

Aspek Kedokteran Nuklir Pada Kelainan Kelenjar Tiroid

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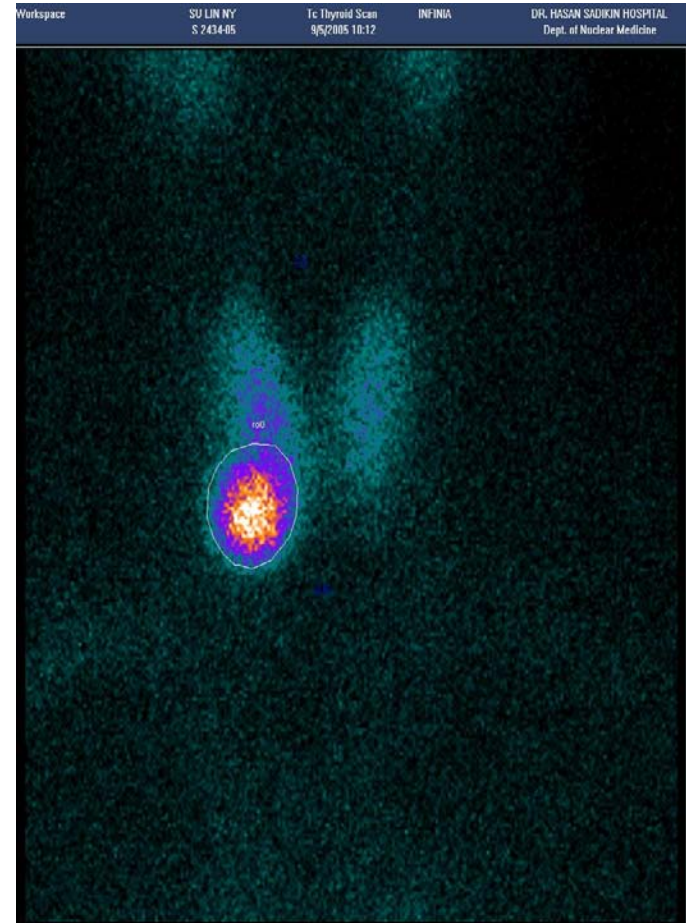
Kedokteran Nuklir Pada Tiroidologi

Sebagai Diagnostik

- * Uptake
 - High uptake : Hipertiroidi
 - Low uptake : Hipotiroidi
- * Nodul : hangat, panas dan dingin
- * Mediastinal goiter
- * Deteksi metastasis kanker tiroid
- Evaluasi terapi

Sebagai terapi

- ▶ Hyperthyroidism
- ▶ Differentiated Thyroid Carcinoma
- ▶ Multinodular goiter



Two Common Types of Thyroid Disease



▶ Hyperthyroidism

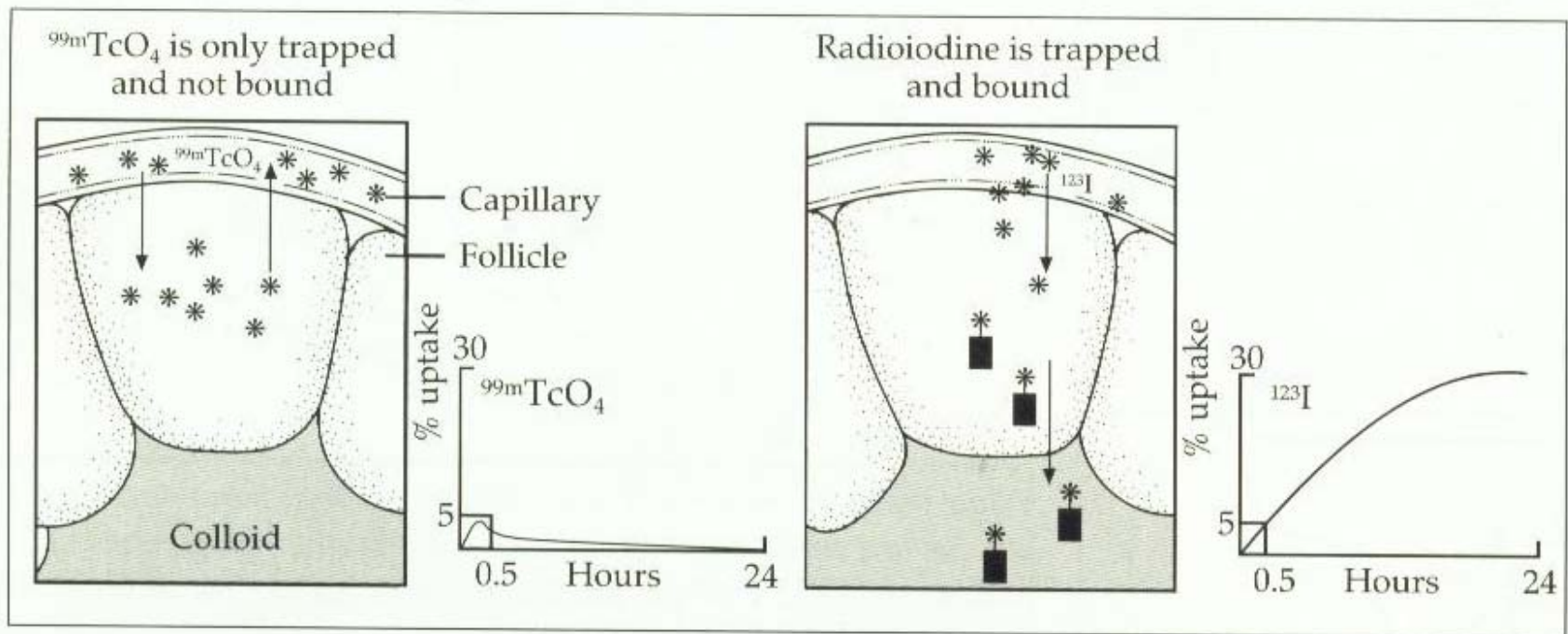


▶ Hypothyroidism

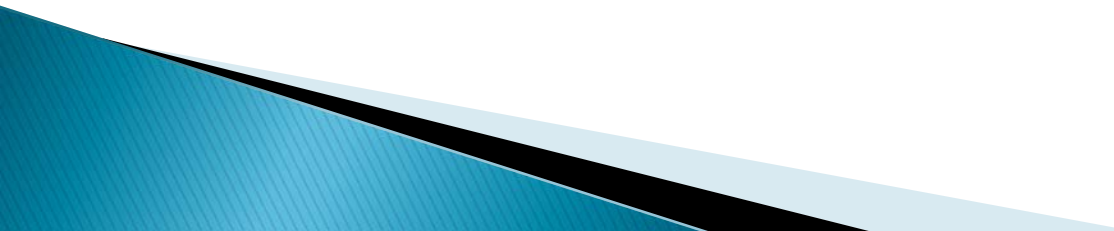
Prinsip Dasar Sidik tiroid/ thyroid scan :

Alternatif radiofarmaka yang digunakan :

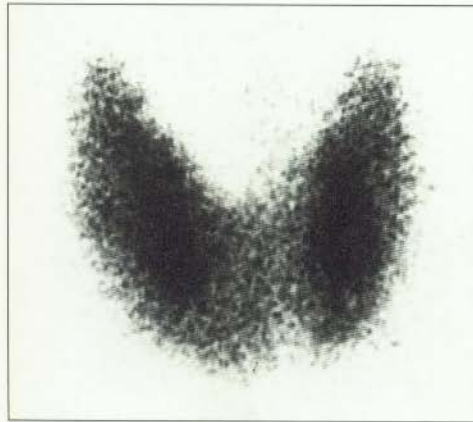
- ▶ Tc-99m pertechnetate : ditangkap oleh sel tiroid.
- ▶ I-131, I-123 : akan ditangkap dan ikut organifikasi dalam sel tiroid



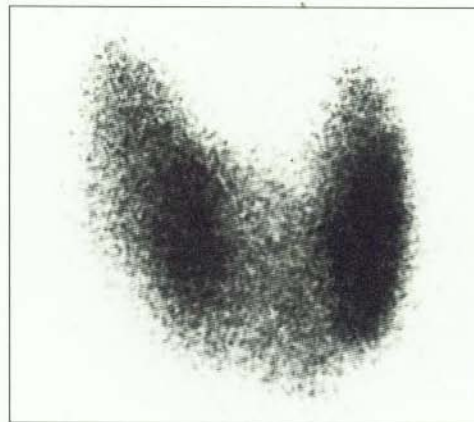
Indikasi Klinis Sidik Tiroid/Tiroid Scan

- Menilai nodul tiroid:hangat, panas,dingin.
 - Diagnosis penyebab tirotoksikosis
 - Menilai pembesaran goiter
 - Evaluasi ektopik tiroid
 - Penilaian pada tata laksana kanker tiroid
- 

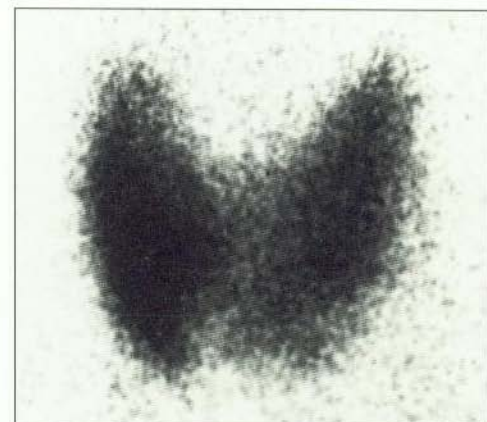
2.3.1 Normal thyroid scan



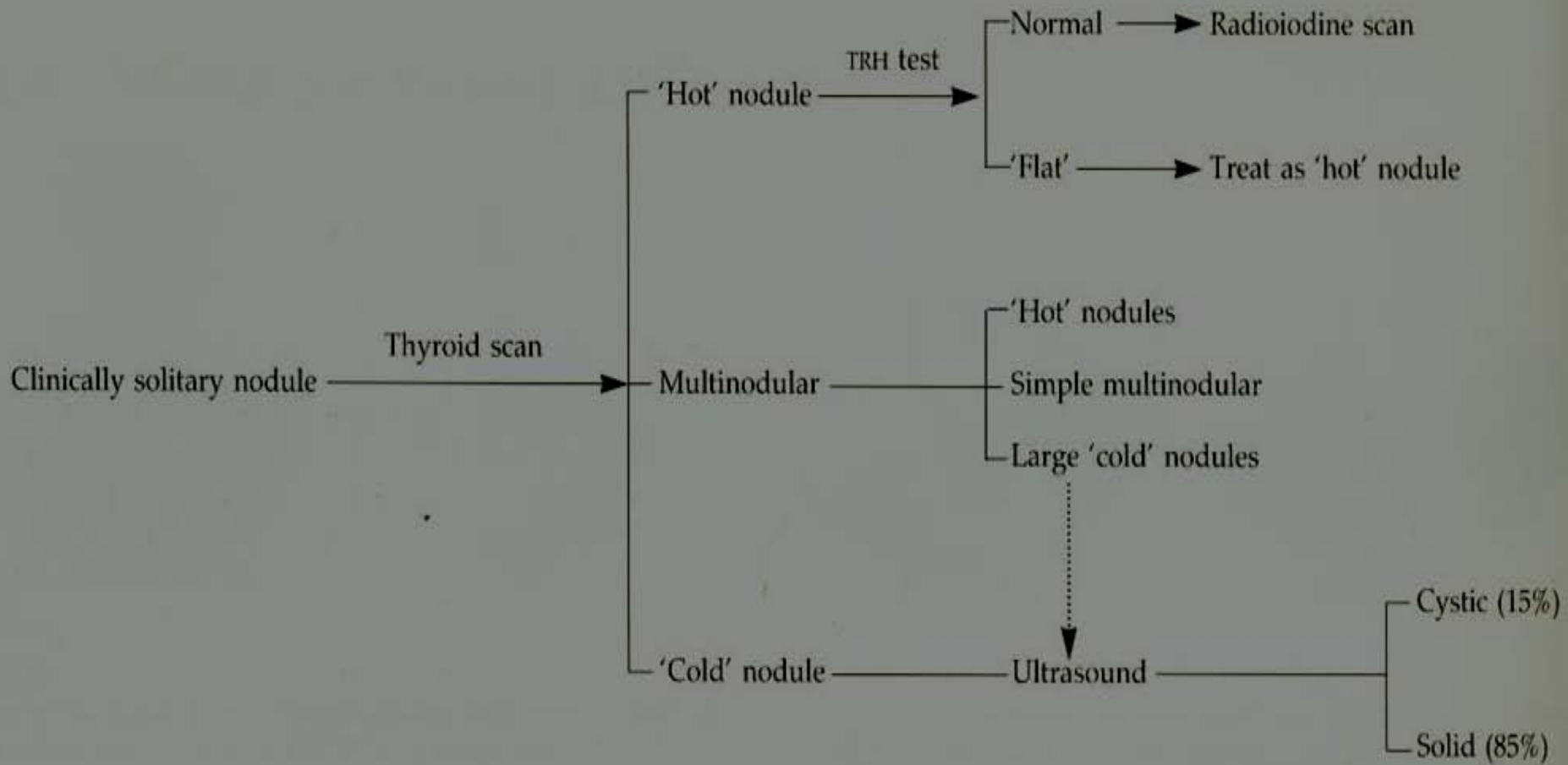
a Anterior

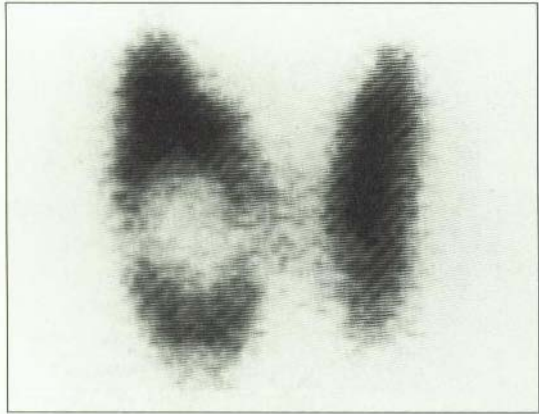


b Left anterior oblique

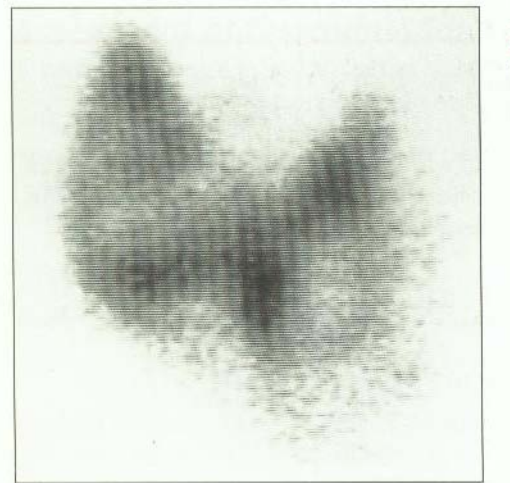


c Right anterior oblique



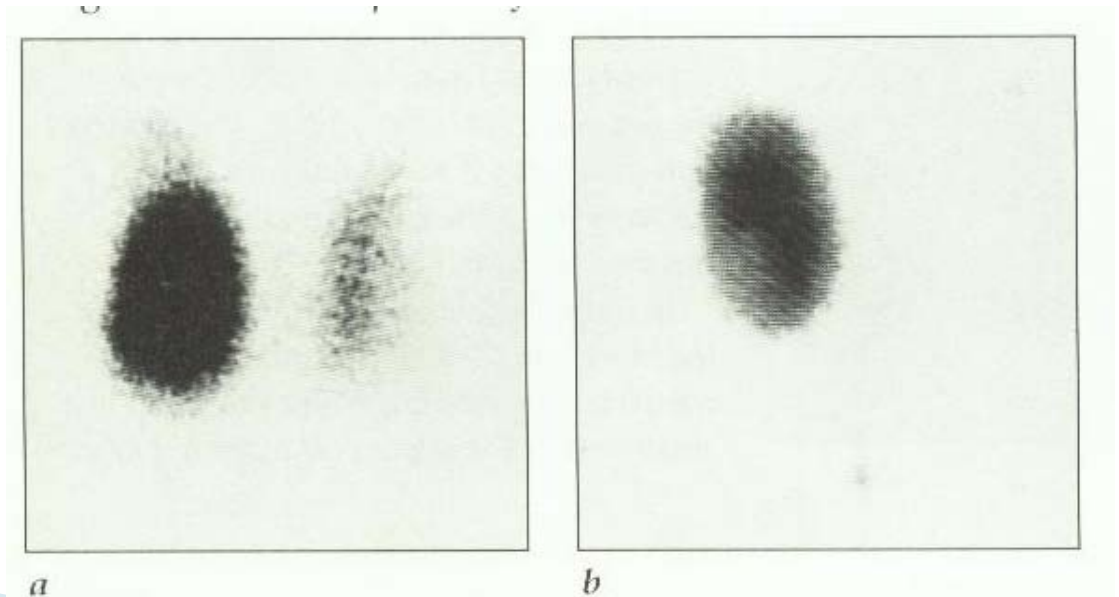


a Before



Non functioning /
cold nodule

Functioning /
warm or hot
nodule



Nodule of Thyroid in NM perspective

Non functioning
nodule /

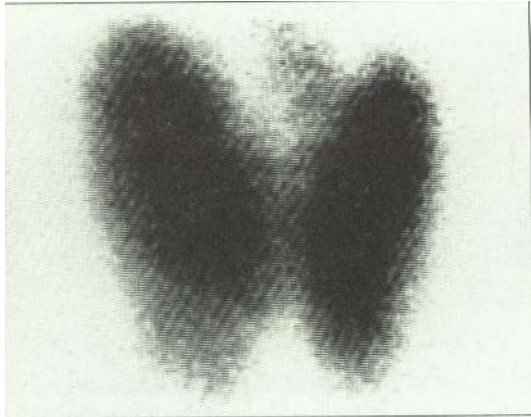
Cold nodule :

- ▶ Benign :
 - Cyst
 - Colloid
 - Non functioning adenoma
 - Thyroiditis
- ▶ Malignant

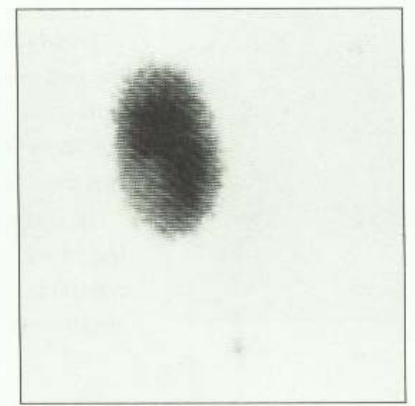
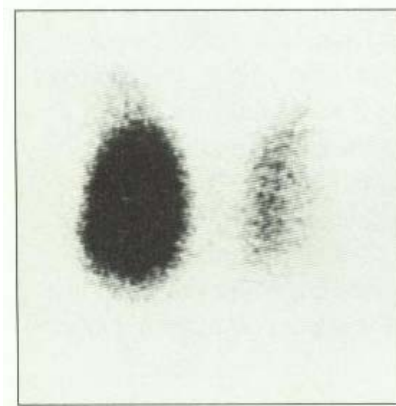
Functioning nodule /
Warm or Hot nodule :

- ▶ Benign :
 - Graves disease
 - Nodule thyroid autonomous (NTO)
 - Functioning adenoma

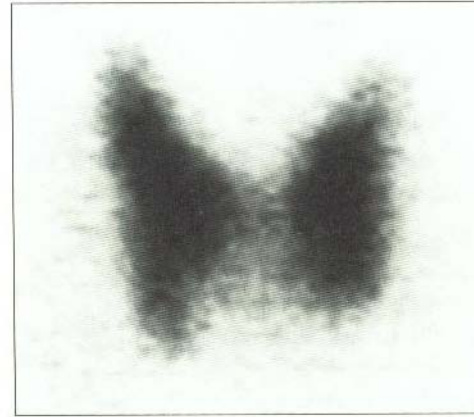
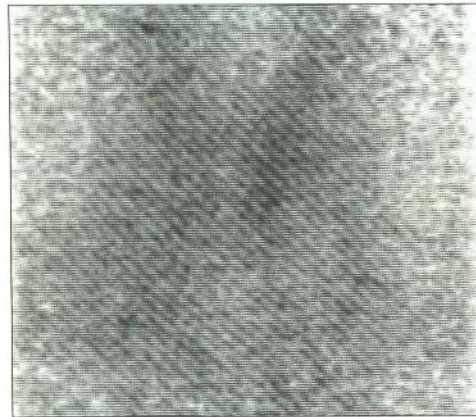
Diagnosis of cause of thyrotoxicosis



Graves disease in both lobe with app. of lobus pyramidalis

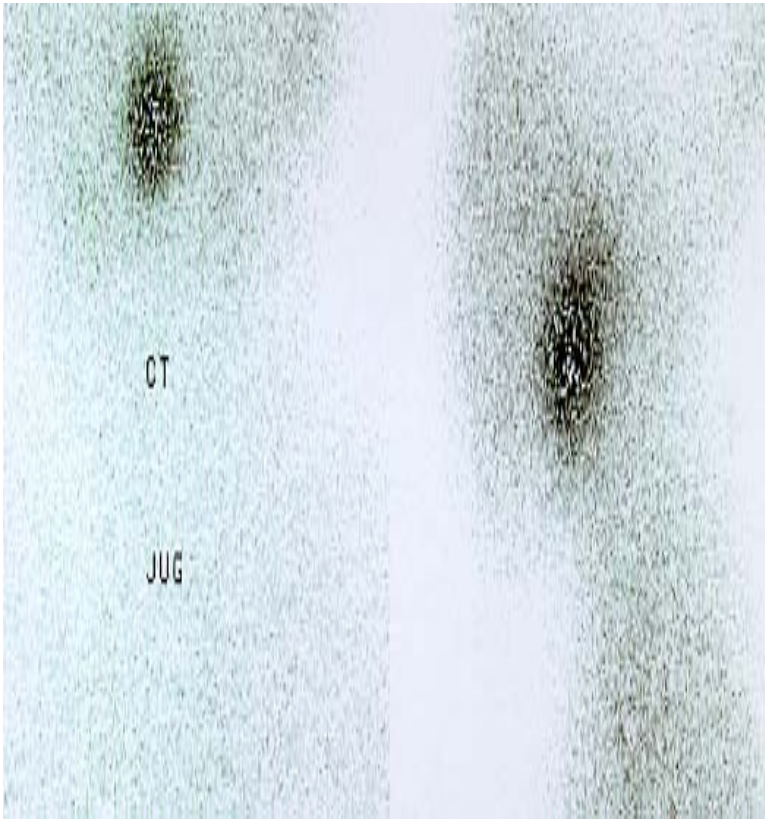


^a Graves disease in the right lobe (left fig.)
^b and NTO (right fig.)

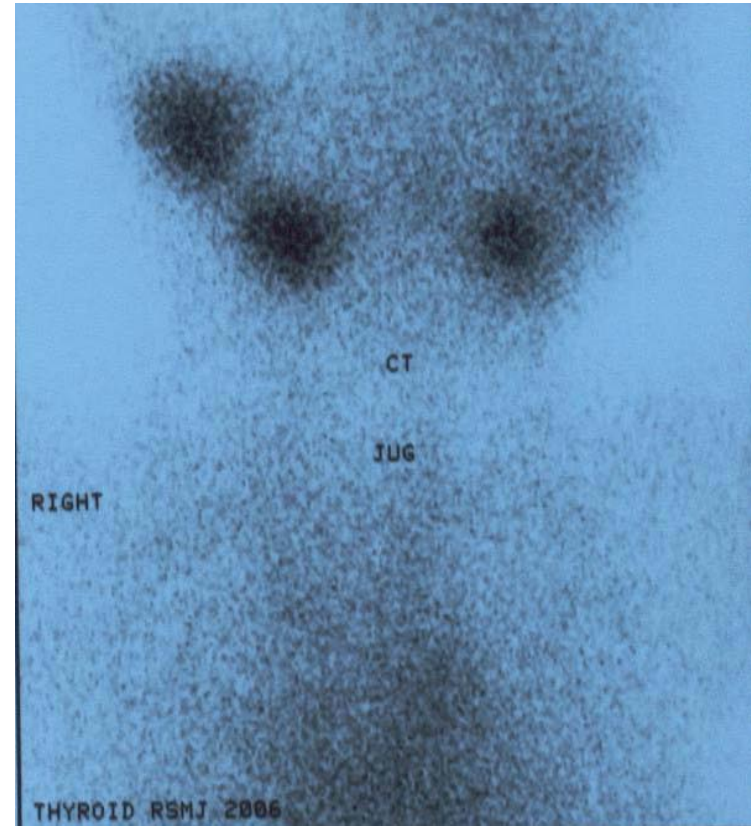


Thyroiditis at the time of diagnosis (left fig.)
and 4 mo later (right fig.)

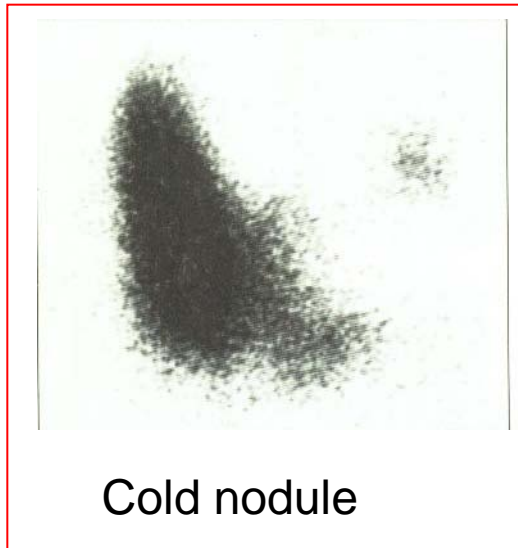
- Evaluation of ectopic thyroid tissue



- Detection of thyroid agenesis



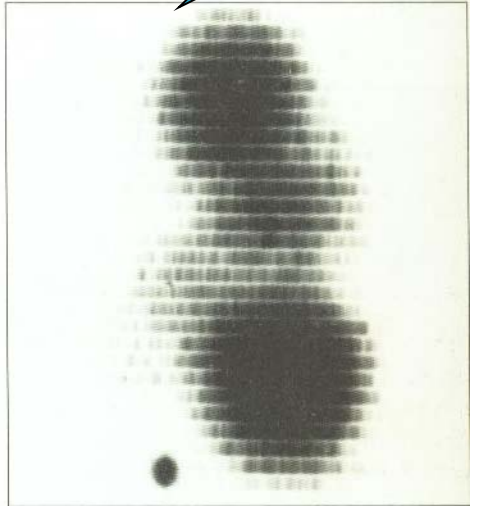
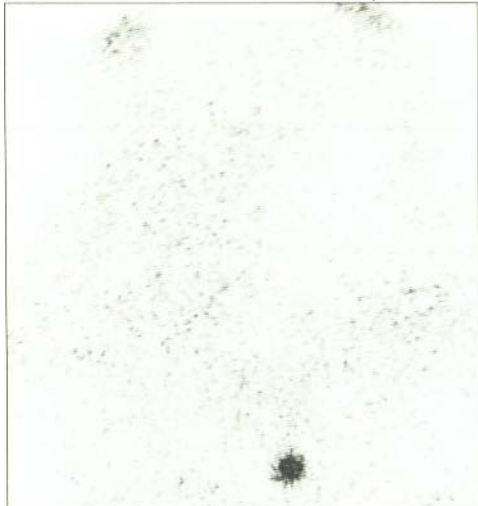
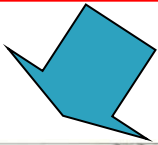
Thyroid Cancer



FNAB → Cancer

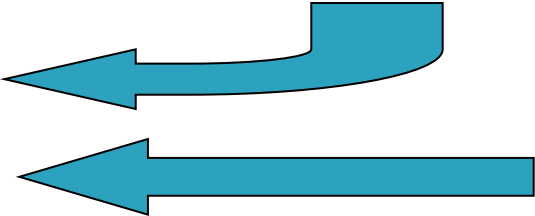


Total Thyroidectomy



No residual of thyroid tissue (right), with residual thyroid / cancer tissue (left)

Follow up



Radiothyroablation with NaI-131



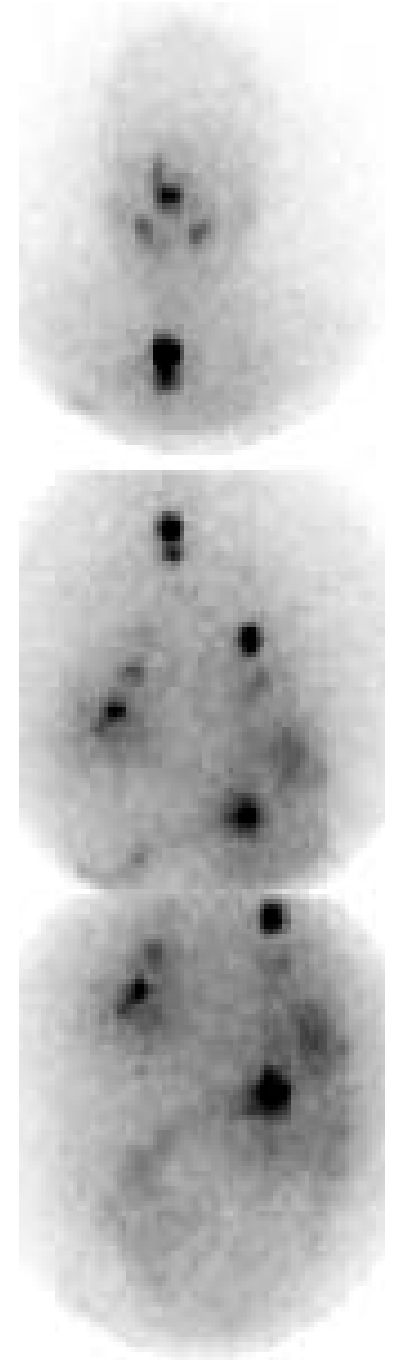
Terapi

- ▶ 1. Hipertirodi
- ▶ 2. Kanker Tiroid

- ▶ Hipertiroidi
 - Radioisotop : Iodium 131
 - Diberikan per-oral
 - Waktu paruh 8 hari
 - Sifat : memancarkan radiasi beta dan gamma
 - Tujuan : eutiroid
 - Mengablasi sel-sel folikel tiroid sehingga produksi hormon tiroid yang berlebihan dihentikan
 - Efek baru akan tampak setelah 8-12 minggu
 - Munculnya efek yang diharapkan dipengaruhi oleh dosis
 - Dapat menimbulkan hipotiroidi setelah pengobatan → hormon tiroid

Kanker Tiroid

- Kanker tiroid berdifferentiasi baik
- Radioisotop : Iodium 131
- Diberikan per-oral
- Kombinasi dengan terapi hormon tiroid
- Pasca total tiroidektomi (5-6 minggu)
- Bertujuan mengablasi jaringan tiroid yang tersisa (mikro)
- Terapi dapat diulang setelah 4-6 bulan (tergantung hasil kontrol kadar tiroglobulin, sidik seluruh tubuh)
- Maksimal jumlah dosis 1 curie
- Tiroglobulin tetap tinggi, jaringan sisa menentang di lapang tiroid → radioresisten
- Radioresisten dilanjutkan dengan radiasi eksterna



Kontra indikasi terapi I-131

- ▶ Thyrotoxicosis factitia
- ▶ Subacute thyroiditis
- ▶ Silent thyroiditis (atypical ,subacute, lymphocytic, transient, postpartum)
- ▶ Struma ovarii
- ▶ Thyroid hormone resistance
- ▶ Secondary hyperthyroidism
- ▶ Thyrotoxicosis associated with Hashimoto's disease (hashitoxicosis)
- ▶ Jod-Basedow phenomenon (iodine-induced hyperthyroidism)



Terima Kasih