MADRAS MEDICAL COLLEGE
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PROFESSOR OF SURGERY, MADRAS MEDICAL COLLEGE & RESEARCH INSTITUTE
CONSULTANT SURGICAL ENDOCRINOLOGIST
APOLLO HOSPITALS
THERE ARE COACHES WHO SPEND 18 HOURS A DAY COACHING THE PERFECT GAME. THEY STILL LOSE SOME GAMES BECAUSE THE BALL IS OVAL AND THEY CANNOT CONTROL THE BOUNCE.

BUDD GRANT
Ex. COACH OF MINNESOTA VIKINGS

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ADDRESSAL OF THE PROBLEM

- THYROIDECTOMY – MOST COMMONLY PERFORMED ENDOCRINE SURGERY
- REOPERATION IN THYROID - INCREASED INCIDENCE IN MALIGNANCY 14%
- INCREASED INCIDENCE OF RESURGERY - FOR BENIGN CONDITIONS OF THYROID (3%) DUE TO MORE CONSERVATIVE SURGERY FOLLOWED TODAY

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ADDRESSAL OF THE PROBLEM

REDUCTION IN REOPERATIONS CAN BE ACHIEVED BY OPTIMAL PRIMARY SURGERY AND AN ADEQUATE MULTIMODAL PROTOCOL POST OPERATIVELY

TURPIN G, DAMMAN M., LEENNARDT L., : SECOND THYROIDECTOMY IN PATIENTS WITH BENIGN THYROID DISEASE ; SURGERY : 126 ( 3) : 479 - 84 ; 1999 Sept.

TOTAL THYROIDECTOMY SPECIMEN

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INDICATIONS FOR REOPERATION

I. IMMEDIATE POST OPERATIVE (FOLLOWING PRIMARY SURGERY)
   - HEMATOMA
   - AIRWAY COLLAPSE
   - INFECTION

II. URGENTLY (SECOND OPERATION)
    - INCOMPLETE EXCISON
    - COMPLETION THYROIDECTOMY

III. RECURRENCE OF DISEASE
     - RECURRENT MALIGNANCY
     - RECURRENT NODULAR GOITRE
     - RECURRENT HYPERTHYROIDISM

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REOPERATION FOR RECURRENT OF DISEASE

- Technically challenging
- Legal implications
- Increased rate of intraoperative complications
- Follow up necessary
- Multimodal treatment protocol should be considered
THE INCISION...

- EXTENSIVE ELEVATION OF SKIN FLAPS MORE IN HORIZONTAL DISTANCE

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PRE OPERATIVE ASSESSMENT

DETAILED REVIEW OF FIRST PROCEDURE

- OPERATIVE NOTES
- POSSIBILITY OF RECURRENT LARYNGEAL N., EXT. LARYNGEAL NERVE INJURY
- PARATHYROID IDENTIFICATION /PRESERVATION

POST OPERATIVE COURSE

- TRANSIENT HYPOPARATHYROIDISM
MULTINODULAR GOITRE (DYSHORMOGENIC)
DYSHORMOGENIC GOITRE

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DISSECTION OF STRAP MUSCLES

DIVIDED HIGHER UP BECAUSE OF NERVE SUPPLY FROM BELOW
DISSECTION OF SUPERIOR POLE

DISSECTION OF SUPERIOR POLE

LIGATING THE SUPERIOR POLE

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MIDDLE THYROID VEIN
LIGATION OF LOWER POLE

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RECURRENT LARYNGEAL NERVE
DISSECTION OF ISTMUS
# Pre Operative Assessment

## Laboratory Indicators

<table>
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<tr>
<th>Laboratory Indicator</th>
<th>Condition/Condition</th>
<th>Date</th>
<th>Status</th>
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<td>Serum T&lt;sub&gt;3&lt;/sub&gt;, T&lt;sub&gt;4&lt;/sub&gt;</td>
<td>Recurrent Thyrotoxicosis</td>
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<tr>
<td>Serum TSH</td>
<td>Autonomic Functioning</td>
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<tr>
<td>Serum Ca, Phosphorus</td>
<td>Recurrent Medullary Carcinoma</td>
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<tr>
<td>Serum Calcitonin/CEA</td>
<td>Recurrent Medullary Carcinoma</td>
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<tr>
<td>Serum Thyroglobulin</td>
<td>Recurrent Papillary Carcinoma</td>
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PRE OPERATIVE ASSESSMENT
SECOND STAGING AND METASTASIS DETECTION

- C.T. NECK:
  - Tracheal / Thyroid cartilage invasion
  - Nodal status

- M.R.I - Coronal View:
  - Proximity of the tumor to larynx, trachea, deep vessels

- Laryngoscopy:
  - Integrity of R.L.N., Ext Br. of Superior Laryngeal nerve

- Thallium 201 Scan:
  - Detection of Vasc. secondaries

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CARCINOMA OF THE THYROID

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LIMITATIONS TO DIAGNOSIS AND STAGING

- ALTERED ANATOMY GIVES RISE TO OBSERVER, INTERPRETOR VARIATION IN STAGING
- NO STAGING SYSTEM AND DEFINITE PROTOCOL FOR RECURRENT TUMOR (Rustad et al.)
- NO LONG TERM CASE CONTROL STUDIES EVALUATING ANY TREATMENT MODALITY
OPERATIVE APPROACH

PROBLEMS ENCOUNTERED

- ALTERED ANATOMY DUE TO PREVIOUS SURGERY
- OBSCURENCE OF LANDMARKS NORMALLY USED TO AVOID DAMAGE TO R.L.N., PARA THYROID GLANDS
- IDENTIFICATION OF THE EXTENT OF LESION IN SUCH CIRCUMSTANCES POSES DIFFICULTIES
OPERATIVE APPROACH

APPROACH TO IDENTIFICATION OF RLN/PARATHYROIDS SHOULD BE THROUGH NORMAL TISSUE PLANES

THIS IS ACHIEVED BY

1. EXTENSIVE ELAVATION OF SKIN FLAPS MORE IN HORIZONTAL DISTANCE THAN THE FIRST OPERATION
2. EXPOSURE OF FIXED LANDMARKS - STERNOCLEAVICULAR JOINT AND THYROID CARTILAGE PROMINENCE, TRACHEO- OESOPHAGIAL GROOVE

Contd…….
OPERATIVE APPROACH

APPROACH TO IDENTIFICATION OF RLN/PARATHYROIDS SHOULD BE THROUGH NORMAL TISSUE PLANES

THIS IS ACHIEVED BY……

- DEVELOPING A PLANE OF DISSECTION BETWEEN THE STERNOHYOID AND STERNOTHYROID MUSCLES (STRAP MUSCLES)
- LATERAL RETRACTION OF STERNOHYOID EXPOSES INVESTING FASCIA OF THYROID WHICH IS INCISED.
ANAPLASTIC CARCINOMA
RECURRENT MEDULLARY CARCINOMA

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RESIDUAL MEDULLARY CARCINOMA
MEDULLARY CARCINOMA
IF THE STRAP MUSCLES ARE ADHERENT .... ?

A PLANE IS DEVELOPED BETWEEN THE STERNOCLEIDOMASTOID LATERALLY AND THE STRAP MUSCLES MEDIANALLY THIS DEMONSTRATES THE INVESTING LAYER OF FASCIA OVER THE THYROID
IDENTIFICATION OF RECURRENT LARYNGEAL NERVE

- Identified in a ‘virgin field’ as it emerges from the superior mediastinum into the neck.
- Rt. RLN - increased risk due to oblique course.
- Lt. RLN - lies in the tracheo oesophageal sulcus.
- The oesophagus is identified early and any displacement from the midline is noted.

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TECHNIQUE OF CAPSULAR DISSECTION

( RLN, PARA THYROID PRESERVATION )

KURIHARAH, TAKAYASHI, HARNESS et al

- POSTERIOR ASPECT OF GLAND UNDISTURBED DURING FIRST SURGERY
- LOWER POLE MOBILISED BY INDIVIDUAL LIGATION OF ARTERIES AND VEINS OF THYROID CAPSULE
- DISSECTION OF LOWER POLE OF THYROID GLAND WITH PARA THYROID PRESERVATION
- IDENTIFICATION OF RLN AT A LATER STAGE AS IT COURSES THROUGH THE LIGAMENT OF BERRY
- IF SIGNIFICANT RISK OF INJURY IS PRESENT A CUFF OF THYROID TISSUE ENCLOSING THE NERVE IS LEFT
RECURRENT PAPILLARY CARCINOMA
COMPLICATION OF
RESURGERY ON THYROID
GLAND

1) INJURY TO RECURRENT LARYNGEAL NERVE (3.7%)
2) INJURY TO EXTERNAL LARYNGEAL BRANCH OF SUPERIOR
   LARYNGEAL NERVE (NERVE OF GALLE - CURCI)
3) LOSS OF PARA THYROID FUNCTION (2.6%)
4) INJURY TO SYMPATHETIC CHAIN OR GANGLIA
5) PHRENIC NERVE INJURY (0.03%)
6) THORACIC DUCT INJURY (0.01%)

CHAOTC, JENG LE, LIN TO: Completion Thyroidectomy for Thyroid Carcinoma; Otolaryngology -
REOPERATION AND SUSCEPTIBILITY TO COMPLICATIONS

VASCULAR COMPROMISE

→ PREVIOUS SURGERY - ASSOCIATED FIBROSIS LEADS TO COMPROMISE OF BLOOD SUPPLY TO THE PARATHYROID GLAND AND RLN

→ INCREASED SUSCEPTIBILITY OF INJURY TO THE PARA THYROID GLAND DURING RESURGERY

→ A PROLONGED NEUROPRAXIA MAY OCCUR AFTER SURGERY TAKING WEEKS OR MONTHS FOR RECOVERY DUE TO ITS POOR VASCULAR SUPPLY

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AUTOTRANSPLANTATION OF PARATHYROID IN THYROID RESURGERY

- Following resurgery parathyroids are autotransplanted to the forearm.
- Autotransplantation to the neck is avoided because post operative neck irradiation may be indicated.
- Forearm implantation facilitates assay of PTH levels by forearm venipuncture.

TOTAL THYROIDECTOMY - PARATHYROID

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PARATHYROIDs
AIDS IN INTRAOPERATIVE LOCALISATION

- Minimisation of risk to recurrent laryngeal nerve
  - Repeated electrical stimulation identification
- Para thyroids
- Radionuclide scanning with intraoperative gamma probe
- Selective venous sampling for P.T.H.
- Medullary Ca. thyroid
  - Selective site specific venous catheterisation for calcitonin levels

BARRACLOUGH BH, REEVES TS, POSTOPERATIVE COMPLICATIONS OF THYROIDECTOMY: AUS NZ JOUR OF SURGERY; 45: 24; 1994

BONY METASTASES IN FOLLICULAR CARCINOMA
SECONDARY DEPOSITS IN THE LUNG IN A CASE OF FOLLICULAR Ca.
ILIAC BONE SECONDARY DEPOSIT IN FOLLICULAR CARCINOMA THYROID

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EMERGENCY THYROID SURGERY - LARYNGEAL OEDEMA

- In patients undergoing thyroidectomy with extensive neck dissection
- Development of post-operative laryngeal oedema
- If associated RLN injury results in imminent airway obstruction requiring intubation / tracheostomy
- If tracheostomy is performed skin is sutured to the trachea all around thus preventing infection

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THYROIDECTOMY - SECOND STAGE AND RADIOIODINE

- FOR METASTATIC WELL DIFFERENTIATED CARCINOMA
- IF PRIMARY SURGERY IS LESS THAN A TOTAL THYROIDECTOMY - SECOND SURGERY IS DONE
- THIS FACILITATES THE UPTAKE OF RADIOIODINE IN THE PRIMARY AND METASTATIC LESION

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RECURRENT PAPILLARY OR FOLLICULAR CARCINOMA

- INCIDENCE 7%
- IF LESION IS PALPABLE - COMPLETION THYROIDECTOMY
- IF LESION IS NON PALPABLE (i.e. IDENTIFIED BY RADIONUCLIDE SCAN) – RADIO IODINE IS INDICATED

JACKSON C.E, FROHLICH J.W., BLOCK M.A, TREATMENT OF RECURRENCE IN THYROID CANCER, SURGERY: 98 (6) ; 1189-96; 1999 DEC.
RECURRENT NODULAR GOITRE

- OCCURS IN 2.5 – 9% OF PATIENTS UNDERGOING PARTIAL THYROIDECTOMY
- TSH DEPENDANT RECURRENCE IS COMMON
- SUPPRESSIVE THERAPY INDICATED AS FIRST LINE TREATMENT

INDICATIONS FOR RESURGERY*
- NO RESPONSE TO SUPPRESSIVE THERAPY
- SYMPTOMATIC GOITRE
- PROGRESSIVE ENLARGEMENT

*HEALD R.J., MORON. B.J., RYALL.R.D, MaCFARLANE: RECURRENT NODULAR GOITRE: ARCH SURG 133(8): 894-9; AUG 1998
EMBRYONAL COLLOID GOITRE

DEC 2000       NDR
<table>
<thead>
<tr>
<th>AUTHOR</th>
<th>NO OF PATIENTS</th>
<th>PERIOD OF STUDY</th>
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<td>Modigliani et al*</td>
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<td>Toubert ME</td>
<td>310</td>
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<td>Dorairajan N et al</td>
<td>672</td>
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**BJS: 85(4) : 526-9 1998 APR**
## Graves Disease

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<td>N YEAR</td>
<td>RLN Palsy %</td>
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<tr>
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<tr>
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<td>150</td>
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BJS: 85(4) : 526-9 1998 APR

DEC 2000 NDR
## COMPARISON RATES FOLLOWING REOPERATIVE SURGERY ON THYROID FOR CARCINOMA

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<thead>
<tr>
<th>AUTHOR</th>
<th>NO OF PATIENTS</th>
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<th>HEMATOMA %</th>
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<tr>
<td>Menegaux et al</td>
<td>143</td>
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<tr>
<td>Talbot et al</td>
<td>258</td>
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European Journal of Surgical Oncology 24(4) : 283-7,1998
### Recurrence Rate Following Surgery for Thyroid Malignancy at G.G.H. Chennai (1979-1999)

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<tr>
<th>HISTOLOGICAL TYPE</th>
<th>PRIMARY SURGERY DONE n</th>
<th>SURGERY FOR RECURRENCE n</th>
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<tr>
<td>Papillary</td>
<td>1396</td>
<td>181</td>
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<td>Follicular</td>
<td>869</td>
<td>169</td>
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<td>Medullary</td>
<td>74</td>
<td>22</td>
<td>27</td>
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<td>Hurthle</td>
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## Recurrence Rate Following Surgery for Benign Thyroid Disease at G.G.H. Chennai (1979-1999)

<table>
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<th>HISTOLOGICAL TYPE</th>
<th>PRIMARY SURGERY DONE</th>
<th>SURGERY FOR RECURRENCE</th>
<th>% RECURRENCE</th>
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<td>MULTINODULAR GOITRE</td>
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<td>GRAVES DISEASE</td>
<td>1620</td>
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RECURRENT HYPERTHYROIDISM

→ RADIO IODINE – TREATMENT OF CHOICE EVEN IN PRESENCE OF RECURRENT THYROTOXICOSIS IN AN OPERATED NODULAR GOITRE

→ INDICATION FOR SURGERY
  - LOCAL EXCISION OF NODULE IF PRESENT DUE TO FEAR OF MALIGNANCY
REOPERATION FOLLOWING THYROID SURGERY AT THE GGH BETWEEN SEPTEMBER 1979 TO SEPTEMBER 1999 (20 YEARS)

- THYROIDECTOMIES DONE – 8687
  - MALIGNANCY – 2443
  - BENIGN – 6244

- NEAR TOTAL THYROIDECTOMY – 3214

- SUBTOTAL THYROIDECTOMY – 2114

- HEMI THYROIDECTOMY – 3359

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FOLLICULAR CARCINOMA

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PAPILLARY CARCINOMA WITH CERVICAL LYMPH NODAL SECONDARIES

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EMERGENCY THYROID AIRWAY OBSTRUCTION

- TRACHEAL COMPRESSION - HEMATOMA
- TRACHEAL COLLAPSE - INHERENT WEAKNESS OF TRACHEAL WALL
- VOCAL CORD PARALYSIS - BILATERAL RLN INJURY
PAPILLARY CARCINOMA WITH CERVICAL LYMPH NODE
PAPILLARY CARCINOMA WITH CERVICAL LYMPH NODE

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PAPILLARY CARCINOMA
(OCCULT)

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SOLITARY NODULE OF THYROID

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POST THYROID SURGERY – HEMATOMA FORMATION

CAUSES:

➔ INSECURE LIGATION OF UPPER/LOWER POLE
➔ INSECURE LIGATION OF M.T.V
➔ BLEED FROM CUT END OF STRAP MUSCLES

PREVENTION:

➔ DOUBLE LIGATION OF SUPERIOR AND INFERIOR POLES
➔ SUTURE BACK STRAP MUSCLES AFTER CUTTING
➔ AVOID EXTENSION OF NECK WHILE CLOSING WOUND
➔ AVOID RAISING SKIN FLAPS
THYROID CYST

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POST THYROID SURGERY – TRACHEAL COLLAPSE

CAUSES:

- PROLONGED COMPRESSION DUE TO LONG STANDING SWELLING
- DECREASED BLOOD SUPPLY - (PRESSURE NECROSIS OF TRACHEAL CARTILAGE)
- DISSECTION OF THYROID FROM TRACHEA IN THIS SETTING

TRACHEAL COLLAPSE

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CARCINOMA THYROID

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PAPILLARY CARCINOMA

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POST THYROID SURGERY – TRACHEAL COLLAPSE

PREVENTION:
- PROLONGED ENDOTRACHEAL INTUBATION.
- GENTLE DISSECTION OF THYROID FROM ITS BED
CARCINOMA
THYROID
ADHERENT
TO TRACHEA
RETROSTERNAL EXTENSION IN A CASE OF PAPILLARY Ca.
FIBROSARCOMA THYROID

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PAPILLARY CARCINOMA
MANAGEMENT OF AIRWAY OBSTRUCTION

- Reintubation - Endotracheal Tube
- Cricothyroidotomy
- Jet Ventilation
- Definitive Management
- Tracheostomy

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THE ESSENCE OF WISDOM IS THE ABILITY TO MAKE THE RIGHT DECISION ON THE BASIS OF INADEQUATE EVIDENCE

ALAN GREGG
Thank you