E-ISSN 2250-0944
ISSN 2250-1150
doi: 10.31838/ijprt/16.01.751

Research Article

A Clinical Study Evaluating the Diagnostic Challenges and Management Outcomes of Neck Masses in Adults with Special Reference to Occult Head and Neck Malignancies

Dr. Monish D U[1], Dr. Akshatha HS[2], Dr. Shreeshanand K[3*]
[1]Senior Resident Kodagu Institute of Medical Sciences, Madikeri.
[2]Assistant Professor Kodagu Institute of Medical Sciences, Madikeri.
[3*]Senior Resident Department of Community Medicine Kodagu Institute of Medical Sciences, Madikeri.
Corresponding Author: Dr. Shreeshanand K
Senior Resident Department of Community Medicine Kodagu Institute of Medical Sciences, Madikeri.
Received: 06.05.26, Revised: 06.06.26, Accepted: 16.06.26

ABSTRACT
Background: Adult neck masses have a broad etiological spectrum ranging from inflammatory and infectious conditions to benign and malignant neoplasms. Cervical lymphadenopathy may occasionally represent metastatic head and neck malignancy without an identifiable primary tumour, creating significant diagnostic and therapeutic challenges. The present study was undertaken to evaluate the clinical profile, diagnostic evaluation, etiological spectrum, occult malignancies, management modalities, and short-term outcomes of adult patients presenting with neck masses.
Materials and Methods: A prospective observational study was conducted in the Department of Otorhinolaryngology, Kodagu Institute of Medical Sciences, Madikeri, Karnataka, over a period of 6 months. A total of 64 adult patients aged ≥18 years presenting with newly detected neck masses or cervical lymphadenopathy were enrolled consecutively. Detailed history and clinical examination were followed by appropriate investigations including ultrasonography, fine-needle aspiration cytology (FNAC), contrast-enhanced computed tomography (CECT), magnetic resonance imaging (MRI), endoscopic evaluation, biopsy, histopathological examination, and immunohistochemistry where indicated. Patients with suspected occult malignancy underwent systematic evaluation for identification of the primary site. Management and clinical outcomes were assessed at the end of the study period.
Results: Among 64 patients, 39 (60.9%) were males, and 25 (39.1%) were females, with a mean age of 48.2 ± 15.1 years. Painless neck swelling was the commonest presentation, observed in 48 (75.0%) patients. Cervical lymphadenopathy constituted the predominant anatomical presentation in 45 (70.3%) patients. Tobacco use was reported in 23 (35.9%) and alcohol consumption in 18 (28.1%) patients. FNAC was performed in 58 (90.6%) patients, ultrasonography in 51 (79.7%), and CECT neck in 39 (60.9%). Malignant lesions constituted the largest final diagnostic category, accounting for 25 (39.1%) patients. Of these, 20 (80.0%) had metastatic cervical malignancy and 5 (20.0%) had primary malignant lesions. The primary tumour was identified in 16 of the 20 metastatic cases, while 4 (20.0%) had an occult primary, representing 6.3% of the total study population. Major diagnostic challenges included difficulty identifying the primary site, inadequate or inconclusive FNAC, requirement for repeat tissue sampling, and clinical-radiological/cytological discordance. At the end of the study period, 36 (56.3%) patients showed complete or significant clinical improvement, while 10 (15.6%) had persistent disease and 12 (18.8%) required further treatment or oncological referral.
Conclusion: Adult neck masses have a diverse etiological spectrum, with malignancy constituting a substantial proportion of cases. Cervical lymphadenopathy was the predominant presentation, and metastatic malignancy accounted for most malignant lesions. Occult primary malignancy represented an important diagnostic challenge. A systematic approach incorporating clinical examination, FNAC, appropriate imaging, endoscopic evaluation, and histopathological assessment is essential for timely diagnosis and appropriate management. Multidisciplinary evaluation is particularly important in patients presenting with metastatic cervical disease without an identifiable primary tumour.

Keywords: Adult Neck Mass, Cervical Lymphadenopathy, Fnac, Head and Neck Malignancy, Metastatic Carcinoma, Occult Primary, Diagnostic Evaluation, Treatment Outcome.

INTRODUCTION

A neck mass in an adult is a common clinical presentation with a broad differential diagnosis

ranging from inflammatory and infectious disorders to benign and malignant neoplasms. Although many neck swellings are ultimately found to be benign, a persistent or unexplained neck mass in an adult should be evaluated carefully because it may represent the first or only clinically evident manifestation of an underlying head and neck malignancy. In particular, cervical lymph-node metastasis may precede identification of the primary tumour. The American Academy of Otolaryngology–Head and Neck Surgery recommends prompt and structured evaluation of adult neck masses that have features suggestive of malignancy, with appropriate clinical examination, imaging and tissue diagnosis.[1,2]

The etiological spectrum of adult neck masses includes reactive lymphadenopathy, bacterial and granulomatous infections, thyroid and salivary-gland lesions, congenital lesions presenting in adulthood, benign tumours, lymphoma, primary head and neck malignancies and metastatic carcinoma. The diagnostic approach therefore requires integration of the patient's age, duration and characteristics of the swelling, associated symptoms, exposure to tobacco and alcohol, physical examination findings and anatomical distribution of the lesion. Features such as firmness, fixation, progressive enlargement and associated constitutional or upper aerodigestive tract symptoms increase the suspicion of malignancy.[1]

Cervical lymphadenopathy is particularly important because metastatic squamous cell carcinoma of the upper aerodigestive tract may present without an obvious mucosal primary. In such patients, the cervical node may be the initial clinical manifestation of an otherwise clinically occult tumour. The diagnostic evaluation generally includes careful examination of the oral cavity, oropharynx, hypopharynx and larynx, imaging of the neck, fine-needle aspiration cytology (FNAC), and further endoscopic or tissue evaluation when required.[1,3]

FNAC is an important first-line tissue investigation in adults with a suspicious neck mass because it can provide a diagnosis while avoiding the morbidity associated with an initial open biopsy. However, inadequate or indeterminate cytological material, lymphoma, complex nodal disease and discordance between cytological and radiological findings may necessitate repeat sampling, core biopsy or excisional biopsy.[1,4]

Imaging plays an important complementary role in determining the extent and anatomical characteristics of the lesion. Ultrasonography is particularly useful for superficial masses and cervical lymph nodes, whereas contrast-enhanced computed tomography (CECT) and magnetic resonance imaging (MRI) provide information regarding deep-space involvement, nodal morphology, adjacent structures and possible primary lesions. In patients with cervical metastatic squamous cell carcinoma and an unknown primary, more advanced imaging such as FDG-PET/CT may further improve detection of clinically occult disease. Recent evidence suggests that PET/CT has an important role in the evaluation of carcinoma of unknown primary, particularly when conventional examination and CT/MRI do not identify the source.[3,5]

Occult head and neck malignancy represents a particularly challenging diagnostic problem. It is generally defined by the presence of metastatic disease, usually within cervical lymph nodes, when an appropriate clinical, radiological and pathological evaluation fails to identify the primary tumour. The tonsillar region and base of tongue are important potential sites in patients with metastatic squamous cell carcinoma of unknown primary.[3,6] The UK National Multidisciplinary Guidelines recommend systematic evaluation with PET/CT, panendoscopy with directed biopsies and tonsillar assessment in appropriately selected patients with confirmed cervical metastatic squamous cell carcinoma and no apparent primary site.[5]

The management of adult neck masses depends on the final diagnosis and disease extent. Infective and inflammatory lesions are generally treated medically, while benign neoplasms may require observation or surgical excision. Malignant lesions require site- and stage-specific management, which may include surgery, radiotherapy, chemotherapy or combined treatment. For metastatic cervical malignancy from an unknown primary, treatment decisions depend on nodal stage, histopathology, suspected site of origin and multidisciplinary assessment. Despite advances in diagnostic imaging and endoscopic techniques, carcinoma of unknown primary remains a clinically challenging entity.[5–7]

The present prospective study was therefore undertaken to evaluate the clinical profile and etiological spectrum of adult neck masses, assess the diagnostic yield and challenges associated with FNAC, imaging, endoscopic evaluation and histopathology, identify the

frequency of occult head and neck malignancy, and assess the management modalities and short-term clinical outcomes of affected patients.

MATERIALS AND METHODS

Study Design and Study Setting

The present study was undertaken as a prospective observational clinical study to evaluate the clinical profile, diagnostic challenges, etiological spectrum, investigative findings, management modalities, and treatment outcomes among adult patients presenting with neck masses, with particular emphasis on the detection and management of occult head and neck malignancies.

The study was conducted in the Department of Otorhinolaryngology (ENT), Kodagu Institute of Medical Sciences, Madikeri, Karnataka. The study was carried out over a period of 6 months. Approximately 64 patients fulfilling the predefined eligibility criteria were enrolled consecutively during the study period.

Study Population

The study population comprised adult patients presenting to the ENT outpatient department or inpatient services with a newly detected neck mass or cervical swelling requiring clinical evaluation.

Each patient underwent a systematic diagnostic assessment beginning with detailed history and physical examination, followed by appropriate laboratory investigations, imaging, cytological examination, histopathological examination, and endoscopic evaluation wherever clinically indicated. The final diagnosis was established based on the combined clinical, radiological, cytological, histopathological, and endoscopic findings.

Sample Size

A total of 64 adult patients presenting with neck masses and fulfilling the inclusion and exclusion criteria were included in the study.

Inclusion Criteria

Patients meeting the following criteria were eligible for inclusion:

1. Patients aged 18 years or above.
2. Patients presenting with a newly detected neck mass or cervical lymphadenopathy.
3. Patients with neck masses of suspected inflammatory, infective, congenital, benign neoplastic, metastatic, or malignant aetiology.
4. Patients requiring further diagnostic evaluation based on clinical assessment.
5. Patients willing to undergo appropriate investigations and treatment.
6. Patients providing written informed consent for participation.

Exclusion Criteria

The following patients were excluded:

1. Patients aged below 18 years.
2. Patients with a previously diagnosed and treated head and neck malignancy presenting for follow-up.
3. Patients with an already established primary malignancy and previously confirmed cervical metastasis.
4. Patients with a neck swelling clearly attributable to acute trauma.
5. Patients unwilling to undergo further diagnostic evaluation.
6. Patients who refused consent for participation.
7. Patients with inadequate clinical or diagnostic information preventing establishment of a final diagnosis.

Clinical Assessment

A detailed history was obtained from every participant using a structured study proforma. Information regarding age, sex, duration of swelling, site of swelling, progression, pain, fever, dysphagia, odynophagia, dysphonia, dyspnea, weight loss, loss of appetite, constitutional symptoms, and other associated complaints was recorded.

Relevant risk factors were documented, including smoking, tobacco chewing, alcohol consumption, betel nut use, previous head and neck lesions, dental disease, recurrent infections, and relevant medical history.

A comprehensive ENT examination was performed. The neck mass was assessed with respect to site, size, number, shape, consistency, tenderness, mobility, fixation, overlying skin changes, and relationship to surrounding structures. The cervical lymph-node levels involved were documented wherever applicable.

A complete examination of the oral cavity, oropharynx, nasopharynx, hypopharynx, and larynx was performed to identify a possible primary lesion. Particular attention was given to clinical features suggestive of malignancy, including a hard or irregular mass, fixation to surrounding structures, progressive enlargement, multiple cervical lymph nodes, unexplained weight loss, mucosal abnormalities, and persistent cervical lymphadenopathy without an obvious primary

lesion.

Initial Diagnostic Evaluation

The diagnostic evaluation was individualized according to the clinical presentation and suspected aetiology. Baseline laboratory investigations were performed where clinically indicated.

The diagnostic work-up included one or more of the following:

- Ultrasonography of the neck.
- Fine-needle aspiration cytology (FNAC).
- Contrast-enhanced computed tomography (CECT) of the neck.
- Magnetic resonance imaging (MRI), where indicated.
- Endoscopic evaluation of the upper aerodigestive tract.
- Incisional or excisional biopsy.
- Histopathological examination.
- Immunohistochemistry in selected cases.

The sequence of investigations and the time required to reach the final diagnosis were documented to assess the diagnostic challenges associated with adult neck masses.

Fine-Needle Aspiration Cytology

FNAC was performed in patients with accessible cervical masses or lymph nodes. The cytological findings were interpreted and categorised into appropriate diagnostic groups, including reactive/inflammatory lesions, granulomatous lesions, benign neoplasms, metastatic malignancy, lymphoproliferative lesions, and other pathological conditions.

Cases with inadequate, suspicious, or inconclusive cytological findings underwent further evaluation with repeat FNAC, core biopsy, excision biopsy, or other appropriate diagnostic procedures.

Radiological Evaluation

Ultrasonography was used as an initial imaging modality in selected patients, particularly for superficial neck masses and cervical lymphadenopathy.

CECT of the neck was performed when a detailed assessment of the mass, cervical lymph nodes, deep neck spaces, adjacent structures, or possible primary lesion was required. MRI was performed in selected cases where better soft-tissue characterisation or assessment of specific anatomical regions was necessary.

Radiological parameters recorded included site and size of the lesion, number and distribution of lymph nodes, nodal morphology, central necrosis, calcification, extranodal extension, involvement of adjacent structures, and evidence of a possible primary tumour.

Evaluation of Suspected Occult Head and Neck Malignancy

Patients presenting with cervical lymphadenopathy in whom metastatic malignancy was suspected but in whom no primary tumour was identified on routine clinical examination were evaluated for an occult head and neck primary.

A systematic search for the primary site was undertaken using appropriate combinations of detailed ENT examination, flexible or rigid endoscopy, imaging, FNAC, biopsy, and histopathological examination.

When clinically indicated, direct laryngoscopy/panendoscopy with directed biopsies from suspicious mucosal sites was performed. Histopathological examination and immunohistochemical studies were undertaken in selected cases to assist in determining the likely primary site.

An occult primary malignancy was considered when cervical metastatic disease was established histologically or cytologically, but the primary tumour could not be identified despite appropriate clinical, endoscopic, and radiological evaluation.

Histopathological Examination

Patients requiring definitive tissue diagnosis underwent incisional biopsy, excisional biopsy, or other appropriate tissue sampling. Specimens were processed and examined using standard histopathological techniques.

The final diagnoses were categorised into:

1. Inflammatory/infective lesions.
2. Benign neoplastic lesions.
3. Primary malignant lesions.
4. Metastatic malignant lesions.
5. Lymphoproliferative malignancies.
6. Other pathological conditions.

For malignant lesions, the histological type and relevant pathological characteristics were documented.

Diagnostic Challenges

The diagnostic challenges encountered during the evaluation of each patient were recorded. These included:

- Nonspecific clinical presentation.
- Difficulty differentiating benign and malignant lesions clinically.
- Inadequate or inconclusive FNAC.

- Discordance between clinical, cytological, and radiological findings.
- Requirement for repeat investigations or tissue biopsy.
- Difficulty in identifying the primary site.
- Presentation with cervical metastasis without an identifiable primary tumour.
- Delay in establishing the definitive diagnosis.

The number and type of investigations required before establishing the final diagnosis were also recorded.

Management

Treatment was planned according to the final diagnosis, disease extent, anatomical site, clinical condition, and standard treatment principles.

Patients with inflammatory or infective lesions were managed with appropriate medical treatment and supportive measures. Benign lesions were managed conservatively or surgically depending on the nature, size, symptoms, and clinical indication.

Patients with confirmed malignancy were managed through appropriate surgical, radiotherapeutic, chemotherapeutic, or combined treatment modalities according to disease characteristics. Patients with metastatic cervical lymphadenopathy were evaluated and managed according to the identified primary site. Patients with an occult primary were managed according to the most likely primary site, histopathological findings, nodal disease, and multidisciplinary clinical assessment.

Assessment of Treatment Outcomes

Treatment outcomes were assessed clinically at the end of the study period. The outcome parameters included:

- Resolution or reduction of the neck mass.
- Persistence or progression of disease.
- Response to treatment.
- Recurrence where applicable.
- Treatment-related complications.
- Requirement for additional treatment.
- Referral for specialised oncological management.
- Death, where applicable.

For patients with malignancy, the treatment received and clinical status at the end of the study period were documented.

Data Collection

All relevant information was recorded in a structured data collection proforma. The variables included demographic characteristics, presenting symptoms, duration and characteristics of neck mass, risk factors, clinical examination findings, laboratory investigations, FNAC findings, imaging findings, endoscopic findings, histopathological diagnosis, presence or absence of an occult primary, treatment modality, complications, and clinical outcome.

Statistical Analysis

The collected data were entered into Microsoft Excel and analysed using appropriate statistical methods. Categorical variables were presented as frequency and percentage, while continuous variables were expressed as mean ± standard deviation or median with interquartile range, depending on the distribution of data.

Associations between categorical variables were assessed using the Chi-square test or Fisher's exact test, as appropriate. Continuous variables were compared using the Student's t-test or Mann–Whitney U test, depending on data distribution.

Where appropriate, diagnostic parameters such as the proportion of malignant lesions, frequency of occult primary malignancy, diagnostic yield of FNAC, and relationship between clinical/radiological features and final diagnosis were analysed. A p-value <0.05 was considered statistically significant.

Ethical Considerations

The study was conducted after obtaining approval from the Institutional Ethics Committee of Kodagu Institute of Medical Sciences, Madikeri. Written informed consent was obtained from all participants before enrollment.

Patient identity and confidentiality were maintained throughout the study. All investigations and treatment decisions were made according to standard clinical practice, and participation in the study did not interfere with the patient's appropriate clinical management.

RESULTS AND OBSERVATIONS

During the 6-month study period, a total of 64 adult patients presenting with neck masses were enrolled in the study. All patients underwent detailed clinical assessment followed by appropriate diagnostic investigations, including FNAC, ultrasonography, CECT/MRI, endoscopic evaluation, and histopathological examination wherever clinically indicated. The final diagnosis was established by correlating

clinical, radiological, cytological, endoscopic, and histopathological findings.

Demographic Characteristics

Among the 64 patients, 39 (60.9%) were males, and 25 (39.1%) were females, with a male-to-female ratio of 1.56:1. The age of the patients ranged from 18 to 78 years, with a mean age of 48.2 ± 15.1 years.

The largest proportion of patients belonged to the 41–50 years age group.

Table 1. Age and Sex Distribution of Study Participants (n=64)

Age group (years)	Male n (%)	Female n (%)	Total n (%)
18–30	5 (7.8)	4 (6.3)	9 (14.1)
31–40	6 (9.4)	4 (6.3)	10 (15.6)
41–50	11 (17.2)	7 (10.9)	18 (28.1)
51–60	8 (12.5)	5 (7.8)	13 (20.3)
61–80	9 (14.1)	5 (7.8)	14 (21.9)
Total	**39 (60.9)**	**25 (39.1)**	**64 (100)**

Clinical Presentation

The most common presenting complaint was painless neck swelling, reported by 48 (75.0%) patients. Pain was present in 21 (32.8%) patients, while fever was reported by 14 (21.9%). Weight loss was present in 15 (23.4%) patients.

Among upper aerodigestive tract symptoms, dysphagia was observed in 12 (18.8%), odynophagia in 8 (12.5%), and change in voice in 7 (10.9%) patients.

Table 2. Presenting Symptoms and Clinical Features

Clinical feature	Number (n=64)	Percentage (%)
Painless neck swelling	48	75.0
Pain	21	32.8
Fever	14	21.9
Weight loss	15	23.4
Loss of appetite	11	17.2
Dysphagia	12	18.8
Odynophagia	8	12.5
Change in voice	7	10.9
Dyspnea	4	6.3

Multiple symptoms could be present in the same patient.

Risk Factors and Clinical Characteristics of Neck Mass

A history of tobacco use was present in 23 (35.9%) patients and alcohol consumption in 18 (28.1%). Both tobacco and alcohol exposure were present in 16 (25.0%) patients.

On examination, cervical lymphadenopathy was the predominant type of neck mass. The masses were assessed for consistency, mobility, tenderness, fixation, and other clinically relevant characteristics.

Table 3. Risk Factors and Clinical Characteristics

Parameter	Number (n=64)	Percentage (%)
Risk factors		
Tobacco use	23	35.9
Alcohol consumption	18	28.1
Betel nut use	9	14.1
Dental/oral disease	12	18.8
No major risk factor	27	42.2
Clinical characteristics		
Cervical lymphadenopathy	45	70.3
Soft/firm mass	39	60.9
Hard mass	25	39.1
Tender mass	21	32.8

Fixed mass	15	23.4
Multiple lymph nodes	19	29.7

More than one risk factor or clinical characteristic could be present in an individual patient.

Anatomical Distribution of Neck Masses

Cervical lymphadenopathy was the most common anatomical presentation, occurring in 45 (70.3%) patients. Thyroid-region masses were seen in 7 (10.9%), parotid/submandibular masses in 6 (9.4%), and deep neck-space masses in 4 (6.3%) patients.

Table 4. Anatomical Distribution of Neck Masses

Site/type of neck mass	Number (n=64)	Percentage (%)
Cervical lymphadenopathy	45	70.3
Thyroid-region mass	7	10.9
Parotid/submandibular mass	6	9.4
Deep neck-space mass	4	6.3
Other neck masses	2	3.1
Total	64	100

Diagnostic Investigations

FNAC was the most frequently performed diagnostic investigation and was undertaken in 58 (90.6%) patients. Ultrasonography was performed in 51 (79.7%), while CECT neck was performed in 39 (60.9%) patients. Histopathological examination was required in 31 (48.4%) patients. Endoscopic evaluation was performed in patients in whom a mucosal primary or occult malignancy was suspected.

Table 5. Diagnostic Investigations Performed

Investigation	Number (n=64)	Percentage (%)
FNAC	58	90.6
Ultrasonography	51	79.7
CECT neck	39	60.9
MRI	8	12.5
Histopathological examination	31	48.4
Endoscopic evaluation	18	28.1
Direct laryngoscopy/panendoscopy with biopsy	11	17.2
Immunohistochemistry	7	10.9

FNAC and Histopathological Findings

FNAC provided a definitive or clinically useful diagnosis in the majority of patients who underwent the procedure. Inconclusive or inadequate cytology was observed in 9 (15.5%) of the 58 patients undergoing FNAC. Histopathological examination was subsequently performed in selected patients requiring definitive tissue diagnosis.

Table 6. FNAC Findings

FNAC finding	Number (n=58)	Percentage (%)
Reactive/inflammatory lesion	15	25.9
Granulomatous lesion	7	12.1
Benign neoplasm	10	17.2
Metastatic malignancy	18	31.0
Lymphoproliferative lesion	4	6.9
Inadequate/inconclusive	4	6.9
Total	58	100

Final Etiological Diagnosis

After correlation of all available clinical, radiological, cytological, endoscopic, and histopathological findings, malignant lesions constituted the largest diagnostic category, accounting for 25 (39.1%) patients. Inflammatory/infective lesions were diagnosed in 16 (25.0%), benign lesions in 15 (23.4%), and lymphoproliferative disorders in 5 (7.8%) patients.

Table 7. Final Etiological Diagnosis

Final diagnosis	Number (n=64)	Percentage (%)
Malignant lesions	25	39.1
Inflammatory/infective lesions	16	25.0
Benign lesions	15	23.4
Lymphoproliferative disorders	5	7.8
Other pathological lesions	3	4.7
Total	64	100

Malignancy and Occult Primary

Among the 25 patients diagnosed with malignancy, 20 (80.0%) had metastatic cervical malignancy, while 5 (20.0%) had primary malignant lesions of the neck.

Among the 20 patients with metastatic cervical malignancy, the primary site was identified in 16 (80.0%), whereas in 4 (20.0%) patients, the primary tumour remained unidentified despite appropriate clinical, radiological, endoscopic, and pathological evaluation. Thus, occult primary malignancy accounted for 4 (6.3%) of the total study population.

Table 8. Malignant Lesions and Identification of Primary Site

Finding	Number	Percentage (%)
Total malignant cases	25	100
Primary neck malignancy	5	20.0
Metastatic cervical malignancy	20	80.0
Primary identified among metastatic cases	16	80.0*
Occult primary among metastatic cases	4	20.0*

Percentage calculated among the 20 metastatic malignancy cases.

Diagnostic Challenges

The principal diagnostic challenge was difficulty in identifying the primary site in patients presenting with metastatic cervical lymphadenopathy. Inadequate or inconclusive FNAC was another important challenge, followed by the need for repeat tissue sampling and discordance between clinical, radiological, and cytological findings.

Table 9. Diagnostic Challenges Encountered

Diagnostic challenge	Number (n=64)	Percentage (%)
Difficulty identifying primary site	10	15.6
Inadequate/inconclusive FNAC	9	14.1
Requirement for repeat tissue sampling	8	12.5
Clinical-radiological/cytological discordance	7	10.9
Nonspecific clinical presentation	6	9.4
Occult primary malignancy	4	6.3

More than one diagnostic challenge could be present in an individual patient.

Management and Treatment Outcomes

Management was individualised according to the final diagnosis and disease extent. Surgical treatment was the most common modality, used in 20 (31.3%) patients, followed by medical treatment in 18 (28.1%).

At the end of the study period, 36 (56.3%) patients showed complete or significant clinical improvement. Persistent disease was observed in 10 (15.6%) patients, while 12 (18.8%) required further treatment or oncological referral.

Table 10. Management Modalities and Treatment Outcomes

Parameter	Number (n=64)	Percentage (%)
Management modality		
Medical treatment	18	28.1
Surgical treatment	20	31.3
Surgery with adjuvant therapy	9	14.1

Chemotherapy/radiotherapy-based treatment	8	12.5
Conservative/observation	5	7.8
Referral for further oncological management	4	6.3
Treatment outcome		
Complete/significant clinical improvement	36	56.3
Persistent disease	10	15.6
Further treatment/referral required	12	18.8
Lost to follow-up	6	9.4

DISCUSSION

The present prospective observational study evaluated 64 adult patients presenting with neck masses over six months at the Department of Otorhinolaryngology, Kodagu Institute of Medical Sciences, Madikeri. The study demonstrated the heterogeneous nature of adult neck masses and highlighted the diagnostic importance of cervical lymphadenopathy as a potential presentation of malignancy, including metastatic disease with an occult primary.

In the present study, males constituted 60.9% of the study population and females 39.1%, giving a male-to-female ratio of 1.56:1. The mean age was 48.2 ± 15.1 years, with the largest proportion of patients belonging to the 41–50-year age group. This age distribution is clinically relevant because persistent neck masses in middle-aged and older adults warrant careful evaluation for neoplastic disease. Previous clinical guidance similarly emphasises increased concern for malignancy in adults, particularly when suspicious physical findings are present.[1,8]

Painless neck swelling was the most frequent presenting symptom in the present study, occurring in 75.0% of patients. Pain, fever and weight loss were less frequent, while dysphagia, odynophagia and change in voice were observed in a smaller proportion. The predominance of painless swelling is important because an apparently asymptomatic or painless neck mass should not be assumed to be benign. Adult head and neck malignancies, particularly metastatic cervical nodal disease, may initially present as a painless swelling without prominent mucosal symptoms.[1]

Tobacco exposure was documented in 35.9% of patients and alcohol consumption in 28.1%, while 25.0% had both exposures. These findings are clinically important because tobacco and alcohol exposure are established risk factors for several head and neck malignancies. However, the present study also identified a substantial proportion of patients without major documented risk factors. Therefore, absence of a conventional risk factor should not exclude malignancy in an adult presenting with a persistent or suspicious neck mass. Contemporary evaluation guidelines emphasize the clinical characteristics of the mass and associated findings rather than relying solely on traditional risk factors.[1,2]

Cervical lymphadenopathy was the predominant anatomical presentation in the current study, accounting for 70.3% of all cases. This finding is particularly significant because cervical lymph nodes may be involved by inflammatory disease, lymphoma, primary regional malignancy or metastatic carcinoma. The clinical examination of nodal characteristics is therefore an essential component of the initial evaluation. In the present study, 39.1% of masses were described as hard, 23.4% were fixed, and 29.7% involved multiple lymph nodes. Such characteristics increase clinical suspicion for malignant disease and support the need for timely cytological and radiological evaluation.[1]

FNAC was the most frequently performed diagnostic investigation in the present series, being undertaken in 90.6% of patients. This is consistent with the recommended diagnostic approach to an adult neck mass in whom malignancy is suspected. FNAC offers a minimally invasive method of obtaining diagnostic material and is particularly useful for differentiating reactive lesions, granulomatous disease, metastatic carcinoma and other pathological processes.[1,4]

The FNAC findings in the present study showed metastatic malignancy as the largest cytological category, accounting for 31.0% of FNAC examinations, followed by reactive/inflammatory lesions and benign neoplasms. Lymphoproliferative lesions were identified in 6.9%. The predominance of metastatic disease among abnormal cytological diagnoses is consistent with the important role of cervical lymph nodes as a site of secondary involvement from head and neck malignancies.

An important diagnostic issue in the present study was inconclusive or inadequate FNAC. The results section reports 9 patients (15.5%) as having inadequate or inconclusive cytology,

whereas Table 6 currently lists 4 patients (6.9%) in this category. This discrepancy should be corrected before final submission. If 4 patients are retained, the text and the diagnostic-challenge section should be revised accordingly; if 9 patients are the intended number, Table 6 should be corrected, and its other category counts should be rechecked because the currently listed FNAC categories already sum to 58. This correction is necessary for numerical consistency and should not be overlooked.

Histopathological examination was required in 48.4% of the study population. This reflects the fact that FNAC, although highly useful as an initial investigation, may not provide sufficient information in every patient. Histopathological assessment becomes particularly important when cytology is inconclusive, when lymphoma or another lymphoproliferative disorder is suspected, when there is discordance between clinical and cytological findings, or when definitive tissue characterization is required.[1,4]

The final etiological analysis showed that malignant lesions constituted the largest diagnostic category, accounting for 39.1% of the total study population. Inflammatory/infective lesions accounted for 25.0%, benign lesions for 23.4%, lymphoproliferative disorders for 7.8% and other pathological lesions for 4.7%. The relatively high proportion of malignancy in this clinically selected adult ENT population emphasizes the importance of maintaining a high index of suspicion for malignant disease when evaluating persistent or unexplained neck masses.

Among the 25 patients with malignancy, 20 (80.0%) had metastatic cervical malignancy and 5 (20.0%) had primary malignant lesions of the neck. Among the metastatic cases, the primary tumour was identified in 16 patients, while 4 patients remained without an identifiable primary despite the evaluation performed. Thus, occult primary malignancy constituted 6.3% of the overall study population and 20.0% of metastatic malignancy cases in this series.

The occurrence of occult primary disease in the present study is clinically important. Published literature describes cervical metastatic squamous cell carcinoma from an unknown primary as an established but challenging clinical entity. In an Indian series from Tata Memorial Hospital, Mistry et al. reported that some patients with cervical nodal metastases from an initially unknown primary subsequently developed an identifiable primary during follow-up, highlighting the need for continued surveillance.[6] Another Indian study described metastatic carcinoma with an unknown primary as an uncommon but important presentation requiring systematic evaluation.[9] The 6.3% proportion observed in the present study should, however, be interpreted in relation to the relatively small sample size, six-month study duration and single-centre design.

Identification of the primary site remains one of the major diagnostic challenges in patients with metastatic cervical disease. In the present study, difficulty identifying the primary site was documented in 15.6% of patients, while four patients ultimately fulfilled the study definition of occult primary malignancy. Other challenges included inadequate or inconclusive FNAC, requirement for repeat tissue sampling, clinical-radiological/cytological discordance and nonspecific clinical presentation. These findings illustrate that diagnosis of a neck mass is often a sequential process rather than the result of a single investigation.

The diagnostic approach used in the present study, involving clinical examination, FNAC, imaging, endoscopy and tissue diagnosis when indicated, is consistent with established recommendations. The adult neck-mass guideline emphasizes targeted examination of the upper aerodigestive tract and recommends FNA rather than an initial open biopsy in patients at increased risk of malignancy.[1] For patients in whom FNA and imaging do not establish a diagnosis or primary site, examination of the upper aerodigestive tract under anesthesia with directed biopsies is recommended before proceeding to an open biopsy.[1]

For patients with confirmed cervical metastatic squamous cell carcinoma and an unknown primary, the diagnostic pathway may extend beyond conventional CT/MRI and endoscopy. Cianchetti et al. demonstrated that a systematic combination of nodal biopsy, CT/MRI and panendoscopy can identify occult primaries in a substantial proportion of patients, with the tonsillar region and base of tongue representing important sites.[3] More recent evidence indicates that FDG-PET/CT has a high sensitivity for occult primary detection and can complement conventional imaging and endoscopic evaluation.[5,10]

The present study did not include PET/CT as a routine investigation, and therefore its occult-primary detection rate should not be directly compared with studies using a more extensive

modern diagnostic pathway. Similarly, HPV/p16 testing was not reported in the current dataset. This is relevant because HPV-associated oropharyngeal carcinomas may present predominantly with cervical nodal metastasis and a clinically subtle primary tumour. Contemporary reviews recommend consideration of HPV status and immunohistochemistry in appropriate cervical metastatic squamous cell carcinomas because these investigations may provide clues regarding the likely site of origin and influence subsequent management.[10]

Management in the present study was individualised according to the final diagnosis and clinical circumstances. Surgical treatment was the most frequently recorded modality, followed by medical treatment, surgery with adjuvant therapy and chemoradiotherapy-based treatment. This broad treatment distribution reflects the heterogeneous etiological spectrum of adult neck masses rather than a single disease entity. In patients with malignant disease, treatment selection depends on tumour site, histological characteristics, nodal disease, resectability and overall clinical status.

Patients with occult primary malignancy present a particular therapeutic challenge because treatment must address established cervical metastatic disease while accounting for the possibility of an undetected mucosal primary. Published guidelines support multidisciplinary management, with surgery, radiotherapy and/or concurrent chemoradiotherapy selected according to nodal stage, histology and clinical circumstances.[5,10] Indian experience has also demonstrated that patients with cervical nodal metastasis from an unknown primary can achieve meaningful long-term outcomes when treated with curative intent.[6]

At the end of the study period, 56.3% of patients demonstrated complete or significant clinical improvement. Persistent disease was documented in 15.6%, while 18.8% required further treatment or oncological referral. Six patients (9.4%) were lost to follow-up. These outcomes should be interpreted as short-term clinical outcomes, because the study duration was only six months and the available follow-up was insufficient to determine long-term recurrence, disease-free survival or overall survival. In particular, the outcome category "complete/significant clinical improvement" should not be interpreted as equivalent to oncological cure.

Overall, the findings of the present study demonstrate that adult neck masses represent a clinically heterogeneous group in which malignancy constitutes a substantial proportion of diagnoses. Cervical lymphadenopathy was the predominant presentation, and metastatic malignancy accounted for most malignant cases. The presence of occult primary disease in a subset of patients reinforces the need for systematic evaluation of the upper aerodigestive tract and appropriate use of cytological, radiological, endoscopic and histopathological investigations.

The principal strength of the present study is its prospective assessment of the complete diagnostic pathway from clinical presentation to final diagnosis and short-term outcome. However, the relatively small sample size, single-centre setting, short study duration, absence of routine PET/CT and limited follow-up are important limitations. Further larger, multicentric studies with longer follow-up and incorporation of PET/CT and HPV/p16 assessment in appropriate cases would provide more comprehensive information regarding occult head and neck malignancies.

CONCLUSION

An adult neck mass should be approached as a potentially significant clinical finding rather than as a benign condition until an appropriate diagnosis has been established. Early clinical risk stratification, FNAC, appropriate cross-sectional imaging and targeted endoscopic/tissue evaluation can facilitate timely diagnosis. Particular attention should be given to patients with cervical metastatic disease in whom the primary site is not immediately apparent, as systematic evaluation and multidisciplinary management are essential for optimising clinical outcomes.

REFERENCES

1. Pynnonen MA, Gillespie MB, Roman B, Rosenfeld RM, Tunkel DE, Bontempo L, et al. Clinical Practice Guideline: Evaluation of the Neck Mass in Adults. Otolaryngol Head Neck Surg. 2017;157(2 Suppl).
2. Pynnonen MA, Colandrea M, Finestone SA, O'Connor SS. Clinical Practice Guideline: Evaluation of the Neck Mass in Adults—Executive Summary. Otolaryngol Head Neck Surg. 2017;157(2 Suppl).
3. Cianchetti M, Mancuso AA, Amdur RJ, Werning JW, Kirwan J, Morris CG, et al. Diagnostic evaluation of squamous cell

carcinoma metastatic to cervical lymph nodes from an unknown head and neck primary site. Laryngoscope. 2009;119(12):2348-2354.
4. Goyal N, et al. Evaluation of neck masses in adults. Am Fam Physician. 2015;91(10):698-706.
5. Paleri V, et al. Investigation and management of the unknown primary with metastatic neck disease: United Kingdom National Multidisciplinary Guidelines. J Laryngol Otol. 2016;130(S2).
6. Mistry RC, Qureshi SS, Talole SD, Deshmukh S. Cervical lymph node metastases of squamous cell carcinoma from an unknown primary: outcomes and patterns of failure. Indian J Cancer. 2008;45(2):54-58.
7. Shukla P, Gupta D, Bisht SS, Pant MC, Bhatt ML, Srivastava K, et al. Metastatic squamous cell carcinoma neck with occult primary: a retrospective analysis. Indian J Med Paediatr Oncol. 2009;30(4):124-130.
8. O'Mara W, Butler NN, Nemechek AJ. Carcinomas of unknown primary in the head and neck. J La State Med Soc. 2001;153(7):341-346.
9. Civantos FJ, Vermorken JB, Shah JP, Rinaldo A, Suárez C, Kowalski LP, et al. Metastatic squamous cell carcinoma to the cervical lymph nodes from an unknown primary cancer: management in the HPV era. Head Neck. 2021;43(2):548-561.
10. The radiological unknown primary of the head and neck: recommendations for imaging strategies based on a systematic review. Clin Otolaryngol. 2023.