Tumors of Thyroid

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Classification

- **Benign**
  - Childhood Teratoma
  - Adenoma Papillary and Follicular

- **Malignant**
  - Follicular
    - Papillary
    - Follicular
    - Anaplastic
  - Parafolicular
    - Medullary
TUMORS OF THYROID TISSUE

BENIGN

- FOLLICULAR ADENOMA
  1. EMBRYONEAL
  2. FETAL
  3. SIMPLE
  4. COLLOID
  5. HURTHLE CELL

- PAPILLARY ADENOMA
Malignant Tumours

- DIFFERENTIATED ADENOCARCINOMA
  - PAPILLARY ANDENOCARCINOMA
    - Pure papillary, mixed Papillary and follicular
    - Tall cell Oxyphil and Solid
  - FOLLICULAR ADENOCARCINOMA
    - Hurthle – Cell Carcinoma
    - Oxyphilic carcinoma
    - Clear cell carcinoma
    - Insular carcinoma
  - MEDULLARY CARCINOMA

- UNDIFFERENTIATED ADENOCARCINOMA
  - SMALL – CELL (SOLID) TYPE
  - GIANT ANDE SPINDLE –CELL TYPES

- MISCELLENEOUS
  - Occult sclerosing carcinoma
  - Squamous-cell carcinoma
  - Lymphoma
  - Metastatic tumours
THYROID CARCINOMA IN ORDER OF INCREASING MALIGNANCY

- DIFFERENTI THYROID CANCER
  - PAPILLARY CARCINOMA 60
  - MIXED PAPILLARY AND FOLLICULAR FOLLICULAR CARCINOMA 17
  - MEDULLARY CARCINOMA 6
  - UNDIFFEREENTIATED THY. CAR. 13

1. SMALL CELL DIFFUSE CARCINOMA
2. SMALL CELL COMPACT CARCINOMA
3. LARGE CELL CARCINOMA
Tumors of Thyroid
Clinically Important

- **BENIGN**
  - Adenoma Follicular

- **MALIGNANT**
  - Papillary adenocarcinoma
  - Follicular carcinoma
  - Medullary carcinoma
  - Undifferentiated carcinoma
ADENOMA OF THYROID:

- Papillary Adenoma
- Follicular Adenoma:
  - Small:
    - Foetal,
    - Embryonal,
    - Microfollicular
  - Large:
    - Colloid,
    - Macrofollicular
  - Oxyphyl: Hurthle Cell.
ADENOMA OF THYROID

MACROSCOPY:

- Capsulated, round to avoid.
- Surrounding parenchyma normal.
- False capsule of compressed tissue
- Consistency varies with deg. changes.
  (Cystic changes, H’ags, Infarction, fibrosis calcification).
- Differentiate from MNG
Differentiate from Multi Nodular Goitre
ADENOMA OF THYROID

MACROSCOPY

Colloid adenoma
ADENOMA OF THYROID

MICROSCOPY:

- Varies with Cell Type
  Follicular size
  Degree of degeneration
- Complete capsule
- Compression of adjacent gland
- No lymphatic or vascular invasion.
ADENOMA OF THYROID

COMPLICATIONS

* Degenerative changes
* Acute Haemorrhage in gland
* Compression
* Hyperthyroidism
* Malignant change
Carcinogenesis:

Initiation:
- DNA Damage → Carcinogen in cell
  - Activated
  - Degraded
  - Capacity of Repair
  - Carcinogenesis
  - Cumulative effect.

Promotion:
- Selective stimulation of initiated Cells.
- Proliferation
- Hyperplasia
  - Long Exposure
  - Still Reversible
AETIOLOGY OF CARCINOMA. THYROID

- **Initiating Factor:**
  - Creates Permanent changes in Cell DNA
  - Mutation + Selection Gene Structure
  - DNA From Papillary Ca Oncogens trk. ret.

- **Promoting Factor:** TSH Stimulation
  - Iodine Deficiency
  - Goiterogenic Drugs Produce tumors in Exp animals.
  - I$^{131}$ Administration
  - Radiation Injury
AETIOLOGY OF CARCINOMA. THYROID

RADIATION & CA. THYROID

- Exposure of Head and Neck Region
  - Haemangioma
  - Ca. Breast
  - Acne vulgaris
  - Thymus
  Risk 5 to 10 times

- Hiroshima, Nagasaki
  High incidence

- Post-nuclear explosion
Chronic Low-grade exposure:

- Natural background irradiation
- Sea level 95 mR/yr
- Kerala Quilon Thorium in soil 1500 mR/yr.

Increased incidence of well differentiated Carcinoma in area
AETIOLOGY OF CARCINOMA THYROID
Contd

- **Genetic Factors:**
  - Medullary Car. Mendelian autosomal dominant, Chromosome 10

- **Conflicting Reports:**
  - Endemic Goitre: MNG
  - Follicular Adenoma
  - Auto immune Thyroiditis.
**PAPILLARY CARCINOMA**

**MICROSCOPY:**
Psammoma bodies

**Spread:**
Lymphatic

- Rich intrathyroidal Lymphatic Plexus
- Lymph node metastasis
  - Bigger than Primary
  - Better soil
  - Occult Primary

**Lateral Aberrant Thyroid**

**TSH DEPENDANT**

**Multiple Foci**
PAPILLARY CARCINOMA

Commonest of Ca. thyroid
Age 30 to 40 years.
3:1 F:M
Slow clinical course
Best Prognostic course

MACROSCOPY:
Grayish white tumour, Multifocal
Cut surface rough, calcific bodies
Cystic degeneration: Brawny, watery
Papillary carcinoma Microscopy

- Papillary processes
- Delicate branching with fibrous tissue stalk covered by multiple layers of cuboidal cells showing signs of malignancy.
- Each cell has amphophillic cytoplasm, Looks like hyper plastic Thyroid epithelium
- Nuclei are quiet uniform, seldom hyperchromotic, Rarely demonstrate mitosis
- Rounded calcific bodies – Psamoma bodies
- Highly characteristics of Papillary carcinoma
- Lymphatic invasion.
FOLLICULAR CARCINOMA:

Second Commonest, 40 to 50 years
M:F 1:3

MACROSCOPY:
- Woolner’s Classification
  1) Non Invasive:
     Single Mass, Grayish white Tumour
     Capsulated, looks like adenoma
     Similar degenerative changes
  2) Invasive:
     Noncapsulated

Types:
- Occult,
- Lower grade encapsulated
- High grade angio invasive
- Hurthle cell type (Multi centric)
- Clear cell type
- Insular
- Oxyphill
FOLLICULAR CARCINOMA:

- Spread by BLOOD
- Primary + Secondary look like normal gland
- They Function like normal gland Some times Hyper function
- LARGE IODINE UPTAKE
- TSH NON DEPENDANT
- BENIGN METASTISING GOITRE
- Toxic Nodule
- Sensitive to radioactive Iodine
- MULTIPLE FOCI RARE
Capsular Invasion
Vascular Invasion

Normal looking Thyroid

MICROSCOPY:
Follicular pattern comparable To Adenoma
Invasion has to be there Lymphatic, Capsular, Vascular

FOLLICULAR CARCINOMA
FOLLICULAR CARCINOMA
FOLLICULAR CARCINOMA
MEDULLARY CARCINOMA

- Parafollicular ‘C’ Cells.
- Apudoma

MULTIPLE ENDOCRINE ADENOMA SYNDROME
- TYPE II A. Sipple Syndrome
- II B. (Phaeochromocytoma, Parathyroid Adenoma, Carcinoid, GIT neurinoma)

Secretes 5 HT, prostaglandin, Histamine, Calcititonin.

GOITRE WITH EXTRATHYROIDAL SYM.
MEDULLARY CARCINOMA

**MICROSCOPY:**
Solid sheets of polyhedral cells, spindle shape
Hyperchromatic, Large amount of stroma

**AMYLOID DEPOSITION.**

**MACROSCOPY:**
Ill defined, non capsulated Tumour
Extremely firm

**Rare Tumour**
50 to 70 years
M>F

**Spread:** Lymphatic

**T.S.H. Non Dependent**
MEDULLARY CARCINOMA
<table>
<thead>
<tr>
<th></th>
<th>Papillary</th>
<th>Follicular</th>
<th>Anaplastic</th>
<th>Medullary</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>30-40</td>
<td>40-50</td>
<td>&gt;50</td>
<td>50-70</td>
</tr>
<tr>
<td><strong>Sex:M:F</strong></td>
<td>3:1</td>
<td>3:1</td>
<td>1.3: 1</td>
<td>M&gt;F</td>
</tr>
<tr>
<td><strong>Incidence</strong></td>
<td>Commonest 60%</td>
<td>2nd 17%</td>
<td>13%</td>
<td>Rare 6%</td>
</tr>
<tr>
<td><strong>Multiple foci</strong></td>
<td>Common</td>
<td>Rare</td>
<td>Rare</td>
<td>rare</td>
</tr>
<tr>
<td><strong>Spread</strong></td>
<td>Lymphatics</td>
<td>Blood born</td>
<td>Both invasive</td>
<td>Lymphatic 50-60 Blood born Incr.</td>
</tr>
<tr>
<td><strong>T.S.H</strong></td>
<td>Dependent</td>
<td>Not</td>
<td>Not dependent</td>
<td>Not dependent</td>
</tr>
<tr>
<td><strong>Iodine uptake</strong></td>
<td>Less</td>
<td>Normal</td>
<td>Less</td>
<td>no</td>
</tr>
<tr>
<td><strong>Prognosis</strong></td>
<td>Extremely good</td>
<td>Good</td>
<td>Worst</td>
<td>better</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td>Near Total Thyroidectomy thyroxin</td>
<td>Lobectomy radioidine</td>
<td>Radiotherapy</td>
<td>Radical thyroidectomy</td>
</tr>
</tbody>
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