International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614
ISSN (E): 2522-6622
Indexing: Embase
Impact Factor (RJIF): 6.71

www.gynaecologyjournal.com
2026; 10(1): 20-28
Received: 24-11-2025
Accepted: 27-12-2025

K Usharani
Associate Professor, Department of Radiology, Mamata Medical College, Khammam, Telangana, India

T Srinivas
Professor, Department of ENT, Mamata Medical College, Khammam, Telangana, India

Corresponding Author:
K Usharani
Associate Professor, Department of Radiology, Mamata Medical College, Khammam, Telangana, India

Radiological assessment of gynecologic malignancies with cervical and upper airway extension

K Usharani and T Srinivas

DOI: https://www.doi.org/10.33545/gynae.2026.v10.i1a.1851

Abstract
Background: Gynecologic malignancies are primarily staged by pelvic disease; however, advanced cases may demonstrate extrapelvic spread to cervical and supraclavicular lymph nodes and, less commonly, the upper aerodigestive tract. Such involvement signifies advanced disease, alters staging and treatment, and may cause airway morbidity. Cross-sectional imaging is essential for detection and characterization. Aim of the study was to evaluate the role of computed tomography (CT) and magnetic resonance imaging (MRI) in assessing cervical lymph node and upper airway involvement in gynecologic malignancies and to correlate imaging findings with clinical, ENT, and histopathological outcomes.
Materials and Methods: This prospective observational study included 100 patients with histopathologically confirmed gynecologic malignancies. All underwent contrast-enhanced CT and/or MRI for staging or restaging. Imaging evaluation focused on cervical/supraclavicular lymph nodes and upper airway involvement. ENT assessment and image-guided FNAC or biopsy were performed when indicated. Statistical analysis used chi-square or Fisher's exact test, with $p < 0.05$ considered significant.
Results: The mean age was 52.6 ± 10.8 years; carcinoma cervix was the most common malignancy. Cervical and supraclavicular lymphadenopathy were detected in 44% and 29% of patients, respectively, while upper airway involvement was seen in 24%. Imaging features such as central nodal necrosis, loss of fatty hilum, and extranodal extension showed significant correlation with metastatic disease ($p < 0.05$). CT and MRI demonstrated high diagnostic accuracy compared with histopathology.
Conclusion: CT and MRI reliably assess cervical nodal and upper airway involvement in gynecologic malignancies. A structured imaging approach with multidisciplinary correlation improves staging accuracy and supports optimal clinical management.

Keywords: Gynecologic malignancy, computed tomography, magnetic resonance imaging, cervical lymph nodes, upper airway involvement

Introduction
Gynecologic malignancies, including cancers of the cervix, endometrium, ovary, vagina, and vulva, constitute a major global health burden and account for significant cancer-related morbidity and mortality among women worldwide. These malignancies are traditionally staged and managed based on the extent of disease within the pelvis and abdomen. However, a subset of patients presents with extrapelvic spread, most commonly involving para-aortic, cervical, and supraclavicular lymph nodes, and rarely extending to the upper aerodigestive tract, including the larynx and trachea [1]. The presence of cervical or supraclavicular lymph node metastasis reflects advanced disease biology, is associated with poor prognosis, and often results in a change in therapeutic intent from curative to systemic or palliative management [2]. As clinical examination has limited sensitivity for detecting deep nodal disease and extrapelvic extension, radiological imaging has assumed a central role in accurate staging, prognostication, and treatment planning in these patients [3].
Magnetic resonance imaging (MRI) is the modality of choice for local pelvic evaluation, particularly in carcinoma of the cervix, owing to its excellent soft-tissue contrast and multiplanar capability. MRI enables precise assessment of tumor size, stromal and parametrial invasion, pelvic sidewall involvement, and extension to adjacent organs, all of which are critical determinants of stage and management [4]. Computed tomography (CT), while inferior to MRI for local tumor delineation, provides comprehensive evaluation of nodal disease and distant metastases, including cervical and supraclavicular lymphadenopathy, and remains widely used due to its availability and rapid acquisition. The revised 2018 FIGO staging system formally incorporated imaging findings into staging criteria, particularly for nodal involvement beyond

the pelvis, acknowledging the indispensable role of cross-sectional imaging in modern gynecologic oncology practice [5].

Upper airway involvement from gynecologic malignancies is rare but clinically significant because it may lead to hoarseness, dysphagia, stridor, airway compromise, or hemoptysis, sometimes necessitating urgent intervention. Proposed mechanisms include hematogenous dissemination, lymphatic spread, or contiguous extension in recurrent or disseminated disease [6]. The existing literature on laryngeal or tracheal metastases from gynecologic primaries is limited largely to isolated case reports and small case series. These reports describe imaging findings such as focal or diffuse soft-tissue thickening, airway narrowing, cartilage invasion, and associated cervical lymphadenopathy, which may closely mimic primary head-and-neck malignancies, thereby posing diagnostic challenges [7, 8].

Despite advances in imaging technology and evolving staging systems, there remains a significant gap in the standardized radiologic evaluation of gynecologic malignancies with cervical lymph node and upper airway involvement. Most published data on upper aerodigestive tract metastases are anecdotal, and there is limited prospective evidence defining optimal CT and MRI criteria for detection, characterization, and differentiation from benign or synchronous primary head-and-neck lesions [9]. Furthermore, systematic correlation of radiological findings with ENT evaluation and histopathological confirmation is lacking in the existing literature. These limitations highlight the need for structured studies focusing on CT- and MRI-based assessment of cervical nodal and upper airway extension in gynecologic malignancies.

The aim of this study is to systematically evaluate the radiological features of gynecologic malignancies with cervical (neck and supraclavicular) lymph node and upper airway involvement using computed tomography and magnetic resonance imaging, and to correlate these findings with clinical presentation, ENT evaluation, and histopathological results, with the objective of improving staging accuracy, early detection of airway involvement, and multidisciplinary management.

Materials and Methods

Study Design and Setting

This was a prospective, observational study conducted in the Department of Radiology at a Mamata Medical College in collaboration with the Departments of Obstetrics and Gynecology and Otorhinolaryngology (ENT) to ensure comprehensive clinical, radiological, and pathological correlation. Institutional Ethics Committee approval was obtained prior to commencement of the study, and written informed consent was obtained from all participants.

Study Population and Sample Size

The study included a total of 100 patients with histopathologically confirmed gynecologic malignancies who were referred to the Department of Radiology for imaging evaluation. Patients were recruited consecutively from the Obstetrics and Gynecology outpatient and inpatient services. The sample size was determined based on feasibility and expected patient load during the study period, with the objective of evaluating imaging features of cervical (neck) lymph node involvement and upper airway extension using CT and MRI.

Inclusion Criteria

- Female patients aged ≥18 years
- Histopathologically proven gynecologic malignancy, including:

a) Carcinoma cervix
b) Endometrial carcinoma
c) Ovarian carcinoma
d) Vaginal carcinoma
e) Vulvar carcinoma

- Patients referred for staging or restaging imaging
- Clinical or imaging suspicion of:

a) Cervical (neck or supraclavicular) lymph node involvement, and/or
b) Upper airway involvement

- Patients willing to provide informed consent

Exclusion Criteria

- Patients with known primary head-and-neck malignancy
- Patients with prior head-and-neck surgery or radiotherapy unrelated to gynecologic malignancy
- Pregnant patients
- Patients with contraindications to MRI (e.g., pacemakers, cochlear implants, ferromagnetic implants)
- Patients with contraindications to intravenous contrast administration
- Poor-quality or incomplete imaging studies

Gynecologic Clinical Parameters Assessed

The following gynecologic parameters were recorded for all patients:

- Type of gynecologic malignancy
- FIGO stage at presentation
- Tumor histopathology and grade
- Primary tumor size and laterality
- Presence of pelvic pain, abnormal uterine bleeding, or abdominal distension
- Prior treatment history (surgery, chemotherapy, radiotherapy, or combination)
- Clinical suspicion of recurrence or progression

ENT Clinical Parameters Assessed

ENT evaluation was performed in patients with suspected cervical nodal or upper airway involvement. The following parameters were assessed:

- Presence of neck swelling or palpable cervical lymph nodes
- Voice change or hoarseness
- Dysphagia or odynophagia
- Stridor or respiratory distress
- Hemoptysis
- Findings on indirect or flexible laryngoscopy
- Requirement for airway intervention (if any)

Imaging Protocol and Technique

Computed Tomography (CT)

Contrast-enhanced CT (CECT) of the neck, chest, abdomen, and pelvis was performed using a multidetector CT scanner following intravenous administration of iodinated contrast. Imaging parameters were standardized across patients. The neck region was carefully evaluated for cervical and supraclavicular lymph nodes, while the larynx, hypopharynx, and upper trachea were assessed for soft tissue lesions, airway narrowing, and cartilage involvement.

Magnetic Resonance Imaging (MRI)

MRI was performed using a 1.5T or 3T scanner. Pelvic MRI

included T1-weighted, T2-weighted, diffusion-weighted imaging (DWI), and contrast-enhanced sequences for detailed evaluation of the primary tumor and local extent. MRI of the neck was performed in selected cases to further characterize cervical lymph nodes and suspected upper airway lesions, particularly when CT findings were equivocal.

Radiological Parameters Assessed

The following imaging parameters were evaluated on CT and MRI:

Primary Tumor Assessment

- Site and size of the primary tumor
- Local extension to adjacent organs
- Parametrial or stromal invasion
- Pelvic sidewall involvement

Lymph Node Assessment

- Presence of cervical and supraclavicular lymph nodes
- Nodal size and short-axis diameter
- Morphology (shape, margins)
- Presence of central necrosis
- Loss of fatty hilum
- Conglomeration or extranodal extension

Upper Airway Assessment

- Soft tissue thickening of the larynx or hypopharynx
- Airway luminal narrowing
- Vocal cord involvement
- Cartilage invasion
- Extension to adjacent neck spaces

Image Interpretation and Correlation: All CT and MRI studies were independently reviewed by two experienced radiologists specializing in oncologic imaging. Radiologists were blinded to each other's interpretations. Discrepancies were resolved by consensus. Imaging findings were correlated with clinical findings from the Obstetrics and Gynecology and ENT departments, as well as with histopathological results from lymph node or airway biopsies wherever available.

Histopathological Evaluation: Fine-needle aspiration cytology or biopsy of cervical lymph nodes was performed under image guidance when indicated. Endoscopic biopsy of suspected upper airway lesions was carried out in collaboration with the ENT department. Histopathological examination was used as the reference standard for confirming metastatic involvement and excluding synchronous primary head-and-neck malignancies.

Statistical Analysis

Data were entered into a standardized data collection sheet and analyzed using appropriate statistical software. Descriptive statistics were used to summarize clinical and imaging findings. Associations between imaging features and histopathological results were analyzed using chi-square or Fisher's exact test as applicable. A p-value of less than 0.05 was considered statistically significant.

Results

Table 1: Demographic Characteristics of Study Population (n = 100)

Parameter	Value
Age (years), Mean ± SD	52.6 ± 10.8
Age range (years)	28 - 78
Age ≤ 40 years, n (%)	18 (18%)
Age 41-60 years, n (%)	56 (56%)
Age > 60 years, n (%)	26 (26%)
Gender (Female), n (%)	100 (100%)

The demographic profile of the study population is summarized in the table. The mean age of the patients was 52.6 ± 10.8 years, with an age range of 28 to 78 years, indicating that gynecologic malignancies in the present cohort predominantly affected middle-aged and older women. The majority of patients (56%) belonged to the 41-60-year age group, followed by those older than 60 years (26%), while a smaller proportion (18%) were aged 40 years or younger. All patients in the study were female, reflecting the exclusive occurrence of gynecologic malignancies in women.

Table 2: Distribution of Gynecologic Malignancies (n = 100)

Type of Malignancy	Number of Patients	Percentage (%)
Carcinoma cervix	48	48.0
Ovarian carcinoma	32	32.0
Endometrial carcinoma	14	14.0
Vaginal carcinoma	4	4.0
Vulvar carcinoma	2	2.0

Table 2 depicts the distribution of gynecologic malignancies in the study population. Carcinoma of the cervix was the most common malignancy, accounting for 48% of cases, followed by ovarian carcinoma in 32% of patients. Endometrial carcinoma constituted 14% of the study population, while vaginal and vulvar carcinomas were relatively uncommon, comprising 4% and 2% of cases, respectively. This distribution reflects the higher prevalence of cervical and ovarian cancers among patients presenting for advanced-stage imaging evaluation in a tertiary care setting.

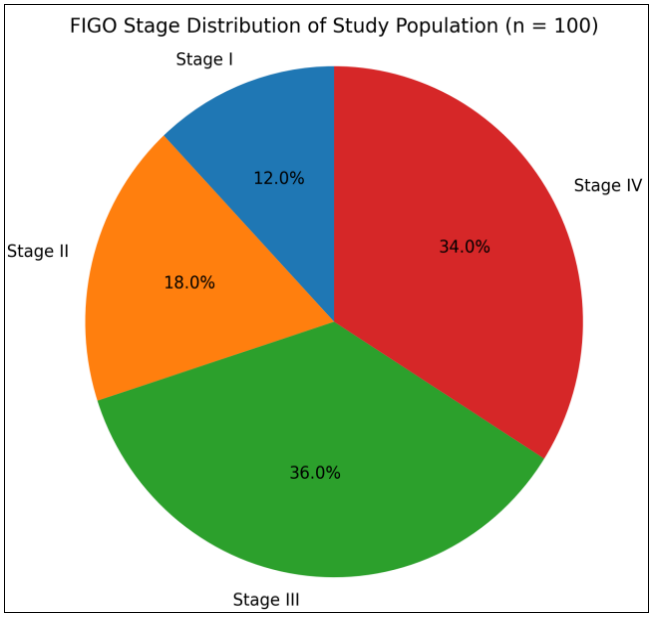

Fig 1: FIGO Stage Distribution of Study Population

Figure 1 shows the FIGO stage distribution of the study population. The majority of patients presented with advanced-stage disease, with Stage III and Stage IV accounting for 36% and 34% of cases, respectively. Early-stage disease was less common, with Stage I observed in 12% and Stage II in 18% of patients. This predominance of advanced stages is consistent with the study focus on cervical lymph node and upper airway involvement, which is more frequently encountered in advanced gynecologic malignancies.

Table 3: Histopathological Subtypes and Tumor Grade

Histopathology	**Number (%)**
Squamous cell carcinoma	46 (46.0)
Adenocarcinoma	32 (32.0)
Serous carcinoma	14 (14.0)
Clear cell carcinoma	5 (5.0)
Others	3 (3.0)
Tumor Grade	**Number (%)**
Grade I	18 (18.0)
Grade II	44 (44.0)
Grade III	38 (38.0)

Table 3 summarizes the histopathological subtypes and tumor grades observed in the study population. Squamous cell carcinoma was the most frequent histological subtype, accounting for 46% of cases, reflecting the predominance of carcinoma cervix in the cohort. Adenocarcinoma constituted 32% of cases, followed by serous carcinoma in 14%. Clear cell carcinoma and other rare histological variants together comprised a small proportion of patients.

With respect to tumor grading, the majority of tumors were of intermediate to high grade. Grade II tumors were most common (44%), followed by Grade III tumors (38%), while Grade I tumors accounted for 18% of cases. This distribution indicates that a substantial proportion of patients had biologically aggressive disease, correlating with the high prevalence of advanced FIGO stages and extrapelvic spread observed in the study.

Table 4: Primary Tumor Characteristics

Parameter	**Value**
Tumor size (cm), Mean ± SD	4.8 ± 1.9
Laterality (ovarian cancers only)	
- Unilateral	19 (59.4%)
- Bilateral	13 (40.6%)

Table 4 presents the primary tumor characteristics of the study population. The mean tumor size was 4.8 ± 1.9 cm, indicating that most patients had relatively large tumors at the time of imaging, consistent with advanced-stage disease. Among patients with ovarian carcinoma, unilateral ovarian involvement was more common, seen in 59.4% of cases, while bilateral involvement was observed in 40.6%. The presence of bilateral disease in a substantial proportion of ovarian cancers suggests more extensive tumor spread and has important implications for staging and treatment planning.

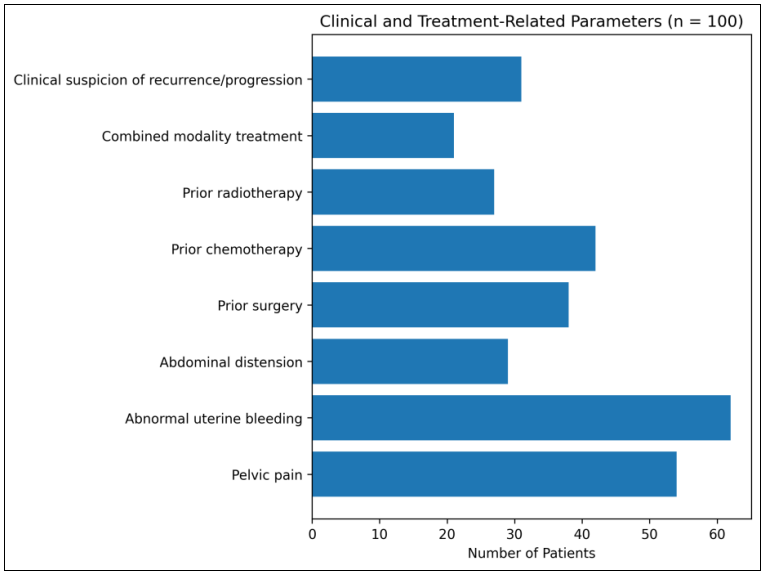

Fig 2: Clinical and Treatment-Related Parameters

Figure 2 outlines the clinical presentation and treatment-related characteristics of the study population. Abnormal uterine bleeding was the most common presenting symptom, observed in 62% of patients, followed by pelvic pain in 54%. Abdominal distension was reported in 29% of cases, reflecting the contribution of ovarian and advanced pelvic disease.

With regard to treatment history, 38% of patients had undergone prior surgical intervention, while 42% and 27% had received chemotherapy and radiotherapy, respectively. A combined modality approach had been used in 21% of patients. Clinical suspicion of recurrence or disease progression was present in 31% of cases, highlighting the role of imaging in restaging and assessment of treatment response in this subgroup.

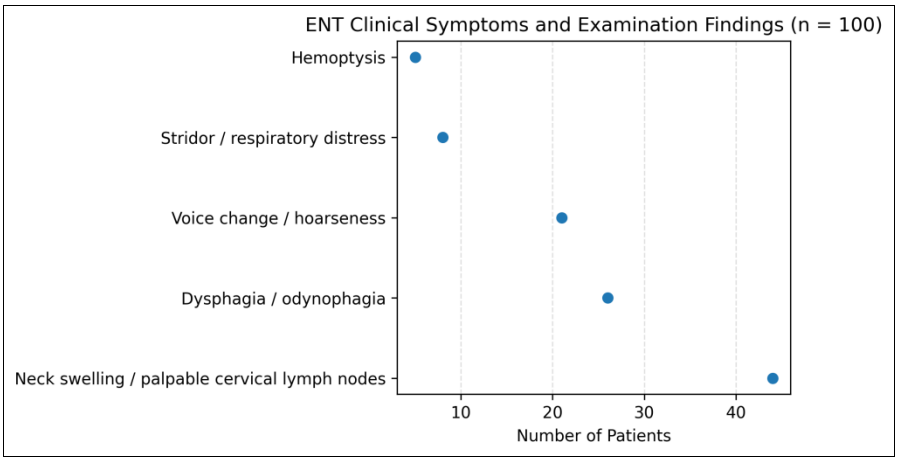

Fig 3: ENT Clinical Symptoms and Examination Findings (n = 100)

Figure 3 summarizes the ENT clinical symptoms and examination findings observed in the study population. Neck swelling or palpable cervical lymphadenopathy was the most frequent ENT finding, present in 44% of patients, corresponding with the high incidence of cervical nodal involvement on imaging. Upper airway-related symptoms were less common, with dysphagia or odynophagia reported in 26% and voice change or hoarseness in 21% of patients. More severe airway manifestations, such as stridor or respiratory distress, were observed in 8% of cases, while hemoptysis was an uncommon presentation, occurring in only 5% of patients.

Table 5: ENT Endoscopic Findings and Airway Management (n = 100)

Parameter	Number of Patients	Percentage (%)
Abnormal laryngoscopic findings	24	24.0
• Laryngeal mucosal lesion / mass	11	11.0
• Vocal cord fixation / paresis	7	7.0
• Supraglottic or hypopharyngeal narrowing	6	6.0
Normal laryngoscopy	76	76.0
Airway intervention required	9	9.0
• Emergency tracheostomy	4	4.0
• Elective tracheostomy	3	3.0
• Endoscopic debulking / biopsy	2	2.0

Table 5 depicts the findings of ENT endoscopic evaluation and the requirement for airway management in the study population. Abnormal laryngoscopic findings were observed in 24% of patients, most commonly in the form of laryngeal mucosal lesions or masses, followed by vocal cord fixation or paresis and supraglottic or hypopharyngeal narrowing. The majority of patients (76%) had normal laryngoscopic findings. Airway intervention was required in 9% of cases, reflecting clinically significant airway compromise. Emergency tracheostomy was performed in 4% of patients, while elective tracheostomy and endoscopic debulking or biopsy were required in 3% and 2% of cases, respectively, underscoring the importance of early detection and multidisciplinary management of upper airway involvement.

Table 6: Primary Tumor Assessment on CT and MRI (n = 100)

Radiological Parameter	Number of Patients	Percentage (%)
Primary tumor identified	100	100.0
Tumor site identifiable	100	100.0
Tumor size (cm), Mean ± SD	4.8 ± 1.9	—
Local extension to adjacent organs	41	41.0
Parametrial / stromal invasion	46	46.0
Pelvic sidewall involvement	28	28.0

Note: Tumor size was measured as the maximum dimension on MRI or CT, whichever best demonstrated tumor margins.

Table 6 summarizes the primary tumor characteristics as assessed on CT and MRI. The primary tumor and its site were successfully identified in all patients, highlighting the effectiveness of cross-sectional imaging in local tumor evaluation. The mean tumor size was 4.8 ± 1.9 cm, indicating that a majority of patients had relatively large lesions at presentation. Local extension to adjacent organs was observed in 41% of cases, while parametrial or stromal invasion was noted in 46%, reflecting a high proportion of locally advanced disease. Pelvic sidewall involvement was identified in 28% of patients, a finding that has important implications for staging, prognosis, and treatment planning.

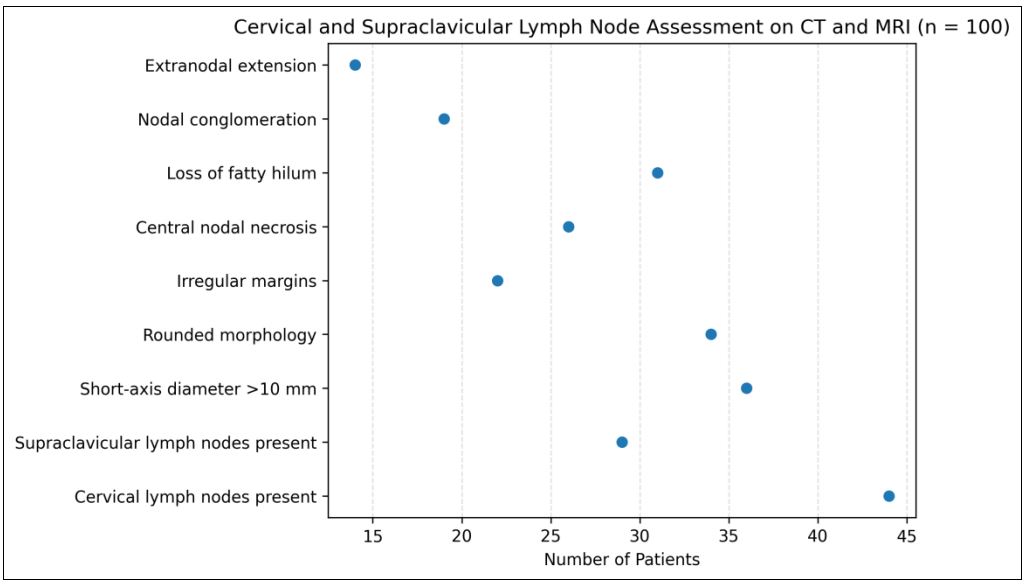

Fig 4: Cervical and Supraclavicular Lymph Node Assessment on CT and MRI (n = 100)

Figure 4 illustrates the cervical and supraclavicular lymph node findings on CT and MRI. Cervical lymphadenopathy was identified in 44% of patients, while supraclavicular lymph node involvement was noted in 29%, emphasizing the frequency of supradiaphragmatic nodal spread in advanced gynecologic malignancies. Enlarged lymph nodes with a short-axis diameter greater than 10 mm were observed in 36% of cases.

Malignant nodal morphological features were commonly encountered, including rounded morphology in 34%, loss of fatty hilum in 31%, and central nodal necrosis in 26% of patients. Irregular margins, nodal conglomeration, and extranodal extension were seen in 22%, 19%, and 14% of cases, respectively. These imaging features are suggestive of metastatic nodal involvement and highlight the importance of detailed morphologic assessment beyond size criteria alone when evaluating cervical and supraclavicular lymph nodes on CT and MRI.

Table 7: Upper Airway Involvement on CT and MRI (n = 100)

Upper Airway Imaging Parameter	Number of Patients	Percentage (%)
Soft tissue thickening of larynx / hypopharynx	24	24.0
Airway luminal narrowing	17	17.0
Vocal cord involvement	12	12.0
Cartilage invasion	7	7.0
Extension to adjacent neck spaces	9	9.0

Table 7 summarizes the upper airway findings detected on CT and MRI. Soft tissue thickening involving the larynx or hypopharynx was the most common imaging manifestation, observed in 24% of patients, indicating possible metastatic or infiltrative disease. Airway luminal narrowing was noted in 17% of cases and was clinically relevant due to its potential association with respiratory compromise. Vocal cord involvement was identified in 12% of patients, while cartilage invasion and extension into adjacent neck spaces were seen in 7% and 9% of cases, respectively. These findings underscore the importance of careful upper airway evaluation on cross-sectional imaging in patients with advanced gynecologic malignancies, particularly in those presenting with airway-related symptoms.

Table 8: Histopathological Evaluation of Cervical Lymph Nodes (n = 100)

Parameter	Number of Patients	Percentage (%)
Cervical / supraclavicular lymph nodes sampled	38	38.0
FNAC performed	26	26.0
Core / excision biopsy performed	12	12.0
Histopathology positive for metastasis	29	29.0
Histopathology negative for metastasis	9	9.0
Inconclusive / inadequate sample	4	4.0

Table 8 presents the histopathological evaluation of cervical and supraclavicular lymph nodes in the study population. Image-guided sampling was performed in 38% of patients with suspected nodal involvement. Fine-needle aspiration cytology was the most commonly used technique, performed in 26% of cases, while core or excision biopsy was carried out in 12%. Histopathological examination confirmed metastatic involvement in 29% of patients, whereas 9% showed no evidence of metastasis. Inconclusive or inadequate samples were encountered in 4% of cases. These findings emphasize the role of histopathology as the reference standard for confirming metastatic nodal disease and validating radiological findings.

Table 9: Histopathological Evaluation of Upper Airway Lesions (n = 100)

Parameter	Number of Patients	Percentage (%)
Patients with suspected upper airway lesion on imaging	24	24.0
Endoscopic biopsy performed	18	18.0
Metastatic involvement confirmed	13	13.0
Benign / inflammatory pathology	3	3.0
Synchronous primary head-and-neck malignancy excluded	18	18.0
Biopsy deferred (clinical/radiologic follow-up)	6	6.0

Table 9 summarizes the histopathological evaluation of suspected upper airway lesions. Imaging suggested upper airway involvement in 24% of patients, of whom endoscopic biopsy was performed in 18%. Metastatic involvement was histopathologically confirmed in 13% of cases, while benign or inflammatory pathology was identified in 3%. In all biopsied cases, a synchronous primary head-and-neck malignancy was excluded. In 6% of patients, biopsy was deferred and these cases were managed with clinical and radiologic follow-up. These findings highlight the importance of histopathological confirmation in differentiating metastatic disease from benign conditions and ruling out primary upper airway malignancies in patients with gynecologic cancers.

Table 10: Association between cervical lymph node imaging findings and histopathology

Imaging Finding	Metastasis Present	Metastasis Absent	Total	p-value
Imaging positive	26	7	33	
Imaging negative	3	34	37	
Total sampled	29	41	70	< 0.001*

Table 10 demonstrates the association between cervical lymph node findings on imaging and histopathological results. Among patients with imaging-positive cervical lymph nodes, metastatic involvement was confirmed in 26 cases, while 7 cases were histopathologically negative. Conversely, among imaging-negative cases, metastasis was identified in only 3 patients, with 34 showing no metastatic involvement. The association between imaging findings and histopathology was statistically significant ($p < 0.001$), indicating a strong correlation between CT/MRI-detected cervical lymphadenopathy and histopathologically proven metastasis.

Table 11: Association between upper airway imaging findings and histopathology

Imaging Finding	Metastasis Present	Metastasis Absent	Total	p-value
Imaging positive	13	5	18	
Imaging negative	0	6	6	
Total biopsied	13	11	24	0.002*

Table 11 shows the association between upper airway imaging findings and histopathological results. Among patients with imaging-positive upper airway lesions, metastatic involvement was confirmed in 13 cases, while 5 cases were histopathologically negative. None of the imaging-negative cases demonstrated metastatic disease on biopsy, with 6 cases

showing no evidence of metastasis. The association between imaging findings and histopathology was statistically significant ($p = 0.002$), indicating a strong correlation between CT/MRI-detected upper airway abnormalities and histopathologically confirmed metastatic involvement. This highlights the diagnostic value of cross-sectional imaging in the evaluation of suspected upper airway extension in gynecologic malignancies.

Table 12: Association between nodal morphology and histopathology

Imaging Feature	Metastasis Present n (%)	Metastasis Absent n (%)	p-value
Central necrosis	21 (72.4%)	5 (17.2%)	< 0.001
Loss of fatty hilum	23 (79.3%)	8 (27.6%)	< 0.001
Extranodal extension	12 (41.4%)	2 (6.9%)	0.003

Table 12 illustrates the association between specific nodal morphological features on CT and MRI and histopathological confirmation of metastatic disease. Central nodal necrosis was present in 72.4% of nodes with confirmed metastasis, compared to only 17.2% of non-metastatic nodes, demonstrating a highly significant association ($p < 0.001$). Similarly, loss of the fatty hilum was observed in 79.3% of metastatic nodes versus 27.6% of non-metastatic nodes ($p < 0.001$). Extranodal extension was also significantly more frequent in metastatic nodes (41.4%) compared with non-metastatic nodes (6.9%) ($p = 0.003$). These findings indicate that nodal morphological characteristics, particularly central necrosis and loss of fatty hilum, are strong predictors of metastatic involvement and reinforce the importance of detailed morphologic assessment on CT and MRI beyond size criteria alone.

Discussion

The present prospective, radiology-led study evaluated CT and MRI findings in gynecologic malignancies with particular emphasis on cervical and supraclavicular nodal disease and upper airway involvement, supported by multidisciplinary collaboration with Obstetrics and Gynecology and ENT departments and histopathological correlation where feasible. The demographic profile of the cohort (mean age 52.6 ± 10.8 years) was comparable to that reported in previous gynecologic oncology imaging studies (1-3). All primary tumors were identified on cross-sectional imaging, with a mean tumor size of 4.8 ± 1.9 cm, and a high prevalence of locally advanced features such as parametrial or stromal invasion (46%), adjacent organ extension (41%), and pelvic sidewall involvement (28%), consistent with the predominance of FIGO stage III and IV disease.

MRI proved valuable for local pelvic tumor mapping, while CT effectively complemented MRI by delineating nodal and extrapelvic disease [10]. These findings align with existing literature and the revised 2018 FIGO staging system, which formally incorporated imaging for accurate staging, particularly for nodal involvement beyond the pelvis [11]. Cervical lymphadenopathy and supraclavicular lymph node involvement were identified in 44% and 29% of patients, respectively, highlighting the frequency of supradiaphragmatic nodal spread in advanced gynecologic malignancies. Qiu *et al*. reported similarly poor outcomes in patients with supraclavicular lymph node metastasis in cervical cancer, emphasizing its prognostic significance [12].

Importantly, nodal morphological features such as central necrosis, loss of fatty hilum, and extranodal extension demonstrated statistically significant associations with histopathologically proven metastasis. This supports prior imaging principles that emphasize morphologic criteria over size alone in predicting nodal malignancy, particularly in cervical and supraclavicular regions where reactive lymphadenopathy is common [13].

Upper airway involvement was identified in 24% of patients on imaging, with histopathological confirmation in selected cases. Although rare, laryngeal or hypopharyngeal metastases from gynecologic primaries have been described in isolated reports and are clinically significant due to the risk of airway compromise [15]. The imaging findings observed in the present study are consistent with those reported by Purcell *et al*. and Lee *et al*., who highlighted the importance of imaging and ENT correlation in differentiating metastatic lesions from primary head-and-neck malignancies [15, 16].

Conclusion

This CT- and MRI-based prospective study demonstrates that systematic radiological assessment of primary tumor characteristics, cervical and supraclavicular lymph nodes, and upper airway structures is essential in patients with advanced gynecologic malignancies. Morphological nodal features such as central necrosis, loss of fatty hilum, and extranodal extension show strong correlation with metastatic disease and should be routinely reported. Although uncommon, upper airway involvement is clinically critical, and early detection through imaging combined with prompt ENT evaluation and histopathological confirmation facilitates appropriate airway management and multidisciplinary care. A structured CT/MRI reporting approach enhances staging accuracy and strengthens clinico-radiologic-pathologic correlation in advanced gynecologic oncology.

Conflict of Interest

Not available.

Financial Support

Not available.

References

1. Saleh M, Virarkar M, Javadi S, Elsherif SB, de Castro Faria S, Bhosale P. Cervical cancer: 2018 revised International Federation of Gynecology and Obstetrics staging system and the role of imaging. Am J Roentgenol. 2020;214(5):1182-1195.
2. Kido A, Nakamoto Y. Implications of the new FIGO staging and the role of imaging in cervical cancer. Br J Radiol. 2021;94(1125):20201342.
3. Dhamija E, Gulati M, Manchanda S, Singhal S, Sharma D, Kumar S, *et al*. Imaging in carcinoma cervix and revised 2018 FIGO staging system: implications in radiology reporting. Indian J Radiol Imaging. 2021;31(3):623-634.
4. Zand KR, Reinhold C, Abe H, Maheshwari S, Mohamed A, Upegui D. Magnetic resonance imaging of the cervix. Cancer Imaging. 2007;7(1):69-69.
5. Bhatla N, Berek JS, Cuello Fredes M, Denny LA, Grenman S, Karunaratne K, *et al*. Revised FIGO staging for carcinoma of the cervix uteri. Int J Gynecol Obstet.

2019;145(1):129-135.
6. Saoud M, Patil M, Dhillon SS, Pokharel S, Picone A, Hennon M, *et al*. Rare airway tumors: an update on current diagnostic and management strategies. J Thorac Dis. 2016;8(8):1922-1922.
7. Oukessou Y, Chebaatha A, Berrada O, Abada RL, Rouadi S, Roubal M, *et al*. Primary carcinoma of the larynx in females: a case series. Ann Med Surg. 2022;78.
8. Avitia S, Hamilton JS, Osborne RF. Metastatic ovarian cancer in the head and neck. Ear Nose Throat J. 2008;87(6):318-318.
9. Suzuki T, Kawamura K, Li Q, Okamoto S, Tada Y, Tatsumi K, *et al*. Mesenchymal stem cells are efficiently transduced with adenoviruses bearing type 35-derived fibers and the transduced cells with the IL-28A gene produces cytotoxicity to lung carcinoma cells co-cultured. BMC Cancer. 2014;14(1):713.
10. Husband JE. CT/MRI of nodal metastases in pelvic cancer. Cancer Imaging. 2002;2(2):123-129.
11. Dhamija E, Gulati M, Manchanda S, Singhal S, Sharma D, Kumar S, *et al*. Imaging in carcinoma cervix and revised 2018 FIGO staging system: implications in radiology reporting. Indian J Radiol Imaging. 2021;31(3):623-634.
12. Qiu JT, Ho KC, Lai CH, Yen TC, Huang YT, Chao A, *et al*. Supraclavicular lymph node metastases in cervical cancer. Eur J Gynaecol Oncol. 2007;28(1):33-38.
13. Som PM. Detection of metastasis in cervical lymph nodes: CT and MR criteria and differential diagnosis. AJR Am J Roentgenol. 1992;158(5):961-969.
14. Masuoka S, Hiyama T, Kuno H, Sekiya K, Sakashita S, Kobayashi T. Imaging approach for cervical lymph node metastases from unknown primary tumor. Radiographics. 2023;43(3):e220071.
15. Purcell C, Al Afif A, Bullock M, Corsten M. Ovarian cancer metastasis to the larynx: a case report and review of the literature. Case Rep Surg. 2020;2020:1543129.
16. Lee YC, Fang TJ, Lin CT. Metastatic endometrial adenocarcinoma to the larynx: a case report and discussion of upper airway management. J Palliat Med. 2014;17(7):867-869.

How to Cite This Article
Usharani K, Srinivas T. Radiological assessment of gynecologic malignancies with cervical and upper airway extension. International Journal of Clinical Obstetrics and Gynaecology. 2026;10(1):20-28.