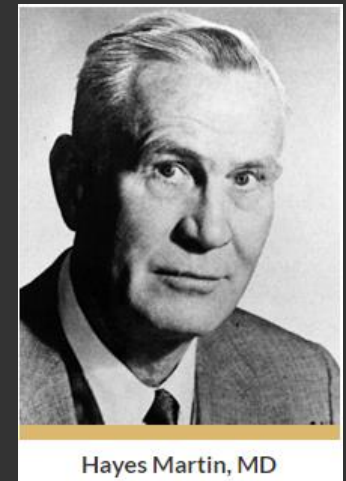


# Open biopsy: Is there still a role?

Jennifer Bruening, MD

Best Evidence ENT, July 31, 2022

# history



- Open neck mass biopsy standard of care
- 1830s- needle aspiration
- 1870-1880- tissue stains
- 1927- Dudgeon and Patrick used needle aspiration of tumors for rapid microscopic diagnosis
  - 200 cases; Diagnostic accuracy of 98.6%
- 1933, (Steward, Ewing, Ellis, Hayes Martin) reported analyzed by needle aspiration and H&E stain
- Cytologist vs clinician and doubt
- 1942- Papanicolaou developed the PAP smear
- 1974- Swedish developed precise diagnostic criteria
- 1960-70s aspiration cytology started to stick around the world
- 1991- Cytopathology exam and certificate, ACGME accredited



# Open biopsy

- General anesthetic
- Neck incision



# Morbidity and Mortality

- Open biopsies may lead to
  - Bleeding
  - Infection
  - Nerve injury
  - Nonhealing wounds

**Major haemorrhage requiring transarterial embolisation following open biopsy of an unusual neck mass**

M Walsh, M Supriya, N Railton



# Morbidity and Mortality

- Open biopsies may lead to
  - Bleeding
  - Infection
  - Nerve injury
  - Nonhealing wounds
  - Delay in definitive treatment
  - Regional recurrence
  - Distant metastasis
  - Decreased survival

**Major haemorrhage requiring transarterial embolisation following open biopsy of an unusual neck mass**

M Walsh, M Supriya, N Railton

Adjuvant radiation

# The violated neck

Original Research—Head and Neck Surgery

## Definitive Surgical Therapy after Open Neck Biopsy for HPV-Related Oropharyngeal Cancer

Joseph Zenga, MD<sup>1</sup>, Evan M. Graboyes, MD<sup>1</sup>,  
Bruce H. Haughey, MBChB, MS<sup>1</sup>,  
Randal C. Paniello, MD, PhD, MBA<sup>1</sup>,  
Mitra Mehrad, MD<sup>2</sup>, James S. Lewis Jr, MD<sup>3,4</sup>,  
Wade L. Thorstad, MD<sup>5</sup>, Brian Nussenbaum, MD<sup>1</sup>, and  
Jason T. Rich, MD<sup>1</sup>



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Head and Neck Surgery  
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Surgery Foundation 2016  
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DOI: 10.1177/0194599815627642  
http://otojournal.org  
SAGE

- 28/68 patients with HPV-SCC underwent open-biopsy prior to definitive surgical treatment (TOS/ND)
- 82% (n=37) excisional; 18% (n=8) incisional
- Excised prior scar
  - 3 cases (7%) had tumor deposits in the excised scar
- 20% complication rate (vs 12%, p=0.23)
  - 3 patients required flap reconstruction of cervical skin defect
- No disease/survival differences



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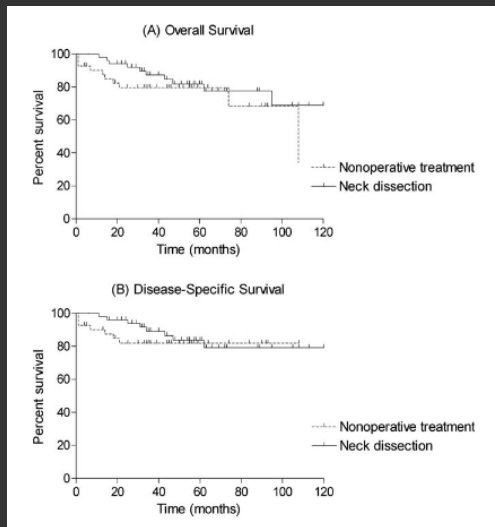


# The violated neck

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Rhinological and Otological Society, Inc.

## Management of the “Violated Neck” in the Era of Chemoradiation

Myriam Loyo, MD; Jonas T. Johnson, MD; William H. Westra, MD; Simion I. Chiosea, MD;  
Christine G. Gourin, MD, MPH



- 94 patients with prior open biopsy (84% OP; 87% HPV +)
    - 56% underwent completion neck dissection; 44% Non-operative management
      - ND group, 5 had no adjTx, 22 had RT alone, 26 had CRT
      - Non-op group: 5 had RT alone, 36 had CRT
- 5 year OS 82% vs 80%
- 5 year DSS 84% vs 82%



# FNA

- Accurate, safe and cost-effective
  - Overall accuracy of 93.1%
    - Regardless of anatomic site and final histologic diagnosis
    - Sensitivity 89.6%
    - Specificity 96.5%
    - PPV 96.2%
    - NPV 90.3%
  - Only rare major complications reported in literature (single case reports)
    - Outpatient procedure with local anesthesia
    - Few minor complications: infection, discomfort, bruising, not enough tissue
  - No Absolute contraindications
    - Anticoagulation
    - Vascular/pulsatile masses



# Tumor seeding- is it real?

- Systematic review 2016:
  - 5/41,468 FNA and 2/1803 Core
  - Metastatic melanoma, pleomorphic adenoma, adenoid cystic ca, adenocarcinoma, SCC, mucoepidermoid ca
  - 0.00012% after FNA and 0.0011% after core
- In other areas:
  - Pulmonary: 0.000367%
  - Liver: 0.13%
  - Breast: 0.2%
  - Prostate: 0.15-2.0%



# Guidelines



National Comprehensive  
Cancer Network®

- Comprehensive clinical examination should be accompanied by FNA as the primary diagnostic test
- Open neck mass biopsy should only be performed if an FNA is non-diagnostic




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HEAD AND NECK SURGERY

- Clinicians should perform FNA instead of open biopsy, or refer the patient to someone who can perform FNA, for patients with a neck mass deemed at increased risk for malignancy when the diagnosis of the neck mass remains uncertain
  - Strong recommendation
- Clinicians should recommend examination of the UAT under anesthesia, before open biopsy, for patients with a neck mass who are at increased risk for malignancy and without a diagnosis or primary site identified with FNA, imaging and/or ancillary tests
  - Recommendation

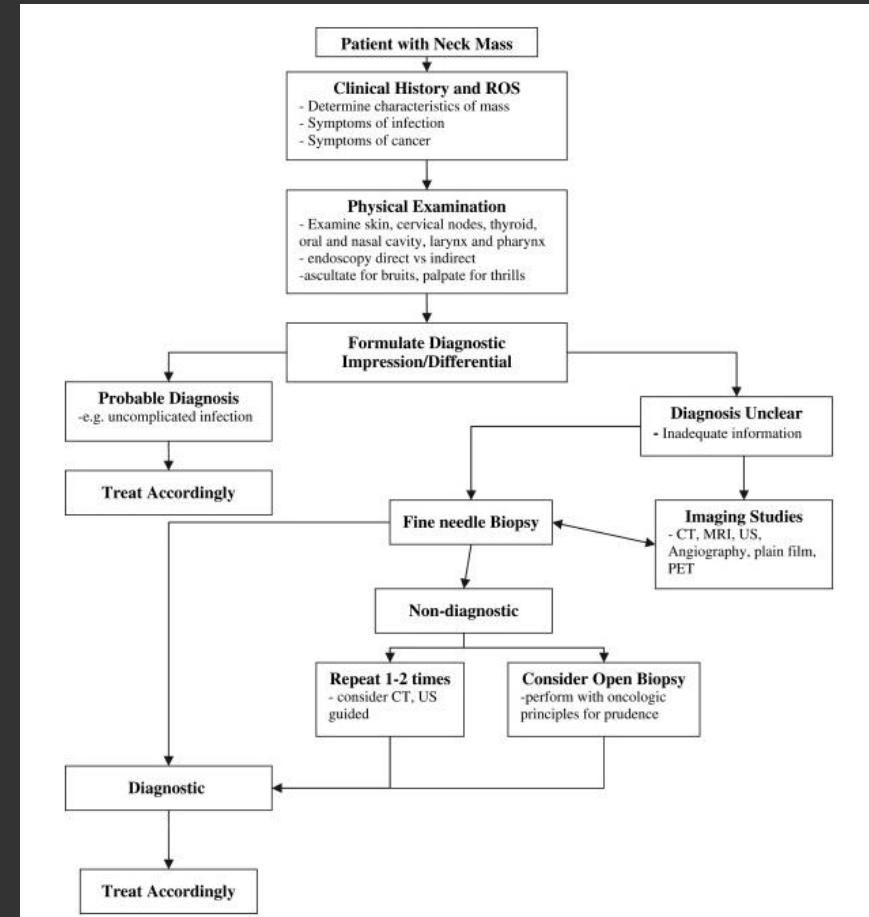
# Guidelines

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by Wiley Periodicals, Inc. on behalf of The Triological Society.

## The Current Practice of Open Neck Mass Biopsy in the Diagnosis of Head and Neck Cancer: A Retrospective Cohort Study

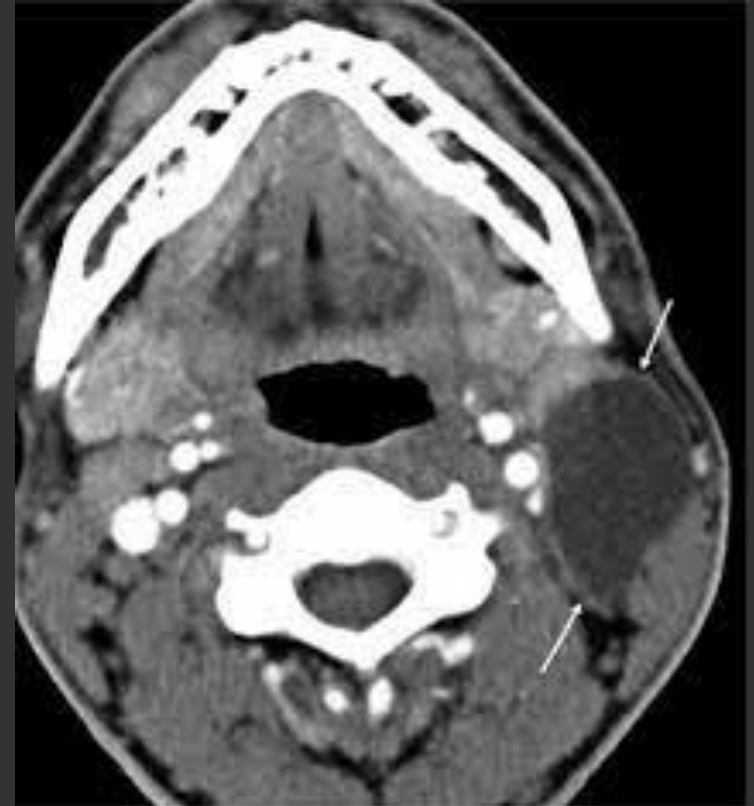
Sarah R. Akkina, MD, MS ; Roderick Y. Kim, DDS, MD; Chaz L. Stucken, MD;  
Melissa A. Pynnonen, MD, MS; Carol R. Bradford, MD

- 50/940 (5.3%) patients diagnosed with SCC via open neck mass biopsy
- 38% (19/50) received FNA prior to open biopsy



# Cystic masses

- Up to 62% of neck metastases from Waldeyer ring sites are cystic
- 10% of malignant cystic neck masses present without an obvious primary tumor
- Incidence of malignancy in a given cystic neck mass 4-24%
  - Increases to 80% in patients >40yo
- FNA recommended
  - Sensitivity 74%
  - Open excisional biopsy if needed



**Table 9.** Common Ancillary Tests for Evaluation of an Adult Neck Mass.<sup>a</sup>

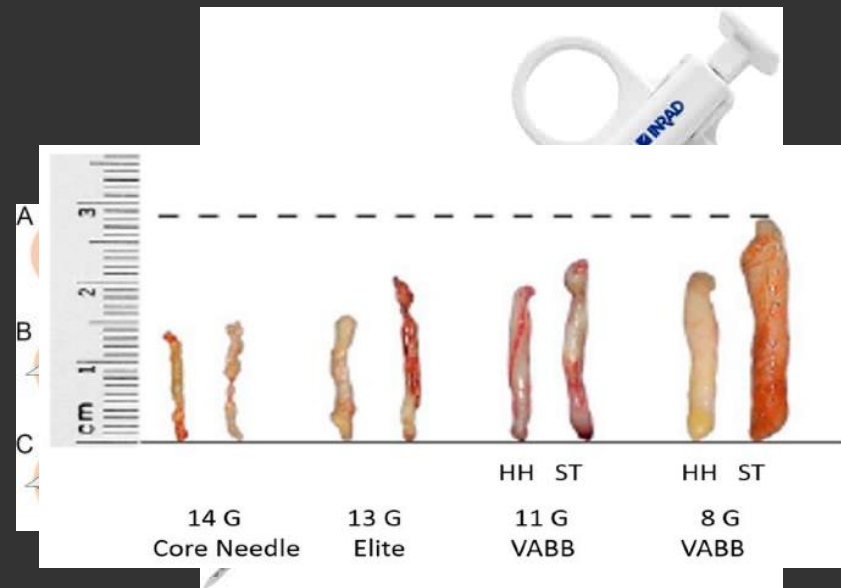
Ancillary Test	Suspected Disease
Complete blood count (CBC) with differential	WBC elevation: bacterial infection, lymphoma WBC depression: immunosuppression
Antineutrophil antibody (ANA); anti-Ro/SSA, anti-La/SSB	Autoimmune diseases such as Sjogren's syndrome or systemic lupus erythematosus (SLE)
Estimated sedimentation rate (ESR)	Autoimmune diseases as mentioned above; nonspecific marker for systemic inflammation
Thyroid-stimulating hormone (TSH)	Elevated: toxic multinodular goiter Decreased: Hashimoto's thyroiditis, Graves' disease
Parathyroid hormone (PTH)	Parathyroid adenoma/hyperplasia or carcinoma
HIV enzyme-linked assay	HIV infection
Epstein-Barr virus (EBV) antibody titers	EBV infection
CMV IgM titer	CMV infection
Mantoux tuberculin test (PPD)	Mycobacterium tuberculosis infection
Bartonella titer	Bartonella infection (cat-scratch disease)
Thyroid ultrasound	Thyroid nodule, thyroid goiter Parathyroid adenoma
CT chest with contrast	Mycobacterium tuberculosis, nontuberculosis atypical mycobacterium, sarcoidosis, lung malignancy
Thyroglobulin FNA-needle wash assay	Thyroid cancer

Abbreviations: CMV, cytomegalovirus; CT, computed tomography; FNA, fine-needle aspiration; PPD, purified protein derivative; WBC, white blood cell.

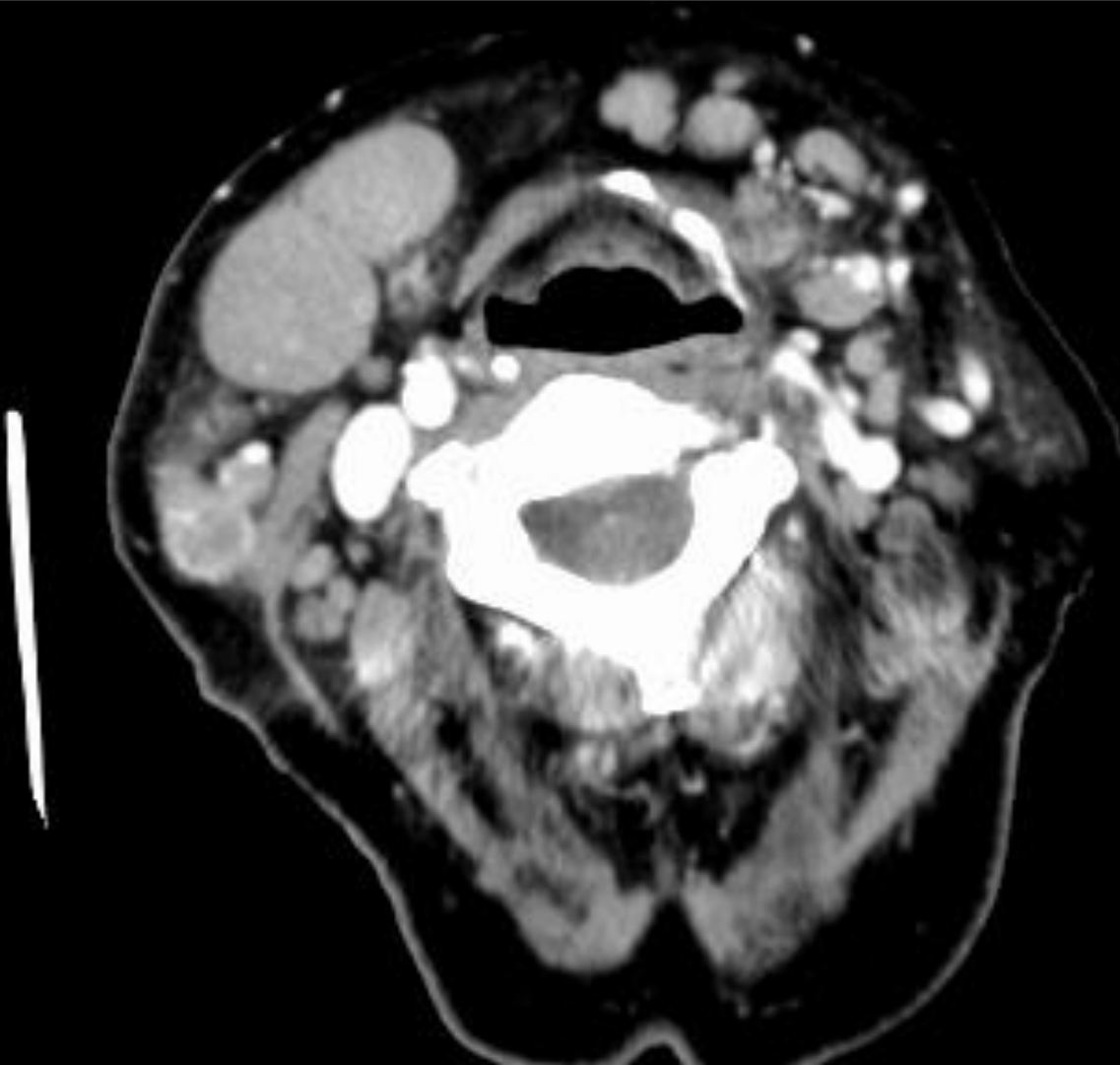
<sup>a</sup>Tests from this list should be chosen selectively, based on clinical suspicion. Ancillary testing should not delay workup of a possible malignancy.

# FNA

- Inadequate vs indeterminate result
  - Repeat FNA
    - On-site cytopathologist
  - Core-needle
    - Adequacy 95%
    - Accuracy 95%
    - Complications 1%
    - Lymphoma (92% vs 74% sensitivity)







# lymphoma

- Sooooo many lymphomas
  - Hodgkin lymphoma and non-Hodgkin lymphoma
  - Low grade, intermediate grade, high grade
  - B cell, T cell and NK cell
  - Small cell, mixed cell and large cell
- FNA- Wang et al. 2021
  - Systematic review 47 studies, 7268 patients, 19 studies used flow
  - Sensitivity 93%; specificity 97% ( as low as 25% and 25% respectively)
- FNA + FC- Meda et el. 2000
  - 275 patients
  - 158 (78%) definitive lymphoma diagnosis, 44 suggestive of lymphoma (32 tissue); 81 benign (26 tissue)
  - 67% of patients spared surgery

# lymphoma

- Core needle biopsy (CNB)
  - Quick vs delay diagnosis
  - Less-invasive
    - Fewer major complications (0% vs 4.6%, grade 3,  $p < .01$ )
    - Reasonable choice for poor surgical candidate
  - Lower cost

	Core Needle Biopsy	Open Biopsy
Hospital	\$587	\$2693
Radiologist	235	0
Surgeon	0	348
Anesthesia	0	488
<b>Total</b>	<b>\$822</b>	<b>\$3529</b>

# lymphoma

Image-guided core needle biopsy as the first-line diagnostic approach in lymphoproliferative disorders—A review of the current literature

Dale Seviar<sup>1</sup> | Mehreen Yousuff<sup>2</sup> | Zoe Chia<sup>3</sup> | Keith Ramesar<sup>4</sup> | Joel Newman<sup>1</sup>  
David C. Howlett<sup>2</sup>

- 9049 patients diagnosed by CNB
  - Diagnostic yield 79-97% (91.7%)
- 101 underwent open biopsy
  - Diagnostic yield 93-100% (97.5%)
- Cervical nodes: 82.5% diagnostic yield
- CNB limitations:
  - Inadequate tissue (necrotic nodes)
  - Fragmentation
  - Increased request for immunohistochemical staining

CLINICAL REVIEW

WILEY

## Core needle biopsy for diagnosing lymphoma in cervical lymphadenopathy: Meta-analysis

Anton Warshavsky MD<sup>1</sup> | Roni Rosen MD<sup>1</sup> | Chava Perry MD, PhD<sup>2</sup> |  
Nidal Muhanna MD, PhD<sup>1</sup> | Omer Ungar MD<sup>1</sup> |  
Narin Nard Carmel-Neiderman MD, MSc<sup>1</sup> | Dan M. Fliss MD<sup>1</sup> |  
Gilad Horowitz MD<sup>1</sup>



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# lymphoma

- Gold standard remains open biopsy

# The end