervical swelling is frequently encountered in association with dental caries. Accurate diagnosis begins with a detailed clinical history, focusing on the location, duration, progression, and accompanying symptoms of the lesion. This approach is essential to distinguish odontogenic causes from other potential etiologies of cervical lymphadenopathy.

In this study, 41% of patients had coexisting type 2 diabetes mellitus—an established comorbidity that compromises immune function and delays healing. These patients experienced prolonged hospitalizations (>3 weeks) and required endocrinology consultation for glycemic control using insulin or oral hypoglycemic agents (OHAs). Conversely, 59% of patients without comorbidities had hospital stays of less than three weeks, suggesting a more favorable prognosis. Advanced age (>50 years) was also associated with longer recovery times and extended hospital stays, underscoring the influence of systemic health and age on treatment outcomes and disease progression.

All patients received standardized clinical evaluations, including imaging and laboratory investigations. Empirical broad-spectrum antibiotics were administered initially, and in cases of purulent discharge, samples were collected for culture and sensitivity. Antibiotic therapy was adjusted accordingly based on microbiological findings to ensure targeted, effective management.

Microbiological analysis revealed *Staphylococcus* and *Streptococcus* species as the most frequently isolated organisms—both consistent with the typical oral flora in dental infections. *Escherichia coli* was found in one case, and *Candida* species in two cases, suggesting possible opportunistic infections. A significant number of cultures showed no microbial growth, likely due to prior empirical antibiotic use at peripheral health centers before referral.

In a number of neglected cases, patients presented with trismus and dysphagia, alongside extensive skin ulceration complicated by myiasis and anemia. While most patients responded well to appropriate medical and surgical management, one case resulted in mortality despite comprehensive intervention.

All patients were found to have underlying dental caries, warranting timely dental consultation and intervention. Management strategies included broad spectrum antibiotics, incision & drainage, extraction of the affected teeth, Ryle’s tube feeding for nutritional support and also split-thickness skin grafting for patients presenting with extensive neck ulcers. These multidisciplinary interventions led to significant clinical improvement, with resolution of cervical lymphadenopathy observed in most cases, underscoring the critical role of integrated dental and medical care.

Complications and Public Health Implications

Cervical lymphadenopathy of odontogenic origin remains under-recognized, despite its potential to cause severe complications. If untreated, such infections can extend beyond local tissues, invading deep fascial spaces of the neck and leading to conditions like submandibular or sublingual space infections, cervical cellulitis with skin ulcers, or suppurative lymphadenitis. A particularly serious consequence is Ludwig’s angina—a bilateral, rapidly progressing infection of the submandibular space that can lead to airway compromise.

In immunocompromised individuals or in cases of delayed treatment, the risk of systemic spread increases, potentially resulting in sepsis, mediastinitis, or intracranial infections via venous pathways such as the facial and pterygoid plexuses. Early diagnosis and appropriate intervention are therefore critical to avoid life-threatening complications.

Despite the clinical relevance, literature on the specific relationship between dental infections and cervical lymphadenopathy remains limited. More epidemiological and microbiological studies are needed to expand our understanding of this association and to guide optimized treatment strategies. Comparative studies from the previous studies were given below in table 2

Parameter	Current Study, 2025 (n=100)	Bagci et al., 2024 (n=150)	Reshma et al., 2014 (n=52)	Iqbal et al., 2010 (n=100)
Study Design	Prospective, observational	Clinical and ultrasonographic study	Clinical and ultrasonographic study	Retrospective study
Primary Etiology	Dental caries / Odontogenic infections	Odontogenic infections	Odontogenic infections (caries, gingivitis, abscesses, periodontitis)	Tuberculosis (70.45%)
Lymph Node Characteristics	Tender, firm, movable; submandibular and submental commonly affected	Increased number and size of submandibular lymph nodes	Tender, firm, movable; submandibular and submental predominant	Not specified
Diagnostic Tools Used	Clinical exam, imaging, lab tests, microbiological analysis	Clinical exam, ultrasonography	Clinical exam, ultrasonography	Clinical exam, FNAC
Microbial Findings	Staph (24%), Strep (14%), Candida (2%), E. coli (1%), No growth (59%)	Not specified	Not specified	Not specified
Age Group Most Affected	>41 years (44%)	18–30 years	>18 years	Not specified
Gender Distribution	Male predominance (68%)	Female: 57%, Male: 43%	Not specified	Not specified
Comorbidities Observed	Diabetes mellitus (41%)	Systemically healthy patients only	Not specified	Not specified

Hospital Stay Duration	>3 weeks in 41%, mostly diabetics	Not specified	Not specified	Not reported
Complications Noted	Deep neck space infections, Ludwig's angina	Not specified	Not specified	Not specified
Ultrasonographic Findings	Not specified	Significant enlargement and altered vascularity in submandibular nodes	Oval, hypoechoic nodes; visible hilum, unsharp borders	Not used

Table 2: Comparative Analysis of Cervical Lymphadenopathy Studies Conclusion

Cervical lymphadenopathy of odontogenic origin remains a clinically important yet frequently overlooked diagnosis. The findings from this study highlight dental caries as a prominent underlying cause, especially in individuals with systemic conditions such as type 2 diabetes mellitus. Timely recognition, coordination between dental and medical disciplines, and the use of appropriate antibiotic regimens are critical for effective management. The microbiological analysis most commonly revealed the presence of Streptococcus and Staphylococcus species; however, a notable number of negative cultures may be attributed to prior empirical antibiotic use before presentation. Collaborative care involving dental professionals and medical specialists, including endocrinologists when needed, contributed significantly to improved clinical outcomes and reduced hospitalization durations.

This study provides valuable insight into the evaluation and management of cervical lymphadenopathy of odontogenic origin. A thorough clinical examination should include inspection of all visible mucosal surfaces, accompanied by careful palpation of the floor of the mouth, tongue, retromolar trigone, and cervical region.

It is essential for oral and maxillofacial surgery (OMFS) professionals to possess comprehensive knowledge of the potential for odontogenic causes of cervical lymphadenopathy to ensure early and appropriate referral.

REFERENCES

1. Sghaier J, Slim A, Hamdi H. Cervical lymphadenopathy of dental origin. Monastir: Department of Medicine and Oral Surgery, University Dental Clinic, Tunisia.
2. Verma R, Khera S. Cervical lymphadenopathy of odontogenic origin: a clinical overview. New Delhi: Maulana Azad Institute of Dental Sciences.
3. Parisi E, Glick M. Cervical lymphadenopathy in the dental patient: a review of clinical approach. Quintessence Int. 2005 Jun;36(6):423–6. PMID: 15954248.
4. Iqbal M, Subhan A, Aslam A. Frequency of tuberculosis in cervical lymphadenopathy. J Surg Pak (Int). 2010;15(3):107–9.
5. Reshma VJ, Anwar SA, Mufeed A, Vadivazhagan, Issac JK. Characterization of cervicofacial lymph nodes—a clinical and ultrasonographic study. J Clin Diagn Res. 2014;8(9):ZC25–ZC38.
6. Bagci N, Peker I, Gündüz T. Evaluation of lymph node findings in patients with and without odontogenic infection: a clinical and ultrasonographic study. Med Oral Patol Oral Cir Bucal. 2024;29(2):e195–e202.
7. Topazian RG, Goldberg MH, Hupp JR. Oral and Maxillofacial Infections. 4th ed. Philadelphia: W.B. Saunders; 2002.
8. Scully C, Porter S. Orofacial disease: update for the dental clinical team: 11. Cervical lymphadenopathy. Dent Update. 2000 Jan–Feb;27(1):44–7. doi: 10.12968/denu.2000.27.1.44. PMID: 11218266.
9. Dangore-Khasbage S, Bhake AS. Cervical lymphadenopathy in a dental patient: an eye opener case report. Spec Care Dentist. 2019 Jan;39(1):59–64. doi: 10.1111/scd.12336. Epub 2018 Oct 31. PMID: 30379333.
10. Ludwig BJ, Wang J, Nadgir RN, Saito N, Castro-Aragon I, Sakai O. Imaging of cervical lymphadenopathy in children and young adults. Radiographics. [Year unknown; please provide volume and issue].
11. Ochicha O, Edino ST, Mohammed AZ, Umar AB, Atanda AT. Pathology of peripheral lymph node biopsies in Kano, Northern Nigeria. Ann Afr Med. 2007 Sep;6(3):104–8. doi: 10.4103/1596-3519.55725. PMID: 18240497.
12. Upadhyay N, Chaudhary A, Alok A. Cervical lymphadenopathy. J Dent Sci Oral Rehabil. 2012;3:30–3.