

# 개원의가 알아야 할 갑상선 질환의 진단과 치료

김 용 현

Endocrinology, Bundang JS. Hosp

?

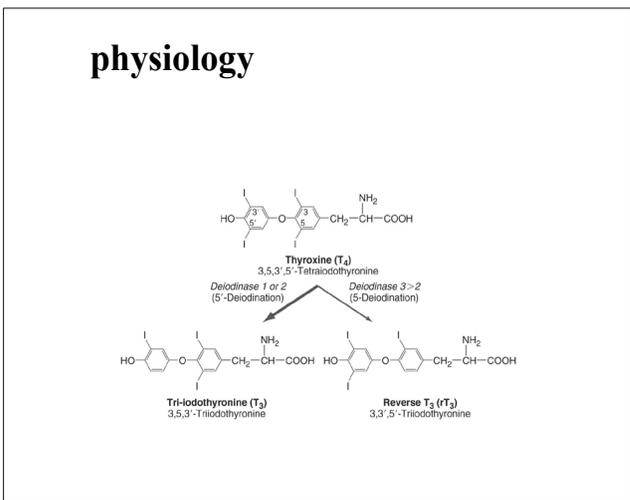
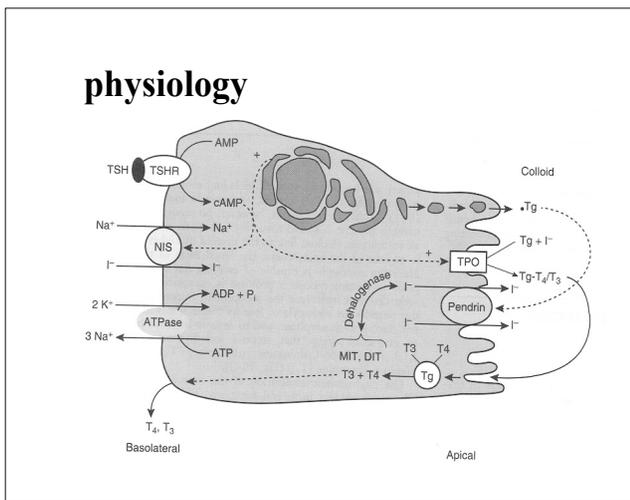
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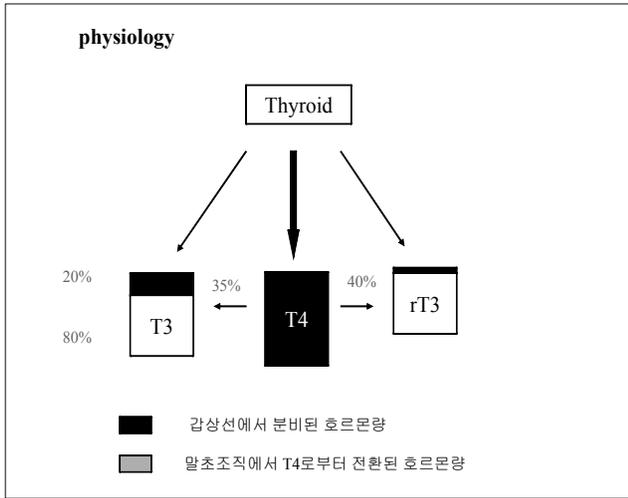
2 (lobe) (isthmus)

(Lobe): 4-5cm  
1.5-2cm  
: 2-3cm  
: 15-20g

## Physiology

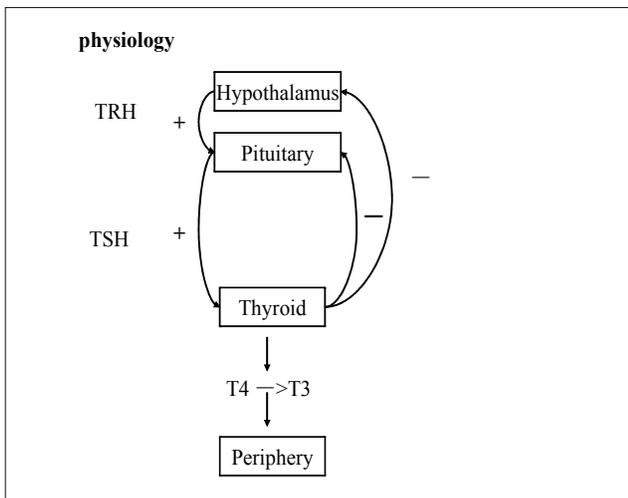
- 1) Oxidation
- 2) Organification
- 3) Coupling
- 4) Storage and Release





### Euthyroid sick syndrome

- 71 가 ,
- lab : Hg 9.0 Na 131 K 3.4  
TFT  
FT4 0.95 (0.93-1.7) T3 0.65 (0.8-2.0) TSH 0.68 (0.27-4.2)



TSH

High	Primary hypothyroidism	?	TSH producing pituitary tumor or Thyroid Hormone Resistance
Normal	?	Normal Range	?
Low	Secondary hypothyroidism	?	Primary Hyperthyroidism
	Low	Normal	High

Free T4

(thyrotoxicosis)

갑상선중독증  
(Graves' disease)

### 증상

1. , ,
- 2.
3. 가
4. ,
- 5.
- 6.
7. 가
- 8.

### 진찰소견

1. 가,
- 2.
- 3.
4. ,
5. ( )

### 검사 소견

TFT : fT<sub>4</sub>, T<sub>3</sub>  
 TSH ( )  
 : AST/ALT  
 :

#### ■ (Graves' disease)

- 60-80%
- : = 10:1 (3-8:1)
- ( ): 2%

### 치료

#### 1) 약물 요법

항갑상선 약제 (Thionamides)  
 (안티로이드, 메티마졸)

재발을 잘하는 특징 ->

처음에는 상승한 혈중 수치가 정상까지  
 떨어지도록 많은 양을 복용 (6-8T/day)

-> 혈중 수치가 정상으로 떨어지면 조금씩 줄여나감

-> 최저 용량까지 감량하여 정상 호르몬 수치까지  
 조절되면 약 중단할 수도

-> 총 1-2 년 정도 치료 기간 요함

부작용  
 피부 allergy  
 agranulocytosis -> 심한 열

- 2)
- 3)

• 급성 갑상선 중독증

심한열, 구토, 의식저하, 경련, 혼수상태까지

→ 사망에 까지 : 심장기능저하,  
심한 고열로 인해

, Hypothyroidism

1. , Primary Hypothyroidism (>95%)

가 : Hashimoto's T(>80%), atrophic T  
(Iatrogenic) : Surgery, RAI  
: Lithium, PTU, Amiodarone

(Iodine deficiency)  
(Infiltrative disorder) : amyloidosis, sarcoidosis

2. (Transient)

Subacute thyroiditis :

- 1) painful (granulomatous)
- 2) painless (lymphocytic) - postpartum thyroiditis

3. (Secondary)

hypopituitarism  
hypothalamic disease (tumors, trauma, infiltrative)

1.

- 1. Tiredness, weakness
- 2. Dry skin
- 3. Feeling cold
- 4. Constipation
- 5. Weight gain with poor appetite

2.

- 1. Dry, coarse skin
- 2. Puffy face, hands, feet

▪

Levothyroxine (synthroid 100ug, 50ug, 150ug)  
1.6ug/kg  
/  
: 12.5-25ug start

▪ L-thyroxine

- 
- 
- 
- :  
:cholestyramine, Al. hydroxide  
:dilatol, RFP, phenobarbital

## Thyroiditis

### Causes of Thyroiditis

#### Acute

Infection (Bacterial, Fungal infection)

Radiation thyroiditis

Amiodarone

#### Subacute

Viral (granulomatous) thyroiditis

Silent thyroiditis

#### Chronic - autoimmune

## 아급성 갑상선염 (subacute thyroiditis)

- 항진증의 10-20%

갑상선 중독증의 염증에 의한 갑상선의 파괴로

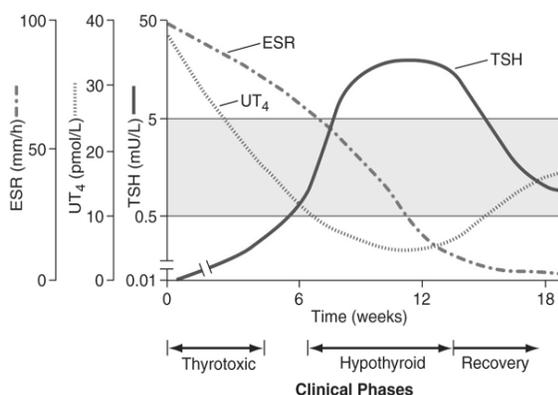
인해 갑상선에 저장되어 있던 갑상선호르몬이

갑자기 분비 → 항진증 증상

- 그레이브병에 비해 홀몬 상승의 정도가 심하지 않다

- 치료 약도 면역 반응을 억제하는 약을 처방

- 대체로 3-4 개월 내에 호전되는 짧은 경과



## Thyroid nodule

- Incidence of palpable thyroid nodule : About 5%
- In case of palpable nodule, most of size of nodule is above 1cm
- Increased detection rate by **thyroid sono**, especially in Korea
- Increased rate in iodine deficient area, female, increasing age
- Check TSH -> if suppressed -> thyroid scan -> if hot nodule -> no FNA

## Incidental thyroid nodule

- By thyroid sono or other radiologic exam.
- **Same malignancy rate with palpable nodule**
- In case of above 1cm -> proceed FNA because of risk of malignancy, clinically

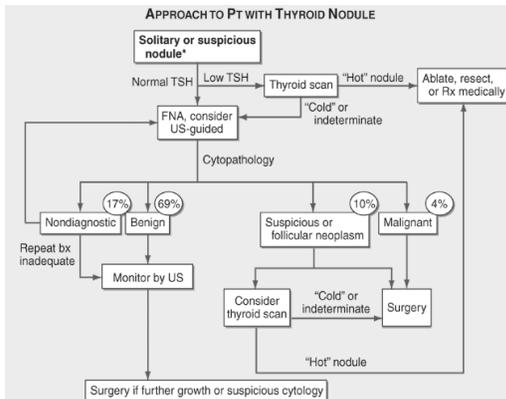
- But, in case of
  - 1) Sono finding of represent malignancy :
    - taller than wide,
    - speculated, irregular margin
    - marked hypoechogenicity (increased vascularity)
    - micro- or macro-calcification in nodule
  - 2) History of head and neck radiation
  - 3) Family history of thyroid cancer
    - \* need FNA in spite of below 1 cm

## FNAC

- Most accurate and cost efficient
- Results :
  - 1) non-diagnostic -> Repeated non-diagnostic and combined cystic change -> close f/u or consider surgery
  - 2) malignancy -> surgery
  - 3) **indeterminate**(Suspicious, follicular lesion, follicular neoplasm) : 15% -> consider surgery for confirmation
  - 4) benign
- About 5% of false negative -> f/u is necessary -> if increase in size -> indication of repeated FNA

## THS suppression therapy

- Considered in iodine deficiency area
- Not recommended generally



## Thyroid cancer

- Most common endocrine malignancy
- Increasing with aging -> peak after 50 yrs
- More than 2 times in female

### Thyroid neoplasm

Category	Approximate Prevalence
<b>Benign</b>	
Follicular epithelial cell adenomas	
Macrofollicular (colloid)	
Normofollicular (simple)	
Microfollicular (fetal)	
Trabecular (embryonal)	
Hürtle cell variant (oncocytic)	
<b>Malignant</b>	
<b>Follicular epithelial cell</b>	
Well-differentiated carcinomas	
Papillary carcinomas (80-90%)	
Pure papillary	
Follicular variant	
Diffuse sclerosing variant	
Tall cell, columnar cell variants	
Follicular carcinomas (5-10%)	
Minimally invasive	
Widely invasive	
Hürtle cell carcinoma (oncocytic)	
Insular carcinoma	
Undifferentiated (anaplastic) carcinomas	
<b>C cell (calcitonin-producing)</b>	
Medullary thyroid cancer (10%)	
Sporadic	
Familial (MEN 2)	
<b>Other malignancies</b>	
Lymphomas (1-3%)	
Sarcomas	
Metastases	
Others	

## Unique features of thyroid ca.

→ good prognosis

- Easy diagnosis by FNAC
- Remnant ablation by <sup>131</sup>Iodine -> easy diagnosis of remnant thyroid tissue and distant mets. during fu.
- Serum markers
  - thyroglobulin(Tg) for PTC and FTC
  - calcitonin for MTC

## Staging of Thyroid cancer

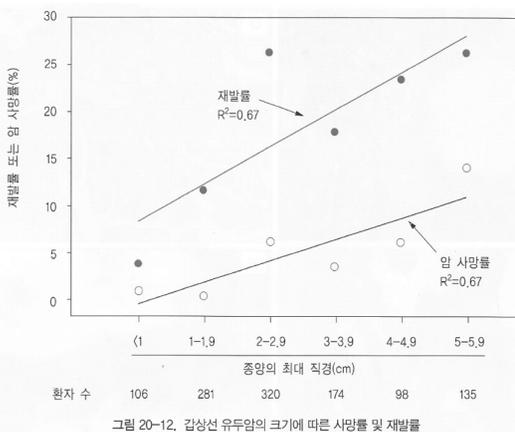
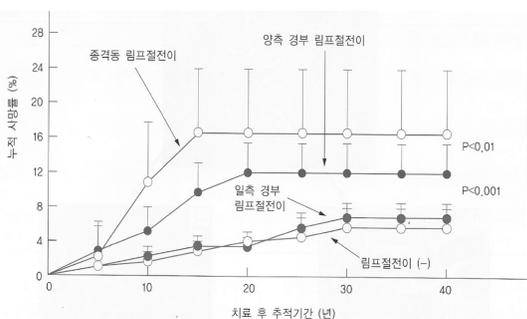
<b>Papillary or follicular thyroid cancers</b>		
	<45 years	>45 years
Stage I	Any T, any N, M0	T1, N0, M0
Stage II	Any T, any N, M1	T2 or T3, N0, M0
Stage III	—	T4, N0, M0
Stage IV	—	Any T, N1, M0
		Any T, any N, M1
<b>Anaplastic thyroid cancer</b>		
Stage IV	All cases are stage IV	
<b>Medullary thyroid cancer</b>		
Stage I	T1, N0, M0	
Stage II	T2-T4, N0, M0	
Stage III	Any T, N1, M0	
Stage IV	Any T, any N, M1	

<sup>a</sup>Criteria include: T, the size and extent of the primary tumor (T1 ≤ 1 cm; 1 cm < T2 ≤ 4 cm; T3 > 4 cm; T4 direct invasion through the thyroid capsule); N, the absence (N0) or presence (N1) of regional node involvement; M, the absence (M0) or presence (M1) of metastases.

**Source:** American Joint Committee on Cancer staging system for thyroid cancers using the TNM classification.

## Papillary thyroid ca.

- 70-90% of thyroid ca.
- Microscopic PTC in 25% of autopsy
- psammoma body (large nucleoli "orphan-Annie" appearance 가 cleaved nuclei)
- papillary structure
- Tends to multifocal, invade to thyroid capsule and adjacent structure
- Propensity to lymphatic spread, but can to lung and bone via hematogenously



## Follicular thyroid ca.

- More common in iodine deficient area
- Difficult in D/D between benign and malignant : invasion to vessel, nerve and adjacent structure
- Tends to hematogenous spread : bone, lung, CNS
- Less favorable in mortality than PTC
- Poor Px. : distant metastasis, age over 50, tumor size >4cm, marked vascular invasion

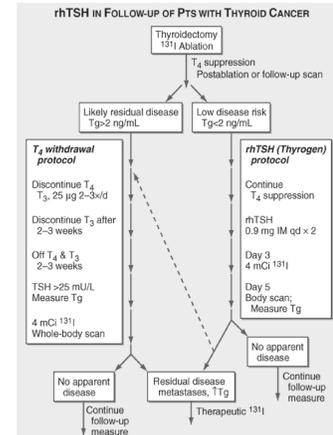
## Treatment : Op

- Surgical excision : accurate histologic dx. and staging, find multicentric disease in contralateral lobe, LN assessment and removal
- For stage I : lobectomy v/s near-total thyroidectomy
- Completion thyroidectomy : in 20% of follicular neoplasm -> malignant at final pathologic dx.
- S/E : hypoparathyroidism, recurrent laryngeal nerve palsy

### Treatment : radioiodine

- Aim : eliminate remaining normal thyroid tissue and treat residual tumor cells
- Controversy in low risk group such as stage 1 PTC with size < 1-2 cm
- Generally indicated in larger PTC, spread to the LN, FTC, evidence of metastasis
- : , , , xerostomia,

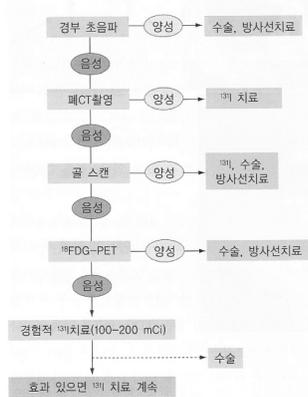
f/u  
whole body  
scanning &  
Tg



### Scan-negative , Tg-positive

- 가 <sup>131</sup>I
- Tg
- TSH <sup>131</sup>I
- <sup>131</sup>I

<sup>131</sup>I 전신스캔 음성/혈청 Tg 양성인 경우의 관리



### Neck sono

6-12 months after iodine ablation  
-> every year up to 5 years

### TSH suppression

TSH receptor on cell membrane of PTC & FTC  
-> TSH is most powerful growth factor of differentiated thyroid ca.

표 20-29. 갑상선 분획암의 일차 치료 후 TSH 억제 정도의 기준

환자군	혈청 TSH (uU/ml) 기준		
	미국갑상선학회	유럽갑상선학회	영국갑상선학회
암이 지속되는 경우 (Tg 측정되는 예 포함)	<0.1	<0.1	<0.1
질환 없는 고위험군	5~10년간 0.1~0.5	3~5년간 <0.1	<0.1
질환 없는 저위험군	0.3~2.0	0.5~1.0	0.1~0.5

## MTC

- Sporadic or familial(more aggressive)
- 3 familial forms
  - 1.MEN 2A
  - 2.MEN 2B : more aggressive than 2A
  - 3.Familial MTC without other features of MEN
- Calcitonin : marker of residual or recurrent dz.
- Test RET mutation
- treatment : primarily surgical  
don't take up radioiodine  
RT or CT for palliation in advanced dz.