Surgery for thyroid cancers – how much is optimum?

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Almost 100 years ago, the discussion on the extent of thyroid resection for benign and malignant disease started. The question is still being addressed in many retrospective trials?? Remains controversial.
Surgical therapy for DTC remains an ongoing controversy!!

- Despite available clear guidelines, classification of patients into high and low risk difficult during surgery *
- Lack of prospective RCT due to a large number of patients with thyroid carcinomas and long term follow up needed for statistically significant statements

Total vs the rest

- Proponents and opponents
- Multicentricity as an issue
- Issues regarding complications
- Equally good with minimal complications (less is more!!)
- High vs low volume center
- Learning curve
Histopathologic types

- Papillary carcinoma (including follicular variant of papillary CA)
- Follicular CA (including Hurthle cell CA)
- Medullary carcinoma (special scenario)
- Undifferentiated (anaplastic) CA
Distribution

- Majority differentiated cancer [most prevalent in young adult with female to male ratio of 2:1]
- Histology varying from pure papillary to follicular carcinoma, Hurthle cell carcinoma
- Most instances mixed papillary & follicular
- 2-4% patients have anaplastic carcinoma
- 4% patients have medullary carcinoma
- Esoteric variants => tall cell variant of papillary & insular carcinoma
Differentiated thyroid cancers in children

- More aggressive
- More likely to present with extracapsular spread and lymph node/distant metastases.
- Overall survival is still over 90%**
- Younger patients/residual cervical disease after thyroidectomy at greater risk of recurrence

Impact of lymph node metastases on outcome

“Lymph node metastases have a bearing on outcome in medullary carcinoma but not on papillary and/or follicular in terms of overall survival”

*Weber et al. current opinions in oncology 2006,18:30-35
Total thyroidectomy - Indications!!

- Distant metastases
- Diffuse involvement of the entire thyroid gland
- Gross invasion of both lobes by multifocal nodules
- Gross major extra-thyroidal extension of cancer
Goals of treatment

- **Cure** of cancer with minimal or no impact on QOL.
- Surgically **optimal local control** mandatory.
- Strive for no or minimal complications.
- Distant metastasis: adequate surgery to facilitate optimum systemic treatment with RAI.
- Medullary carcinoma: TT with CND.
- If small, intra-thyroidal sporadic MTC, case may be made for ipsilateral lobectomy [controversial??]
- END vs classic neck dissection.
- Anaplastic: Tissue diagnosis/management of airway.
Can the surgery be tailored? - Risk stratification

Memorial hospital
GAMES
- Grade
- Age
- Metastases
- Extension
- Size

Mayo clinic, 1987
AGES
- Age
- Grade
- Extension
- Size
Tailoring the therapy

Mayo clinic, 1993
MACIS
• Distant Metastasis
• Age
• Completeness of resection
• Invasion
• Size

Lahey Clinic
AMES
• Age
• Metastases
• Extension
• Size
Karolinska Institute

DAMES
- DNA
- Age
- Metastases
- Extension
- Size
Absence of microfollicular basement membrane: a new indicator in the diagnosis of follicular carcinoma thyroid.

Chintamani, Sahoo M, Sekhri T, Tripathi M, Rautela N, Solanki Y.
Risk groups and selection of surgery

- **Low risk patient & tumour**: Hemi-thyroidectomy
- **Low risk patient & high risk tumour**: Hemi-thyroidectomy/TT depending on the local extent and distant metastasis
- **High risk patient & low risk tumour**: Hemi-thyroidectomy
- **High risk patient & high risk tumour**: Total Thyroidectomy
“In theory there is no difference between theory and practice but in practice there is”

.....JA Snepschant
Decision based on the type of tumour

(Primary SCC Of Thyroid)

Chintamani et al. *Int Semin Surg Oncol.* 2007 Mar 27;4:8
Validity of scoring systems

- Excellent prognostic statements by using these systems
- Factors like extrathyroidal extension or completeness of thyroid excision are not known before surgery
- Risk group classification are useful for the patients` follow-up and the decision of adjuvant therapy, but not completely reliable before surgery.
Thyroidectomy—should scoring systems to be followed as Gospels?

• *Most surgeons favour TT/NTT for WDTC >1cm
• **Significant effect of TT on disease recurrence, but not cause specific mortality rates in WDTC
• ***Patients developing lung metastases during a mean follow up of 7.9 years displayed more remnant tissue in $^{131}$I scanning and higher thyroglobulin levels after surgery.

** Cushing et al. Laryngoscope 2004;114;2110-2115
*** Lin et al. Thyroid 2004;14:1104-1106
AACE & the AAES-Guidelines

- **Lobectomy** for suspicious nodules (follicular/Hurthle cell neoplasms on FNAC)
- **Lobectomy** for minimally invasive WDTC(<1cm) not extending beyond thyroid capsule.
- **Total/NT thyroidectomy** for high risk PTC & FTC[ tumour extends beyond thyroid capsule or local/distant metastases present]
- **Nodal disease in level-VI,II,III,IV** –FND/SND
NCI database

• 5432 patients with PTC
• Overall survival was 93% at 5-years, 86% at 10 years.
• Using AMES risk classification: 10-year survival rate 89% in low-risk group, 73% in high-risk group
• After median follow up of 7.9 years survival not significantly influenced by the extent of thyroidectomy
• RAI improved survival rates in all groups

“Opposite of a correct statement is a false statement.
The opposite of a profound truth may well be another profound truth”

…………..Niels Bohr
Total thyroidectomy or thyroid lobectomy in patients with low-risk differentiated thyroid cancer - surgical decision analysis of a controversy using a mathematical model


Kebebew E, Duh QY, Clark OH.

The analysis indicates that TT in patients with low risk DTC is preferable to TL. However, TL is preferred if (1) no difference in the DTC recurrence rate between the two approaches is assumed, (2) a higher complication rate for TT is used (> 33 times higher), or (3) the utility ratio of thyroidectomy complication to DTC recurrence is < 0.8

TL This decision analysis model provides an objective approach to select the optimal extent of thyroidectomy based on patient preference of health outcome states, institution-specific outcome data for DTC recurrence or mortality, and the surgeon-specific complication rate.
USG & USFNA

*Analysis of reasons for re-operations for persistent and recurrent PTC showed that 82% of persistent PTC could have been prevented by using USG pre-operatively to diagnose tumour and enlarged cervical lymph nodes as well as by performing TT or NTT.

• **Accuracy of US guided fine-needle aspiration cytology in patients with thyroid neoplasms


The ultimate prognostic factors

**Patient**
- Age
- Gender

**Tumor**
- Grade
- Size
- Extent
- Metastases
The ultimate prognostic factors

Patient
- Age
- Gender

Tumor
- Grade
- Size
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AND

SURGEON
Rare scenarios!!

- Primary squamous cell carcinoma
- Aggressive WDTC
- No facility for radioactive iodine ablation
- Lymphomas
- Sarcomas
Is an aggressive approach justified in the management of an aggressive cancer--the squamous cell carcinoma of thyroid?

Lymph node dissection in DTC

- LN => 40-64% PTC
- FTC => 15-19%
- Europe/Japan: systematic LND recommended
- USG an important localizing modality
- Berry picking should be condemned
- TT/NTT with CND in PTC in children
Conclusions

• The optimum surgery would depend on the patient/tumour/surgeon/center
• High vs low risk patient and tumours
• Intermediate risk: decision based on various factors weighing the risks and benefits
• Total vs NT vs others
• If the follow up poor, no protocol of risk assessment followed => TT
• Medullary cancer => TT with CND except for sporadic and small lesions
• Minimum surgery in thyroid cancers is hemi-thyroidectomy.
• “Indian solution for an Indian problem”
Sometimes less is more??

“We are not retreating—we are advancing in another direction”

.......General Douglas Macarthur