Thyroid Nodules

Incidence

Age

Palpation

50

30

70

100

50

Age
Incidence of malignancy?

- 1000 new cases per annum in England and Wales (0.002%) 
- 1 new case per 50,000, per year. 
- 250,000 population = 5 new cases/year 
- 500,000 population = 10 new cases/year.
Signs?

- 426 resected nodules, surgical correlation
- Benign nodules: iso/hyper-echoic and contain cystic degenerative change with a perinodular hypoechoic rim

Incidence of Papillary carcinoma?

- 6,499 patients: US and FNAC
- 164 cases (incidence: 2.52%) of malignancy:
  - 116 Papillary Ca
  - 23 Follicular Ca
  - 6 Medullary Ca
  - 7 Anaplastic Ca
  - 8 Hurthle Cell Ca
  - 4 Lymphomas

Occult Incidence.

- Autopsy series.
- Small (less than 1cm) papillary tumours: “micro-carcinomas”.
- Reported incidence: 10-30%.
Signs: papillary carcinoma?

• Combination of absent halo, microcalcification and type III (marked intranodular flow) most specific
• Specificity: 97.2%
• Sensitivity: 16.6%

Follicular carcinoma.
Follicular lesions.

- Spectrum from adenoma to carcinoma.
- 80% will be benign
- Follicular carcinoma – 10-15% of all thyroid Ca.
- Cytology of no use.
- Histology of no use in differentiation.
- Surgical specimen: vascular and capsular invasion – follicular carcinoma.
Ultrasound: follicular lesion.

2.96 cm
CBX: follicular lesion.
Map 3
170dB/C 2
Persist Off
2D Opt:FSCT
Fr Rate:Surv
SonoCT™

POST BIOPSY
Follicular lesions.

- Adenomas: solid, homogenous, iso/hyper-echoic.
- Well defined halo.
- Carcinoma: solid, hypo-echoic areas within.
Medullary carcinoma.
Medullary Carcinoma Thyroid

- Typically hypo-echoic.
- Contains calcification.
- Calcification more “globular”.
- “Calcification” may be amyloid.
Signs?
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Thyroid nodules.

- Sorting out nodules.
- Learn from others – Breast Radiologists.
- R Classification.
- Cytological classification(1 -5)
- Clinical scenario.
- Correctly manage patient.
Breast nodules – R classification.

1: Normal.
2: Probably benign.
3: Indeterminate.
4: Suspicious.
5: Malignant
Nodules – R classification……thyroid?

1 : Normal.
2 : Probably benign.
3 : Indeterminate.
4 : Suspicious.
5 : Malignant
R 2
Lymphoma
Thyroid nodules.

- R Classification.
- Cytological classification(1 -5)
- Clinical scenario.
- Correctly manage patient.
Case 1.
Case 2.
R 2 or 3?
Case 3.
FNA(x2) : non-diagnostic.
CBX: No features of malignancy, probable colloid nodule.
Case 4.
Case 5.
Parathyroid
Parathyroid Adenoma – localisation.

“the only localisation required is to localise an experienced parathyroid surgeon”
Localisation?

- Unilateral versus bilateral exploration?
- Minimally invasive surgery.
- Day case parathyroidectomy.
- Excision under local anaesthesia.
Localisation - patient.

• Reduce operating time.
• Decrease in post surgical complications.
• Safer and more cost effective procedure.
Parathyroid localisation.

- Problem?
- Unpredictability of anatomy.
Anatomy.

- 91% have 4 glands.
- 4% have 3 glands.
- 5% have 5 glands.
- (0.6% have six glands.)
Anatomical variation.

- Embryology!
Embryology – Superior Parathyroid.

- Superior parathyroid derives from 4th branchial pouch-lateral thyroid/C cell complex.
- Postero-lateral superior (mid)pole.
- Short embryological path – fairly constant anatomy.
Embryology – inferior parathyroid..

- Inferior gland – third branchial pouch.
- Descends with the thymus.
- Longer embryological route – more varied position.
- May lie within the fat of the thyro-thymic horn.
- Inferior parathyroids are likely to be intra-thyroid (not superior)
Localisation?

• Only 75% of abnormal parathyroids are found at the “normal” position.
Intra-thyroid adenoma.

- 4%?
- Usually the inferior parathyroid.
- Sub-capsular.
- Intra-thyroid.
Left inferior parathyroidectomy.

“Despite pre operative localisation and extensive search – no adenoma found”
“Missed adenomas”

• 104 re-operations.
• Positions of adenomas found.
• All amenable to a neck incision.
Ultrasound Technique

• Transverse imaging.
• Retro – thyroid region.
• Neck extension.
• Infra – thyroid region.
• Para-tracheal region.
• Carotid sheath.
• Tracheo- oesophageal groove.
Superior.
Extra-thyroid?

Differential diagnosis: thyroid nodules.
Inferior.
Differential diagnosis: lymph nodes.
Differential diagnosis: lymph nodes.
Ultrasound Technique
Our Practice?

• Surgery.
• Ultrasound first.
• Ultrasound negative – Sestamibi scanning.
• Sestamibi positive – occ. CT. (SPECT- CT)
• US & Sestamibi negative – failure of localisation.
Neath experience.

• Pre-operative localisation positive.
• Reduction in operating time – 30%.
• 75 mins with good predictability.
• Reduction in stress levels.
• Planning.
• Failed localisation : range 75 – 225 mins
Neath experience.

- 31 cases.
- Ultrasound sensitivity – 72%
- (True positive – 62%; False positive – 14%; False negative – 24%)
- Ultrasound plus Sestamibi – sensitivity 88%
Morriston experience.

- 32 patients analysed.
- 22 patients had adenoma identified on US.
- 19 had proven adenoma (True positive)
- 3 – no adenoma – false positive.
- 2 – lymph nodes, 1-thyroid nodule.
Results.

- 10/32 had negative US, 9 had adenoma proven (false neg), 1 had no adenoma identified at surgery.

- Ultrasound – Sens: 68%  
  PPV: 86%  
  NPV: 10%
Results

- Sestamibi scans on all US negative. (2 US positive)
- 12 patients: 7 positive-all proven (Tp)
- 5 negative (4 proven (F-ve))
- (1 disease negative.)
- Ultrasound plus Sestamibi – Sensitivity 70%.
Comparison?

- WJS review.
- 52 studies reviewed.
- Sens range from 39% to 90%.
- Highlights side/site differences in interpretation.
Accuracy.

- Side: 88% (left/right)
- Site: 81% (superior/inferior)
OO MASSAGE

2 FRONTAL
3 CEREBELLUM
4 PITUITARY GLAND
5 TEMPORAL AREA
6 NOSE
7 NECK
8 EYE
9 EAR
11 TRAPEZOID
12 THYROID GLANDS
13 PARATHYROID
14 LUNGS
15 STOMACH
16 DUODENUM
18 LIVER
19 GALL BLADDER
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