

Medullary Thyroid Cancers – Surgery

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Medullary Thyroid Carcinoma “ Surgical Disease”

- Not so rare a disease
- 1-2% of all thyroid cancers, earlier 5-10%
- Radio-iodine resistant – radioisotope treatment limited to PRRT
- Radio resistant - role as adjuvant , metastatic disease and palliation
- Chemo resistant - till recent discovery of vandetinib , carbozantinib
- Therefore surgery has , is and will be the the mainstay of treatment

Medullary Thyroid Cancer - Surgery

- Surgery on the thyroid
- Neck – Central and Lateral
- Parathyroids
- Locally advanced cancers
- Hereditary/ Prophylactic

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Medullary Thyroid Carcinoma

Surgery on thyroid

Surgery – “Total thyroidectomy”

- Multicentricity 2- 20 % sporadic forms (av. 10%)
 80- 100 % familial forms
- Index case of familial form (4-16%)

Medullary Thyroid Carcinoma Role of Hemithyroidectomy ?

- Limited role
- Particularly if surprise - after hemi thyroidectomy
- RET negative, normal calcitonin, imaging negative
- Miyanuchi et al – selected cases
12/ 15 biochemical cure (80%)
T , N Stage affected outcome, not related to extent of thyroidectomy

Medullary Thyroid Cancer - Surgery

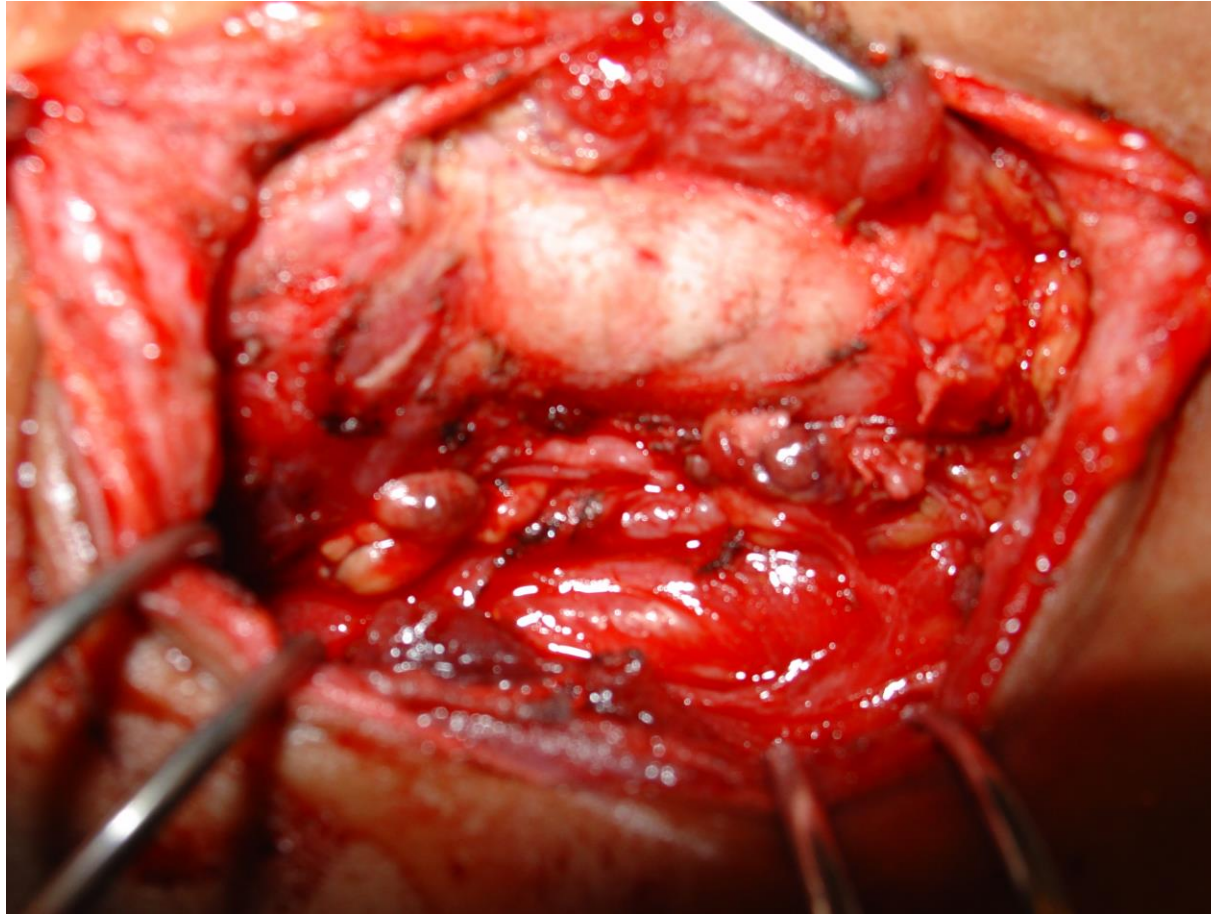
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Medullary Thyroid Cancer - Nodes

- High incidence of nodal metastasis 50- 75% irrespective of tumor size
- Central compartment first echelon of nodal spread in 80%
- Imaging has low sensitivity to identify these nodes because of overlying thyroid (overall false –ve 36% , 32% for central compartment, 14 % for lateral , Kouvaraki et al surgery 2003)
- Surgeons detecting nodes at surgery has limitations sensitivity 64% & specificity 71% (Moley et al)

Medullary Thyroid Cancer – Nodes Central Compartment

Hyoid to innominate
Carotid to carotid



Risk of recurrent nerve damage and parathyroid insufficiency

Medullary Thyroid Cancer

Central Compartment – baseline serum Calcitonin

- <20pg/ml (n<10) – no risk of metastasis
- >20pg/ml – ipsilateral central &lateral nodes
- >50pg/ml - contralateral central
- >200pg/ml – contralateral lateral neck
- > 500 mediastinal nodes

300 consecutive patients (Machane & Dralle Clin Endocrin Meta 2010)

Medullary Thyroid Cancer – Nodes

Central compartment predicting lateral positivity

Ipsilateral lateral

- 10.1% no central nodes
- 77% 1-3 central nodes
- 98% >4 central nodes

Contralateral

- 4.9% no central nodes
- 38% 1-9 central nodes
- 77% >10 central nodes

195 patients, opposite neck positive (185) in all but one with ipsilateral central and lateral node positivity
Machens & Dralle Br J Surgery 2008

Medullary Thyroid Cancer

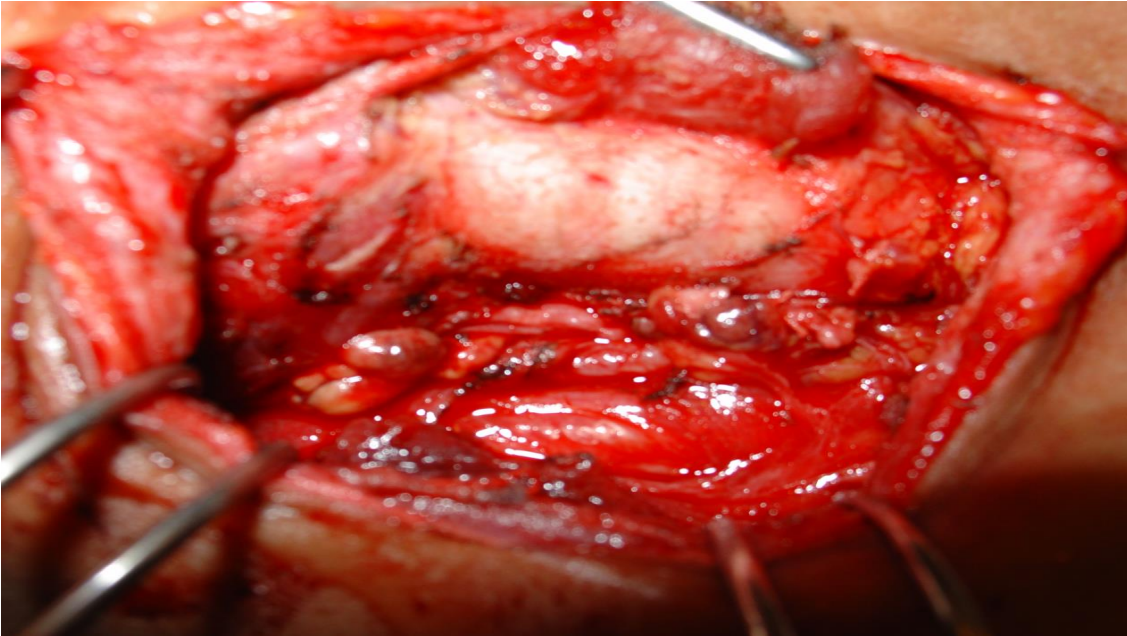
Neck Recommendations

- Ipsilateral central compartment in all patients except those undergoing prophylactic surgery
- Calcitonin , imaging, number of central nodes involved guide extent of rest of neck
- > 20 pg/ml – Ipsilateral Lateral neck
- > 50 pg/ ml – contralateral central
- >200pg/ ml – contralateral lateral neck

Medullary Thyroid Cancer - Surgery

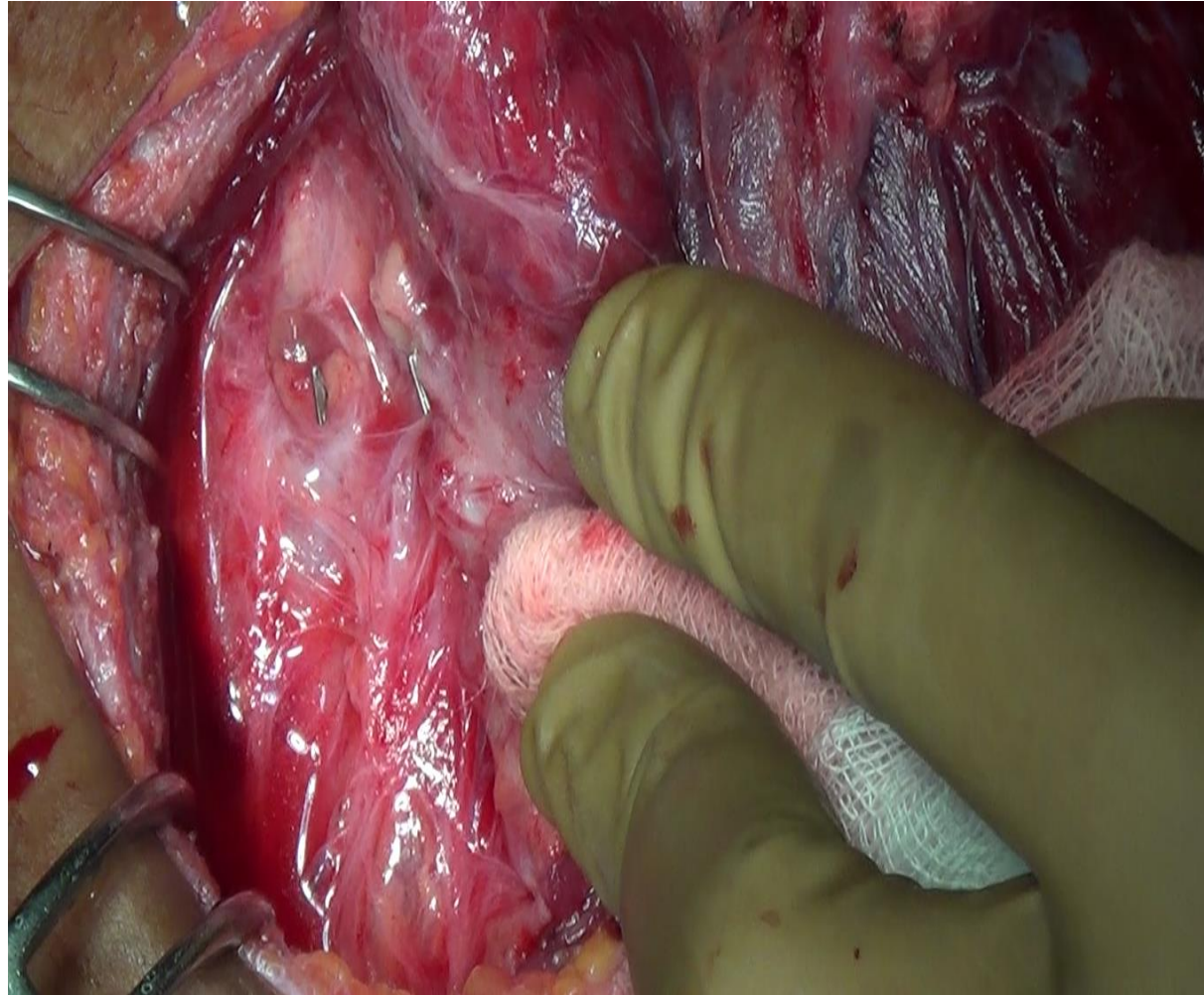
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Parathyroids - Implantation



- Routine implantation not advocated – save on pedicle
- Usually required in cases after extensive dissection
- Mincing and immediate implant have higher success
Sporadic/ MENIIB /mutations not associated with hyperplasia sternomastoid
Otherwise brachioradialis
- Look for parathyroids in specimen

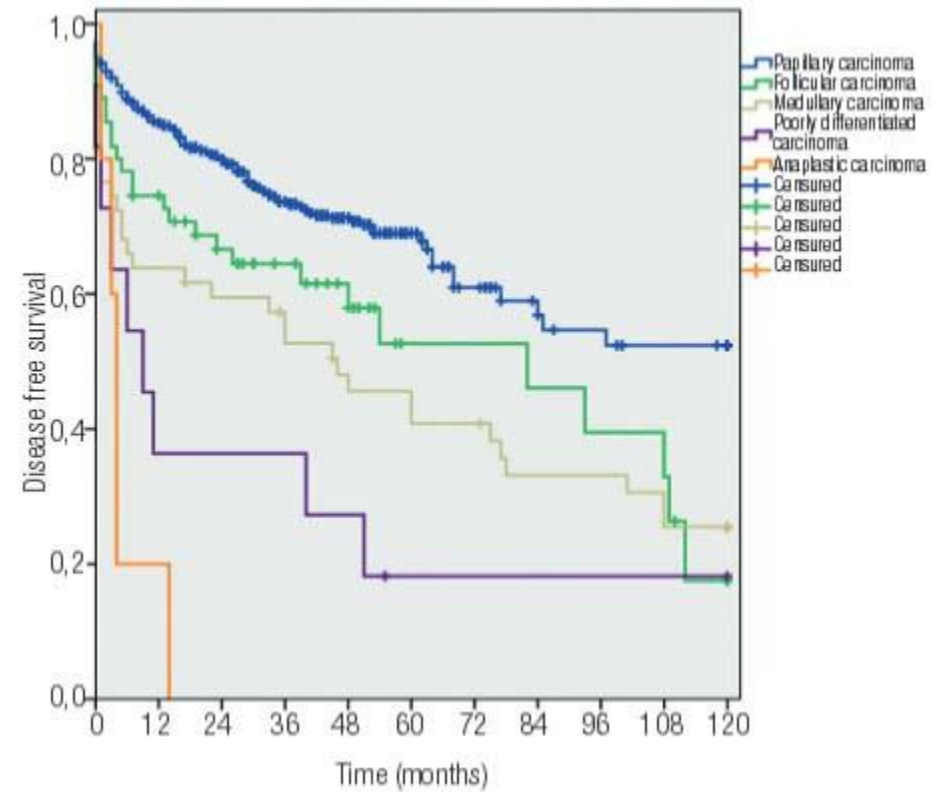
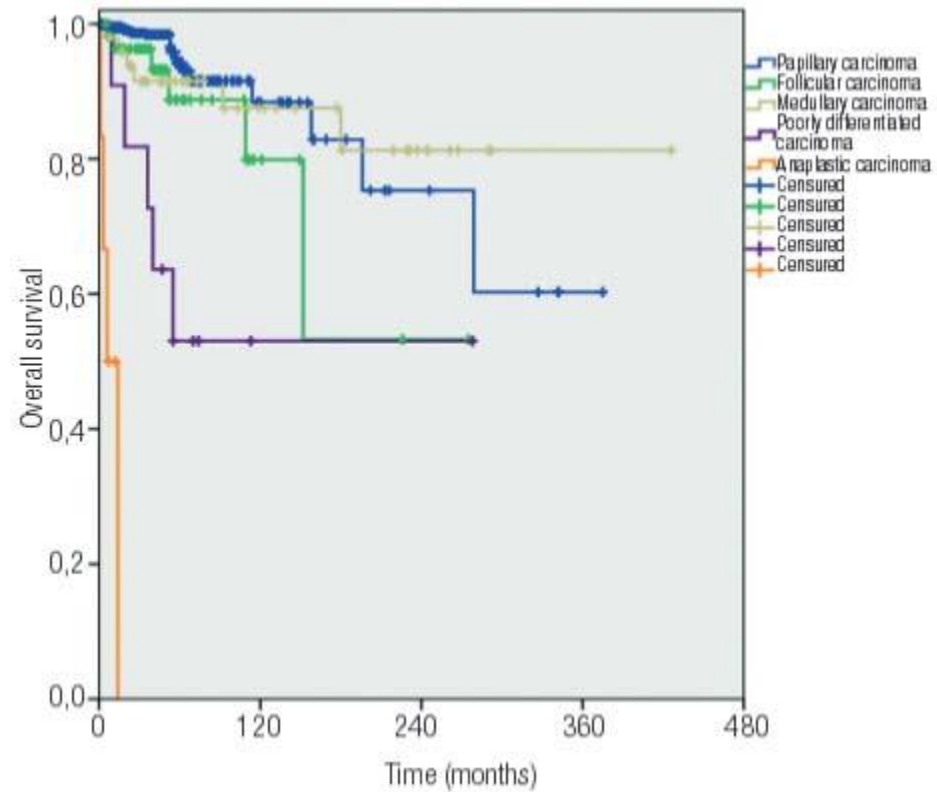
Identification of parathyroids



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Prognosis: between WDTC and ATC



Medullary thyroid Cancers

Locally advanced

- Surgery usually palliative
- Balance QOL vs life expectancy
- Goal- less aggressive surgery with appropriate preservation of speech, swallowing, parathyroid function and shoulder mobility
- Supplement with radiotherapy, medical and other non surgical therapy

Treatment in these cases is individualized

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GREY TURNER LECTURE—DURBAN, SOUTH AFRICA

The Role of Prophylactic Surgery in Cancer Prevention

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Criteria

Medullary Thyroid Cancer & RET proto-oncogene

1. The mutation must have a very high penetrance and express regardless of environmental factors

RET is a proto-oncogene
Single point mutation results in malignancy
An autosomal dominant inheritance
>95% penetrance of MTC
25% MTC are hereditary

2. There must be a highly reliable test to identify patients who have inherited the mutated gene

Genetic testing identifies individuals before clinical, biochemical or radiological manifestations
Known mutations encode more than 95% of hereditary MTC
Low rates of false positive & false negative

3. The organ must be removed with minimal morbidity and virtually no mortality

Prophylactic total thyroidectomy can be performed with minimum morbidity, less psychological effect and virtually no mortality
No significant long term impact on quality of life

4. There must be a suitable replacement for the function of the removed organ

Post-operative thyroid hormone replacement is available

5. There must be a reliable method of determining over time that the patient has been cured by prophylactic surgery

Serum calcitonin levels can be used to follow-up patients longitudinally for recurrences along with USG neck, CT scan & PET-CT scan

ATA 2009 Risk level & timing

Balance the risk of clinical significant disease with the risk of operative intervention

American Thyroid Association Risk level & Prophylactic thyroidectomy testing and therapy				
ATA risk level	Age of RET Testing	Age of requiring first USG	Age of requiring first serum Calcitonin	Age of prophylactic surgery
D	ASAP & within the 1 st yr. of life	ASAP & within the 1 st yr. of life	6 mths if surgery not already done	ASAP & within the 1 st yrs of life before age 5yrs.
C	<3-5yrs	<3-5yrs	<3-5yrs	Before age 5
B	<3-5yrs	<3-5yrs	<3-5yrs	May delay surgery beyond age 5 yrs if stringent criteria are met
A	<3-5yrs	<3-5yrs	<3-5yrs	May delay surgery beyond age 5 yrs if stringent criteria are met
A normal annual basal-+ stimulated serum Calcitonin , normal annual neck USG ,less aggressive MTC family history and family preference ASAP –as soon as possible				

Age of onset varies between families and also within families with same mutation

Risk reducing surgery

ATA Risk level	Previous ATA level	Screening for MTC	Codon	Age of RRSX	Extent of CCC
Highest risk (HST)	D	Soon after the birth	M918T	ASAP & within 1 st year of life	Depends on identification of parathyroid, Age >1yr, USG
High risk(H)	C	3 yrs	C634 A883F	Before 5 yrs	S.Ctn >40 pg/ml, USG N
Moderate risk(MOD)	A, B	5 yrs	Rest	May be delayed beyond 5 yrs	S.Ctn >40 pg/ml, USG N

Age of onset varies between families and also within families with same mutations

Medullary Thyroid Cancer - Conclusions

- Surgery on the thyroid – total in majority
- Neck – Central and Lateral – directed by imaging, number of nodes and calcitonin
- Parathyroids- save on a pedicle , implant when needed
- Locally advanced cancers – balance with QOL and expectancy
- Hereditary/ Prophylactic - age stratified approach

Thank You