Journal of
Otorhinolaryngology, Hearing and Balance Medicine

MDPI

Technical Note

Comprehensive Diagnostic Approach to Head and Neck Masses

Raisa Chowdhury [1], Sena Turkdogan [2], Raihanah Alsayegh [3], Hamad Almhanedi [3], Dana Al Majid [3], Gabriella Le Blanc [3], George Gerardis [3] and Lamiae Himdi [3,*]

[1] Faculty of Medicine and Health Science, McGill University, Montreal, QC H3G 2M1, Canada
[2] Department of Otolaryngology Head & Neck Surgery, University of British Columbia, Victoria, BC V5Z 1M9, Canada
[3] Department of Otolaryngology Head & Neck Surgery, McGill University Health Centre, Montreal, QC H4A 3J1, Canada
* Correspondence: lamiae.himdi@mcgill.ca

Abstract: Head and neck masses are a significant diagnostic challenge and differential diagnoses range from inflammatory, infectious, and neoplastic conditions. Timely, accurate evaluation is essential for optimal patient outcomes. This review highlights a systematic approach to diagnosing head and neck masses through comprehensive history, physical examination, and a variety of diagnostic tools. Imaging modalities such as computed tomography (CT), magnetic resonance imaging (MRI), and ultrasound are integral in diagnosis. Fine-needle aspiration (FNA) biopsy is a minimally invasive option for a preliminary diagnosis. However, in cases where it may be inconclusive or when extensive tissue sampling is needed to confirm a diagnosis, open tissue biopsy is considered. Collaboration among a multidisciplinary team (surgeons, radiologists, and pathologists) is vital in developing an effective individualized treatment plan. Early detection and accurate diagnosis of head and neck masses are critical for achieving favorable clinical outcomes.

Keywords: head and neck masses; imaging modalities; fine-needle aspiration; multidisciplinary management; patient outcomes

Citation: Chowdhury, R.; Turkdogan, S.; Alsayegh, R.; Almhanedi, H.; Al Majid, D.; Le Blanc, G.; Gerardis, G.; Himdi, L. Comprehensive Diagnostic Approach to Head and Neck Masses. *J. Otorhinolaryngol. Hear. Balance Med.* **2024**, *5*, 17. https://doi.org/10.3390/ohbm5020017

Academic Editor: Jeroen C. Jansen

Received: 23 September 2024
Revised: 7 November 2024
Accepted: 14 November 2024
Published: 19 November 2024

1. Case Scenario

Mr. P, a 55-year-old man, presents to the clinic with a gradually enlarging swelling on the left side of his neck, which he first noticed a few weeks ago. He describes the mass as painless and primarily noticeable when he touches his neck or turns his head. He denies any difficulty swallowing, changes in voice, or discomfort while chewing. He also reports no recent illnesses, fevers, chills, night sweats, unintentional weight loss, or trauma to the neck. Mr. P's medical history is unremarkable, and he is not on any regular medications.

On examination, a firm, non-tender, well-defined mass is palpated in the left anterior cervical region, just below the angle of the mandible. The mass is non-fluctuant and not warm to the touch. There are no palpable lymph nodes in the surrounding area, and the overlying skin is intact, showing no signs of inflammation or discoloration.

Given the clinical presentation, differential diagnoses could include benign causes (e.g., benign salivary gland tumor) or malignant conditions (e.g., lymphadenopathy secondary to metastatic disease, lymphoma). A systematic approach is essential to determine the underlying cause, guiding subsequent management.

Mr. P's age (55 years) increases the likelihood of malignancy, particularly in cases of metastatic disease or lymphoma. Other risk factors like human papilloma virus (HPV) infection, smoking, and alcohol consumption cancers should be considered if present. Also, screening for head and neck malignancies is essential, particularly when there are risk factors or concerning features such as a hard or fixed mass.

The following stages in assessing Mr. P's neck tumor should adhere to a systematic clinical decision-making framework. First, a detailed history and examination should be

performed. The presence of a painless, slowly developing mass with no high-risk symptoms suggests a benign cause but malignancy needs to be ruled out first. Imaging studies can help characterize the structural assessment of the mass as well as guide FNA biopsy if the mass is small or difficult to palpate. Fine-needle aspiration is generally considered the best next step for a definitive diagnosis. It provides a minimally invasive means of assessing cytology, differentiating the benign lesion from a malignancy. It is important to note that if FNA is not feasible due to the mass being highly vascular or the presence of infection, core biopsy or excisional biopsy may be considered, with additional imaging if necessary. The American Academy of Otolaryngology guidelines emphasize early imaging and FNA in patients with persistent neck masses.

Given Mr. P's presentation of a painless, gradually enlarging neck mass without associated systemic symptoms, the next step in management should focus on determining the underlying cause to guide appropriate patient care.

Question: What is the most appropriate next step in management for this patient?

(A) Order a complete blood count (CBC) and comprehensive metabolic panel (CMP)
(B) Perform fine-needle aspiration (FNA) biopsy of the mass
(C) Refer the patient for imaging studies (e.g., ultrasound, CT scan)
(D) Start empiric antibiotic therapy
(E) Reassure the patient and schedule a follow-up appointment in six months

Answer

B. Perform fine-needle aspiration (FNA) biopsy of the mass. FNA is the preferred next step as it is minimally invasive and often sufficient for the initial evaluation of a painless neck mass. This procedure allows for the collection of tissue samples from the mass, which can then be examined microscopically to differentiate between benign and malignant lesions, guiding further management decisions. Imaging (Option C) can complement FNA by providing an anatomical extension of the lesion but does not provide a definite diagnosis. An empiric antibiotic therapy (Option D) is not indicated, as there are no signs of infection, and reassurance with delayed follow-up (Option E) would be inappropriate without further evaluation.

2. Initial Approach

2.1. Overview of Head and Neck Mass

Head and neck masses are abnormal growths or lumps found between the base of the skull and the collarbone. They can arise from various conditions, including inflammation, congenital abnormalities, benign growths, or malignancies. In adults, these masses should be considered potentially malignant until proven otherwise. The diagnostic sequence begins with a thorough history and physical examination. Significant advances in diagnosis (i.e., rapid FNA biopsy following initial imaging) have improved initial assessment accuracy. These steps are crucial to ensure early diagnosis, appropriate management, and timely intervention by a multidisciplinary team [1–4].

2.2. History Taking

A detailed history is essential when evaluating a patient with a head or neck lump. Clinicians should assess the onset and duration of the presenting mass, and associated symptoms such as pain, difficulty swallowing, voice changes, fever, night sweats, unintentional weight loss, or recent trauma. Additionally, inquire about the patient's past medical history, including previous surgeries, chronic conditions, and current medications. Lifestyle factors, such as smoking, alcohol use, and occupational exposures, should also be discussed. Understanding family history, particularly regarding head and neck cancers, is crucial. This comprehensive history helps in forming a differential diagnosis and determining the need for further evaluation [5]. High-risk history (pain, short duration, weight loss) may prompt an immediate FNA for early cytological assessment, while low-risk history (painless, chronic, trauma) may justify observation.

2.3. Physical Examination

Physical examination is a critical component in assessing head and neck masses. In adults, a cautious approach is to consider neck masses as malignant until proven otherwise. It aims to characterize mass features such as size, mobility, and consistency. Specific physical exam findings, such as fixation to surrounding tissues, firmness, size greater than 1.5 cm, or skin ulceration, may indicate a higher risk of cancer [1,4].

Neurological assessment is crucial in evaluating head and neck masses, helping to identify neurologic pathologies and refine differential diagnoses. This includes a thorough examination of the cranial nerves, which are vital for head and neck function. Imaging studies further assist in differentiating benign from malignant lesions, aiding in the development of treatment strategies [6] (Table 1).

Table 1. Physical examination of head and neck mass. Adapted from [6–9].

Examination Component	Details
Assessment of Mass Location and Size	Determine the exact location, size, and any changes over time.
Evaluation of Skin Color and Texture	Observe for discoloration, redness, or changes in skin texture over the mass.
Palpation for Tenderness or Firmness	Assess the mass for tenderness, firmness, and consistency.
Assessment of Mass Mobility	Evaluate whether the mass is mobile or fixed to surrounding tissues.
Examination of Surrounding Lymph Nodes	Check for enlargement or tenderness in regional lymph nodes.
Assessment of Cranial Nerve Function	Test the functionality of cranial nerves to detect any neurological deficits.
Evaluation of Voice Quality and Swallowing	Assess for hoarseness, voice changes, or difficulty swallowing.
Inspection of Oral Cavity and Oropharynx	Examine the mouth, throat, and oropharynx for any abnormalities.
Examination of Nasal Cavity and Sinuses	Check for obstructions, masses, or signs of infection in the nasal passages.
Assessment of Thyroid Gland (if applicable)	Evaluate for enlargement, nodules, or tenderness of the thyroid gland.
Inspection of Ear Canal and Tympanic Membrane	Examine the ear canal and eardrum for abnormalities or fluid.

2.4. Differential Diagnosis

Cervical masses are frequently encountered in adult patients by general practitioners. A thorough medical history and comprehensive physical examination are paramount. Considerations include patient age and characteristics of the mass, such as location, size, and duration. In young children, inflammatory and infectious causes like cervical adenitis and cat-scratch disease are common, whereas congenital anomalies like branchial cleft cysts and thyroglossal duct cysts should be considered. In older adults, the differential diagnosis is broader, where both benign and malignant neoplastic causes (lymphoma, squamous cell carcinoma, and metastatic tumors) are more prevalent [8]. In these cases, the mass's characteristics (such as being firm, fixed, or progressively enlarging) often raise suspicion for malignancy. Current guidelines suggest observation for low-risk masses (mobile, soft, small size), and a conservative approach (observation or antibiotic course) may be suitable. But in high-risk masses (fixed, firm, larger than 1.5 cm), a combination of FNA and imaging is suggested to confirm the diagnosis, allowing for early detection and timely treatment [1,4].

2.5. Investigations

Imaging studies are essential in evaluating head and neck masses, providing critical information about their nature and extent [10,11]. First-line investigations for all adults at risk of malignancy consist of CT of the neck with contrast and fine-needle aspiration. These two investigations provide complementary information, including primary tumor histopathological detection, anatomical localization, and nodal staging. Simultaneously arranging these investigations prevents delays in diagnosis and treatment [4].

2.5.1. Computed Tomography (CT) of Neck with Intravenous Contrast

It is the preferred initial imaging modality for staging head and neck masses. It effectively delineates bony invasion, evaluates nodal basins, and is the first-line choice for lesions in the oral, oropharyngeal, laryngeal, and hypopharyngeal regions [11–14]. Also, a CT scan can help differentiate benign processes, such as salivary calculi or dental infections.

While generally safe, CT scans may be contraindicated due to contrast use, in patients with kidney impairment or iodine allergy [1,7].

2.5.2. Fine-Needle Aspiration Biopsy

It is a vital diagnostic tool for non-thyroidal head and neck lesions. It provides clinicians with key insights into tissue composition and pathology, and determines the nature (benign or malignant) of the suspicious masses. FNA biopsy is valued for its accessibility, cost-effectiveness, and clinical utility [11,13]. The procedure involves the extraction of cellular material from suspicious masses, enabling cytological examination to determine the underlying pathology. When correlated with subsequent excisional biopsy results, FNA significantly enhances diagnostic accuracy and aids in treatment planning for patients with head and neck masses [15]. However, it is contraindicated in vascular lesions due to inadequate sampling because of risk of bleeding. Despite this, FNA and contrast-enhanced CT scanning are optimal for assessing these masses. Persistent neck masses beyond one course of broad-spectrum antibiotics over four to six weeks warrant referral to otolaryngology for endoscopic evaluation and possible excisional biopsy [6,8].

2.5.3. Other Investigations

Ultrasound imaging is the preferred initial modality for assessing thyroid, salivary gland, lymph node, muscle, and soft tissue pathologies within the head and neck region. It is also helpful in ultrasound guided-FNA in cases where the mass is very small or deep within the skin, which makes it difficult to palpate. Improved visualization through ultrasound allows for better sample collection [10,12].

Magnetic resonance imaging (MRI) is particularly useful for assessing soft tissue involvement and detecting small tumors [10,12]. MRI excels in detecting sinonasal, nasopharyngeal, and salivary gland tumors. However, it has some drawbacks which include more motion artifacts, longer scan times, and generally poorer availability and tolerability compared to CT. Therefore, CT remains the preferred primary imaging modality for head and neck pathologies [4].

Positron emission tomography (PET) with CT utilizing the fluorodeoxyglucose tracer has demonstrated high sensitivity and specificity in the detection of primary and recurring head and neck tumors. As a result, PET/CT is becoming increasingly important in the evaluation of head and neck tumors, particularly in the diagnosis of residual or recurrent tumors following treatment. However, due to its restricted availability, PET/CT is not suitable as a first-line imaging investigation [4,11–14].

Ultrasonography is invaluable for differentiating between cystic from solid lesions and evaluating lymph nodes in head and neck masses. They offer a detailed assessment of nodal size, distribution, internal structure, and vascular patterns. Doppler and contrast-enhanced ultrasonography provide additional insights into lymph node perfusion and differentiate high-flow from low-flow vascular malformations [9]. Ultrasonography can also help guide FNA for nonpalpable or tiny superficial lesions. Although CT and ultrasonography have equal capabilities, ultrasonography is frequently preferred initially in younger patient populations to limit radiation exposure [16].

Elastography allows for both qualitative and quantitative assessment of lymph node stiffness. Due to its reliability and cost-effectiveness, ultrasonography is an excellent screening method for detecting malignant lymph nodes, with higher sensitivity compared to other imaging modalities [9]. Laryngeal sonography has evolved as an important imaging method, particularly during the SARS-CoV-2 epidemic. It is quick, non-invasive, and allows for repeated real-time evaluation of the patient, which might be advantageous in some diagnostic settings. However, head and neck sonography is still operator-dependent, which affects diagnostic sensitivity and specificity [17]. The investigation of head and neck masses is based on excluding malignancy. The course of investigation is determined by an assessment of the indications and symptoms, as well as the results of prior investigations. An approach to investigation is shown in Figure 1.

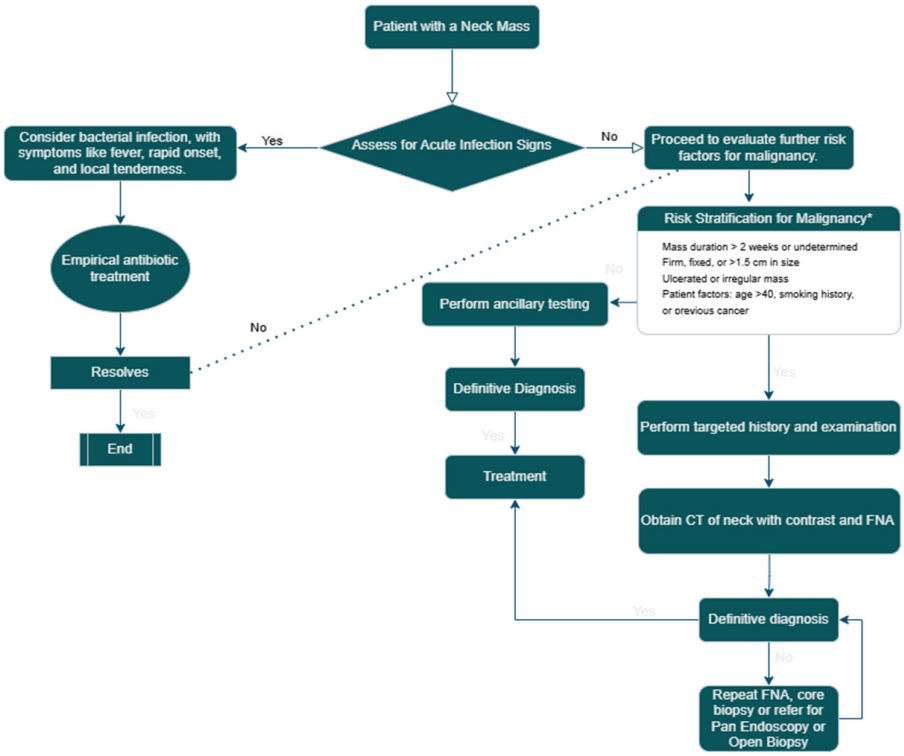

Figure 1. Flowchart for the assessment of adults with a head and neck mass. A diagram illustrating the sequence of clinical evaluation and diagnostic procedures. CT: computed tomography; FNA: fine-needle aspiration. Adapted from the American Academy of Otolaryngology [1].

3. Beyond the Initial Approach

3.1. Multidisciplinary Approach

A comprehensive, multidisciplinary approach (pathologists, surgeons, radiologists, and oncologists) is crucial for effectively managing patients with head and neck masses. Radiologists use imaging modalities to help in diagnosis and staging by determining the precise location of the tumor and surrounding anatomical structures. Pathologists make the final diagnosis by histological examination, remarking on the precise nature of the mass, and its spread to neighbouring structures. Surgeons play an important role in tumor removal using conservative or thorough excisional biopsies of the mass. Medical and radiation oncologists plan and administer chemotherapy and radiation therapy, especially in the treatment of malignant head and neck malignancies. This collaborative strategy ensures thorough assessment, accurate diagnosis, and improved treatment outcomes by adhering to established clinical protocols and fostering participation in research initiatives. Multidisciplinary teams are instrumental in shaping diagnostic and therapeutic strategies, particularly for patients newly diagnosed with head and neck malignancies [18–21].

3.2. Surgical Intervention

Surgical management remains a viable and effective option for treating head and neck masses. The size of the tumor, its location, and the patient's overall health determine surgical candidacy. Over recent decades, the development of minimally invasive, endoscopically-assisted transoral approaches (transoral robotic surgery and transoral laser microsurgery) has gained popularity due to their enhanced cosmetic and functional outcomes. These approaches allow for adequate mass excision with minimal external incisions, making it ideal for early-stage or benign tumors with limited vascular involvement [22]. However, minimally invasive techniques for emergent bleeding offer limited survival benefits. Larger invasive tumors or those involving vital structures often require traditional open surgery, which may be combined with reconstruction for optimal functional and

aesthetic outcomes [23,24]. Surgery is still the preferred treatment option due to complete removal and lower chances of recurrence [16].

3.3. Non-Surgical Treatment

Non-surgical treatments (radiotherapy and chemotherapy) are frequently recommended for patients who have contraindications to surgery, such as those with advanced disease, a high anesthesia risk, or those who value functional preservation. Patient factors such as age, comorbidities, and the presence of metastatic disease also influence surgical decisions, as older patients or those with advanced disease may derive more benefit from non-surgical therapies. Radiotherapy is particularly suited for patients with localized tumors where organ preservation is desired. Conversely, chemotherapy is typically indicated in advanced or metastatic cases, where it may help control disease progression and improve survival [16].

3.3.1. Radiation Therapy

Radiation therapy is a common treatment modality for head and neck masses, either as a standalone treatment or in combination with chemotherapy. Standard radiation doses for primary treatment typically range between 60 and 70 Gy, delivered using high-energy photons via external beam radiation. Given the complex anatomy of the head and neck, meticulous planning is required to minimize potential adverse effects. Innovative techniques such as intensity-modulated radiation therapy (IMRT) and magnetic resonance-guided high-intensity focused ultrasound (MRg-HIFU) are being explored to enhance treatment efficacy while reducing side effects [25,26].

3.3.2. Chemotherapy

Chemotherapy regimens for head and neck cancer often include platinum-based agents, antimetabolites like 5-fluorouracil (5-FU) and methotrexate, and taxanes. Targeted therapies, such as anti-EGFR antibodies, may also be incorporated into treatment protocols. Response rates to conventional treatments, such as 5-FU combined with cisplatin or carboplatin, generally range from 20 to 30%. Ongoing research is investigating the efficacy of newer agents, including artemisinin derivatives and sGC activators, in the management of head and neck malignancies [27,28] (Table 2).

Table 2. Management of head and neck mass. Adapted from [18,19,23–28].

Management Approaches	Description
Surgical Intervention	Surgical removal of the head or neck mass, often aiming for complete excision.
Radiation Therapy	High-energy radiation is used to target and destroy cancer cells.
Chemotherapy	Administration of drugs to kill or inhibit the growth of cancer cells.
Targeted Therapy	Focuses on specific molecules involved in cancer growth and progression.
Immunotherapy	Enhances the body's immune response to fight cancer more effectively.
Surveillance Monitoring	Provides symptom relief and improves the comfort and quality of life for patients.
Supportive Care	Provides symptom relief and improves the comfort and quality of life for patients.
Patient Education	Informs patients about their condition, treatment options, and care strategies.
Referral to Specialist	Directs patients to specialized healthcare professionals for advanced care.
Treatment Planning	Development of a personalized and comprehensive management plan tailored to the patient's needs.

3.4. Follow-Up

The necessity for a routine follow-up beyond three years post-treatment in head and neck cancer patients is debated, as only about 2% of recurrences are detected after this period, all of which are symptomatic. For patients, additional visits as symptoms arise may be sufficient for late-stage follow-up needs [29]. Recurrence rates are highest within the first three years following treatment, with regular visits recommended during this period, extending up to five years in some cases. Beyond this timeframe, the frequency of follow-ups should be tailored to the individual patient's needs, focusing on early de-

tection of recurrence, managing treatment-related complications, and providing ongoing psychosocial support [29].

4. Limitations

However, the limitation of this study is the variability in diagnostic imaging modalities that is used for better visualization and staging of the tumor. The choice of imaging modality, especially between CT with contrast and MRI with contrast, makes a difference in the information obtained in the tumor's structure and extent, that may eventually influence the staging outcome. While CT with contrast is useful for bony invasion, the extent of tumor into soft tissue is visualized better with contrast of MRI, which provides more accurate staging in specific cases. Thus, relying on a single imaging modality may limit the ability to stage cases consistently.

5. Conclusions

Overall, adapting a standardized approach that aligns with current national and international protocols is crucial. This will ensure better, early, and consistent diagnosis and management of head and neck masses. As imaging and diagnostic modalities evolve, the continued refinement of these protocols will enhance diagnostic accuracy and improve patient outcomes.

Author Contributions: Conceptualization, R.C.; methodology, R.C.; validation, R.C., S.T., R.A., H.A., D.A.M., G.L.B., G.G. and L.H.; formal analysis, R.C.; investigation, R.C. and L.H.; data curation, R.C.; writing—original draft preparation, R.C.; writing—review and editing, R.C., S.T., R.A., H.A., D.A.M., G.L.B., G.G. and L.H.; visualization, R.C.; supervision L.H.; project administration, R.C. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflicts of interest.

List of Abbreviations

Abbreviation	Full Term
5-FU	5-Fluorouracil
CBC	Complete Blood Count
CT	Computed Tomography
EGFR	Epidermal Growth Factor Receptor
FNA	Fine-Needle Aspiration
HPV	Human Papilloma Virus
IMRT	Intensity-Modulated Radiation Therapy
MRI	Magnetic Resonance Imaging
MRg-HIFU	Magnetic Resonance-Guided High-Intensity Focused Ultrasound
PET	Positron Emission Tomography
sGC	Soluble Guanylate Cyclase

References

1. Pynnonen, M.A.; Gillespie, M.B.; Roman, B.; Rosenfeld, R.M.; Tunkel, D.E.; Bontempo, L.; Brook, I.; Chick, D.A.; Colandrea, M.; Finestone, S.A.; et al. Clinical practice guideline: Evaluation of the neck mass in adults executive summary. *Otolaryngol. Head Neck Surg.* **2017**, *157*, 355–371. [CrossRef] [PubMed]
2. Woźniak, A.; Szyfter, K.; Szyfter, W.; Florek, E. Head and neck cancer—History. *Przegl. Lek.* **2012**, *69*, 1079–1083. [PubMed]
3. Heslop, G.; Oliver, C.L. Modern approach to the neck mass. *Surg. Clin. N. Am.* **2022**, *102*, e1–e6. [CrossRef] [PubMed]
4. Tan, E.; Jaya, J. An approach to neck masses in adults. *Aust. Fam. Physician* **2020**, *49*, 267–270. [CrossRef] [PubMed]
5. Getz, K.R.; Rozek, L.S.; Peterson, L.A.; Bellile, E.L.; Taylor, J.M.G.; Wolf, G.T.; Mondul, A.M. Family history of cancer and head and neck cancer survival. *Laryngoscope* **2017**, *127*, 1816–1820. [CrossRef] [PubMed]
6. Ozdas, T.; Ozcan, K.M.; Ozdogan, F.; Cetin, M.A.; Dere, H. The correlation between clinical prediagnosis and pathology results in the diagnosis of neck masses. *Indian J. Otolaryngol. Head Neck Surg.* **2014**, *66*, 237–240. [CrossRef]
7. Zajkowski, P.; Białek, E.J. Zastosowanie ultrasonografii w laryngologii—Krótka informacja. *Otolaryngol. Pol.* **2007**, *61*, 544–549. [CrossRef]

8. Schwetschenau, E.; Kelley, D.J. The adult neck mass. *Am. Fam. Physician* **2002**, *66*, 831–838. [PubMed]
9. Ying, M.; Bhatia, K.S.S.; Lee, Y.P.; Yuen, H.Y.; Ahuja, A.T. Review of ultrasonography of malignant neck nodes: Greyscale, Doppler, contrast enhancement and elastography. *Cancer Imaging* **2013**, *13*, 658–669. [CrossRef]
10. Touska, P.; Connor, S.E.J. Recent advances in MRI of the head and neck, skull base and cranial nerves: New and evolving sequences, analyses and clinical applications. *Br. J. Radiol.* **2019**, *92*, 20190513. [CrossRef]
11. Mukherjee, S.; Fischbein, N.J.; Baugnon, K.L.; Policeni, B.A.; Raghavan, P. Contemporary imaging and reporting strategies for head and neck cancer: MRI, FDG PET/MRI, NI-RADS, and carcinoma of unknown primary—AJR expert panel narrative review. *Am. J. Roentgenol.* **2023**, *220*, 160–172. [CrossRef] [PubMed]
12. Junn, J.C.; Soderlund, K.A.; Glastonbury, C.M. (Eds.) Imaging of head and neck cancer with CT, MRI, and US. In *Seminars in Nuclear Medicine*; WB Saunders: Philadelphia, PA, USA, 2021.
13. Düzgün, F.; Tarhan, S.; Ovalı, G.Y.; Eskiizmir, G.; Pabuşçu, Y. Is computed tomography perfusion a useful method for distinguishing between benign and malignant neck masses? *Ear Nose Throat J.* **2017**, *96*, E1–E5. [CrossRef] [PubMed]
14. Al-Ibraheem, A.; Abdlkadir, A.; Herrmann, K.; Bomanji, J.; Jadvar, H.; Shi, H.; Mansour, A.; Paez, D.; Chiti, A.; Scott, A.M. Diagnostic accuracy of [(18)F]FDG PET/MRI in head and neck squamous cell carcinoma: A systematic review and meta-analysis. *J. Nucl. Med.* **2024**, *65*, 1533–1539. [CrossRef] [PubMed]
15. Göret, C.C.; Göret, N.E.; Özdemir, Z.T.; Özkan, E.A.; Doğan, M.; Yanık, S.; Gümrükçü, G.; Aker, F.V. Diagnostic value of fine needle aspiration biopsy in non-thyroidal head and neck lesions: A retrospective study of 866 aspiration materials. *Int. J. Clin. Exp. Pathol.* **2015**, *8*, 8709.
16. Haynes, J.; Arnold, K.R.; Aguirre-Oskins, C.; Chandra, S. Evaluation of neck masses in adults. *Am. Fam. Physician* **2015**, *91*, 698–706.
17. Cergan, R.; Dumitru, M.; Vrinceanu, D.; Neagos, A.; Jeican, I.I.; Ciuluvica, R.C. Ultrasonography of the larynx: Novel use during the SARS-CoV-2 pandemic. *Exp. Ther. Med.* **2021**, *21*, 1. [CrossRef]
18. Shellenberger, T.D.; Weber, R.S. Multidisciplinary team planning for patients with head and neck cancer. *Oral Maxillofac. Surg. Clin. N. Am.* **2018**, *30*, 435–444. [CrossRef]
19. Beeram, M.; Kennedy, A.; Hales, N. (Eds.) Barriers to comprehensive multidisciplinary head and neck care in a community oncology practice. In *American Society of Clinical Oncology Educational Book*; American Society of Clinical Oncology: Alexandria, VA, USA, 2021.
20. Yokota, T.; Mukaigawa, T.; Yasunaga, Y.; Ogawa, H.; Onoe, T.; Yurikusa, T.; Yamashita, A. Multidisciplinary tumor board for head and neck cancer from the perspective of medical oncologists—Optimizing its effectiveness. *Front. Oncol.* **2023**, *13*, 1257853. [CrossRef]
21. Meltzer, C.; Nguyen, N.T.; Zhang, J.; Aguilar, J.; Blatchins, M.A.; Quesenberry, C.P., Jr.; Wang, Y.; Sakoda, L.C. Survival associated with consolidated multidisciplinary care in head and neck cancer: A retrospective cohort study. *Otolaryngol. Head Neck Surg.* **2023**, *168*, 82–90. [CrossRef]
22. Barrow Neurological Institute. Head and Neck Cancer Surgery. 2024. Available online: https://www.barrowneuro.org/treatment/head-and-neck-cancer-surgery/ (accessed on 1 July 2024).
23. Krol, E.; Brandt, C.T.; Blakeslee-Carter, J.; Ahanchi, S.S.; Dexter, D.J.; Karakla, D.; Panneton, J.M. Vascular interventions in head and neck cancer patients as a marker of poor survival. *J. Vasc. Surg.* **2019**, *69*, 181–189. [CrossRef]
24. Zhang, S.; Wang, L.; Li, S. Surgery for mass at root of the neck—With 26 cases report. *Lin Chuang Er Bi Yan Hou Tou Jing Wai Ke Za Zhi* **2011**, *25*, 529–530. [PubMed]
25. Semrau, R. The role of radiotherapy in the definitive and postoperative treatment of advanced head and neck cancer. *Oncol. Res. Treat.* **2017**, *40*, 347–352. [CrossRef] [PubMed]
26. Lee, J.; Farha, G.; Poon, I.; Karam, I.; Higgins, K.; Pichardo, S.; Hynynen, K.; Enepekides, D. Magnetic resonance-guided high-intensity focused ultrasound combined with radiotherapy for palliation of head and neck cancer—A pilot study. *J. Ther. Ultrasound* **2016**, *4*, 12. [CrossRef] [PubMed]
27. Pavillet, J.; Guigay, J.; Saint-Guily, J.L.; Righini, C.-A. Organization of primary care pathway in head and neck oncology (short version): Organization of chemotherapy in head and neck oncology. *Eur. Ann. Otorhinolaryngol. Head Neck Dis.* **2015**, *132*, 209–212. [CrossRef]
28. Hennemann, B. Palliative Chemotherapie von Kopf-Hals-Tumoren: Aktueller Stand und neue Entwicklungen. *Laryngo-Rhino-Otologie* **2006**, *85*, 172–178. [CrossRef]
29. Kytö, E.; Haapio, E.; Minn, H.; Irjala, H. Critical review of the follow-up protocol for head and neck cancer patients. *J. Laryngol. Otol.* **2019**, *133*, 424–429. [CrossRef]