# Interventional Head & Neck: Tips & Tricks

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# Introduction

- Radiology plays a pivotal role in head and neck surgery and oncology; and in the management of patients with neoplastic diseases in the head and neck region.
- Image-guided interventional procedures provide a safe way to diagnose and treat a variety of head & neck abnormalities.
- The procedure time is usually short and most procedures can be performed on an out-patient basis.
- Knowledge about strengths and weaknesses, efficacy, potential complications and pitfalls of these procedures allows the best treatment to be chosen for a particular lesion type.

# Image-guided procedures in the head & neck

- Fine needle aspiration cytology (FNAC).
- Core biopsy.
- Ethanol injection ablation of neck nodal metastases from papillary thyroid cancer.
- Vocal cord injection for unilateral vocal cord paralysis.
- Radiofrequency ablation in recurrent well differentiated thyroid carcinoma (DTC).

# Fine needle aspiration cytology (FNAC)

- High resolution US is ideal in assessing most neck lesions and can determine their nature.
- Although sensitive in identifying the abnormality, it may lack specificity.
- US-guided FNAC therefore complements diagnostic US in evaluating head & neck lesions.
- Readily available, inexpensive, relatively non-invasive, well tolerated and rapid out-patient procedure.

# Fine needle aspiration cytology (FNAC)

- Diagnostic accuracy in malignant lymphadenopathy exceeding 90%
- However, there are still non-diagnostic FNAC samples – suboptimal smear prep, scanty aspirate or heavy blood contamination
- Incomplete classification –as could happen in thyroid cancers and lymphoma.

# Fine needle aspiration cytology (FNAC)

- The non-diagnostic rate for FNAC in head & neck lesions ranges from 10-30%, and is in part dependent on the cytologist's expertise.
- Repeating FNAC may become necessary –but could increase patients' anxiety and frustration.
- If the repeat FNAC is also non-diagnostic –then a core biopsy should be considered if the lesion is appropriate for a core biopsy.
- If the lesion is not core biopsy appropriate, then an MDT referral should be made.

# Fine needle aspiration cytology (FNAC)

- In our centre –FNAC is the image guided procedure of choice in the initial assessment of thyroid nodules, salivary gland lesions and other indeterminate cystic lesions.
- Core biopsy then follows if advised by the cytologist or following MDT discussion.

# Core needle biopsy (CNB)

- In certain circumstances, the referring team will request a core biopsy ab initio –suspected diagnosis that is difficult to make on FNA alone (lymphoma, differentiating p16 positive from p16 negative, EBV) or enrollment in a clinical trial which needs core tissue.
- Core biopsy yields large tissue samples with preserved architecture which together with immunohistochemical stains, provide precise histopathologic diagnosis.
- Kim et al reported sensitivity, specificity and accuracy of 97.9%, 99.1% and 97.9% respectively for US-guided core needle biopsy of cervical lymphadenopathy in patients with no known malignancy.

# Core needle biopsy (CNB)

- There is a lot of value in having a dedicated head & neck radiologist/sonographer perform image-guided core biopsy.
- Thorough knowledge of the neck imaging anatomy, normal and abnormal appearances of the postoperative/postradiotherapy neck, patterns of nodal spread for head & neck cancers.
- Review of other imaging modalities (CT, MRI, PET) relating to the pathology for which a core biopsy has been requested is also a very helpful practice.
- Participation in the MDT leads to familiarity with the case, especially in complex cases where there is >1 potential target for biopsy.

# Clinical Governance

NICE National Institute for Health and Care Excellence

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## Ultrasound guided fine needle aspiration (FNA) of thyroid nodules

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**Descriptor:**

Success rate of ultrasound guided fine needle aspiration of thyroid nodules – assessing the percentage of specimens which were adequate and representative for cytological diagnosis.

STANDARDS OF PRACTICE

## Society of Interventional Radiology Quality Improvement Standards for Image-Guided Percutaneous Drainage and Aspiration of Abscesses and Fluid Collections

Sean R. Dariushnia, MD, Jason W. Mitchell, MD, MPH, MBA, Gulraiz Chaudry, MBChB, MRCP, FRCR, and Mark J. Hogan, MD

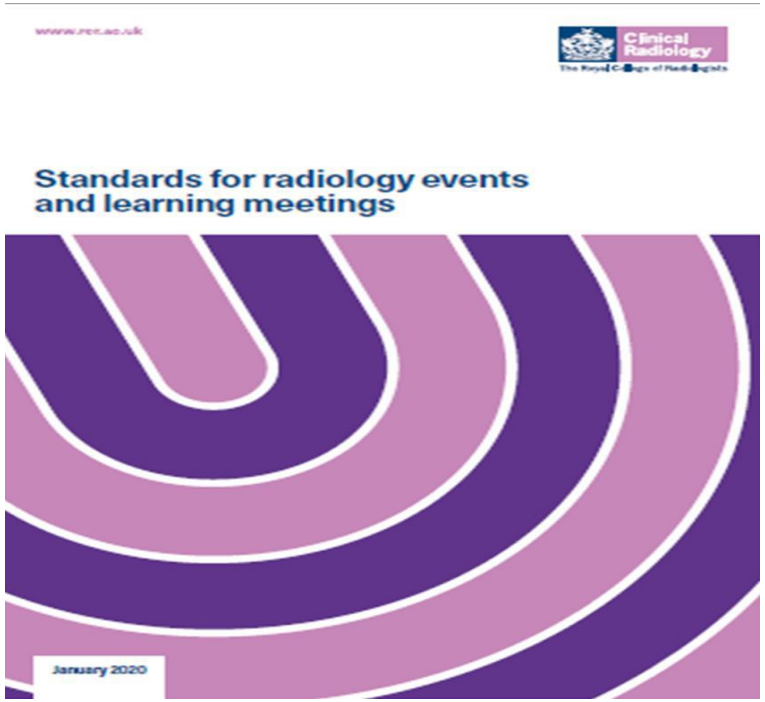
# Clinical Governance

- Get Governance Right First Time (GIRFT)
- Don’t wait for something to go wrong and then react
- Be reasonable and proportionate
- Ensure training standards (same standards for all)
- Quality improvement and safety standards
- Benchmarks for accountability
- Confidence in the service and the practitioners

# Clinical Governance

- Training competencies
- Protocols/Guidelines
- Local safety standards for invasive procedures (LocSSIPs)
- Consent
- PGDs/Independent prescribing
- WHO checklists
- Established clinical audit
- REALM
- Peer review

# Clinical Governance




Organisations endorsing WHO Surgical Safety Checklist:

The Association of Anaesthetists of Great Britain & Ireland
APP
CODP
DH Department of Health
Healthcare Commission
Independent Healthcare Advisory Services
The Royal College of Anaesthetists
Royal College of Nursing
The Royal College of Ophthalmologists
Royal College of Obstetricians and Gynaecologists
RCR The Royal College of Radiologists
The Royal College of Surgeons of England
Ymgyrch 1000 Lives Campaign
Llywodraeth Cymru Welsh Assembly Government
WHA
World Alliance for Patient Safety
1 Patient Safety First

# Practical Hints and Tips

- Knowledge of clinical, anatomy and pathophysiology is essential
- Knowledge of other imaging modalities, referral pathways and MDT
- Prior planning of the procedure prevents poor performance
- Know the tools for the job –FNAC vs Core needle biopsy
- FNAC: usually narrow gauge 22G to 25G needle (23G)
- Core needle biopsy 16G to 20G (16G Temno, Quick Core)

# Practical Hints and Tips

## Needle hints & tips

- Scan and get the best image for sampling
- Ensure you have decided your approach based on the surrounding structures
- Use your finger or needle hub to decide your approach
- Have a stable base for your hand
- Ambidextrous –learn to use both hands equally well

# Practical Hints and Tips

## Needle hints & tips

- Put the needle in –looking at the probe and needle initially and then the monitor to see the direction of the needle
- Find the needle tip and keep in view at all times
- Advance the needle until you hit the target
- If you can't see the tip of your needle –move the probe and NOT your needle
- https://youtu.be/yRFf2erCqpA?si=xh9zOptHVfDhU2dm

# Cytology/Histology/Microbiology

- Engage with the pathology team and know what they want
- Know what sample to send and how –in order to get the right answer
- Adequacy rates improve with well written request
- Make sure the slides are prepared and labelled correctly

# Patient Communication

- Make them aware of what's happening and why?
- Get informed consent (verbal/written)
- Kindness and attention
- Increases cooperation and the likelihood of a better sample
- Discuss aftercare
- Let them know what will happen next.
- In our centre, we make them a cup of tea/coffee and ask them to wait in the department for about 10 minutes

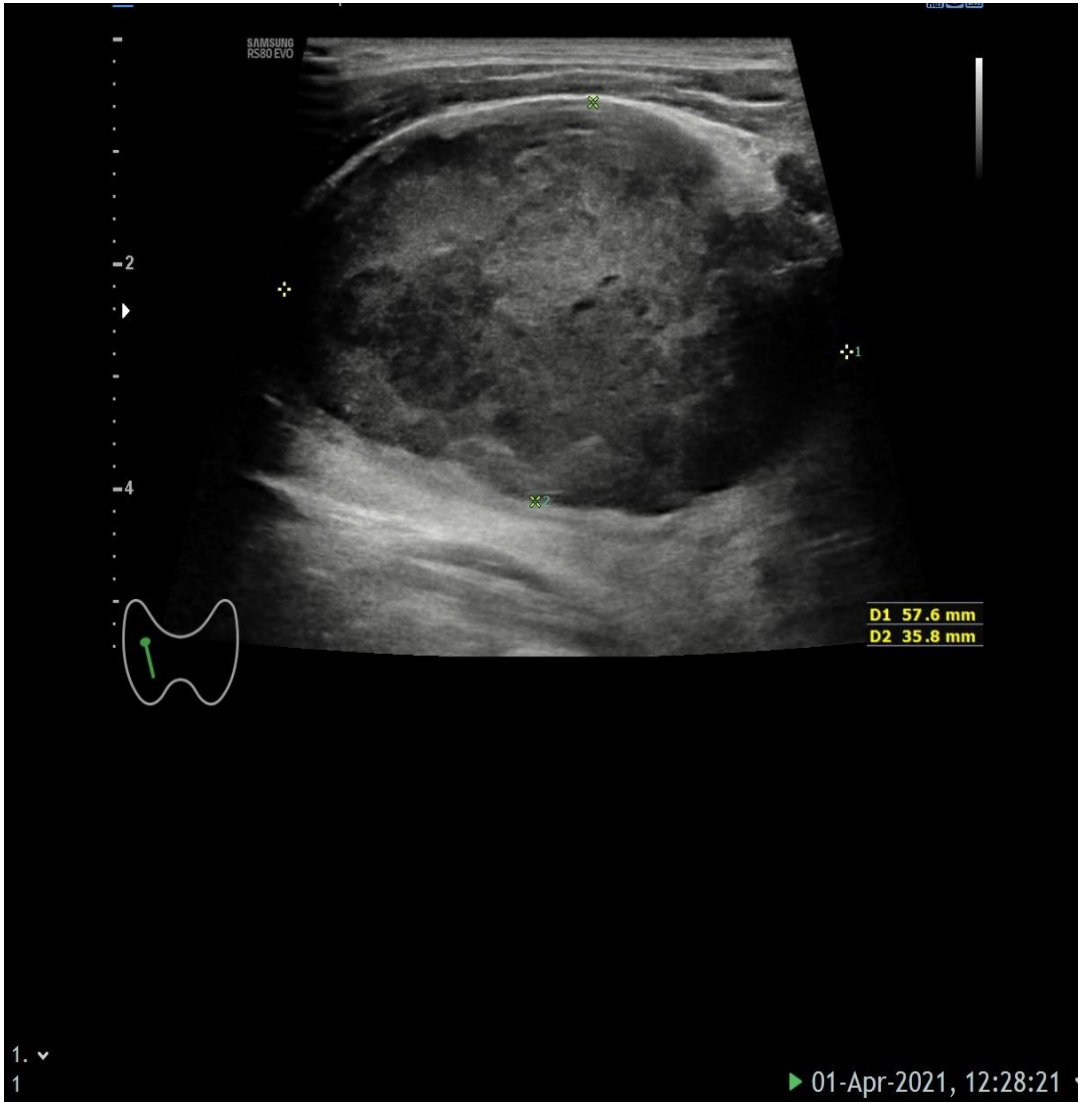
# Interesting Cases

- Case # 1
- Case # 2
- Case # 3
- Case # 4
- Case # 5

## Case # 1

A 63yr old male GP referral with 3.5 cm anterior neck swelling of sudden onset associated with sore throat, no weight loss, no change in appetite, ex-smoker. US revealed a 5.8 x 3.6 cm hypoechoic nodule in the right lobe of the thyroid gland; no internal or peripheral vascularity. No cervical lymphadenopathy.

1. Classification? (U3 or U4)?
2. What image guided procedure would you do? (FNAC or Core biopsy)



# Case # 1

Patient went on to have an FNAC and the cytology results came back as positive for malignant cells (THY 5) with the possibilities including anaplastic thyroid cancer, high grade lymphoma and melanoma. A core needle biopsy for further categorization and classification was advised.

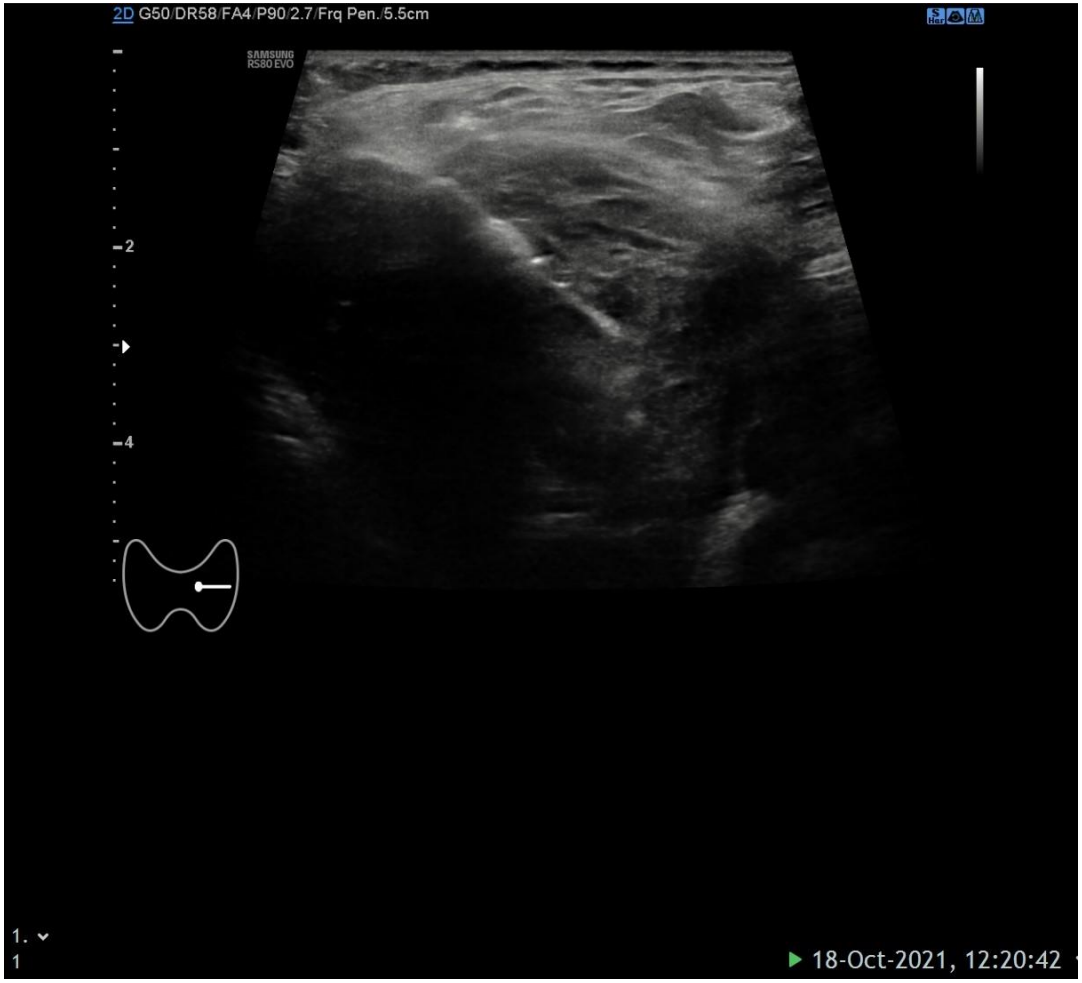
The core needle biopsy was done and the report came back as necrotic degenerate tumour in keeping with anaplastic carcinoma.

Patient went on to have a total thyroidectomy with right levels IIa, III & IV dissection –the final outcome was anaplastic carcinoma of the right lobe with no evidence of nodal metastasis.

# Case # 2

An 85yr old female known to have normocytic anaemia, had PET/CT to assess for haematological malignancy. PET/CT showed increased uptake in the left lobe of the thyroid gland with SUV of 77. Discussed at the haematology MDT who have recommended core needle biopsy.

Core needle biopsy was done and the histology showed trabeculae of thyroid epithelial cells showing Hurthle cell features –Hurthle cell follicular neoplasm



# Case # 3

A 36yr old male recently diagnosed with retroviral infection with PCP was referred from the infectious disease clinic with swelling of the neck –right neck lymph node 3 x 4 cm in size, soft, fluctuant -?IRIS ?TB abscess.

The USS showed three abnormal right level II cervical lymph nodes with the largest measuring 24 x 16 mm. The decision was to core the largest lymph node

Core needle biopsy was done and the histology showed fragmented core of tissue showing necrotizing granulomatous inflammation. Staining with ZN & MZN highlight very rare mycobacterial rods – overall features are suggestive of mycobacterial infection.

# Case # 4

A 72yr old female with significant smoking history, multiple lung nodules with mediastinal/axillary/cervical nodes, EBUS guided sampling of the subcarinal lymph node showed atypical cells suspicious of malignancy. Needs more tissue for definitive diagnosis & molecular studies. MDT plan is for USS guided core biopsy of either the supraclavicular/axillary LN.

The USS showed small volume right supraclavicular lymph nodes measuring up to 8 mm (SAD). No right axillary LN.

Core needle biopsy was done and the histology showed metastatic adenocarcinoma of primary lung origin. Material was sent for molecular testing.

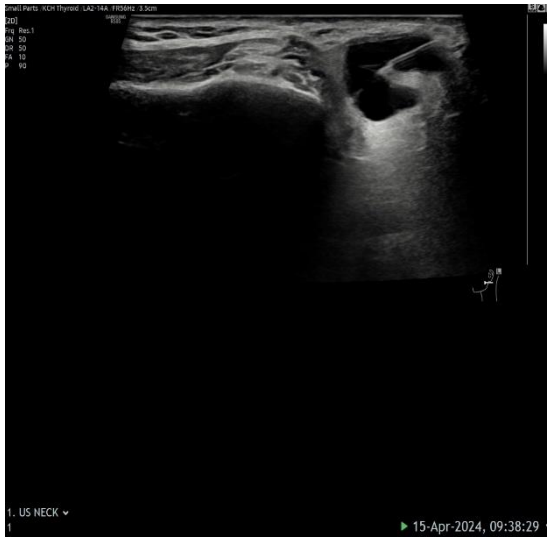
# Case # 5

An 80yr old male 2WW referral from ENT with a lump in the left parotid x 7yrs, 2 x 2 cm. For US +/- FNA/Core biopsy.

The USS showed a 19 mm well defined ovoid lobulated lesion with increased through in the superficial lobe of the left parotid gland. Normal right parotid & both SMGs.

At FNAC, 3mls of aspirate was drained from the cystic lesion achieving complete collapse of the lesion. 4 slides were prepared from the aspirate and sent for cytology; a sample was also sent to microbiology for m/c/s and AFB.

The cytology showed a paucicellular sample containing rare macrophages and lymphocytes –the specimen is best regarded as non-diagnostic.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# Thank you for your attention.