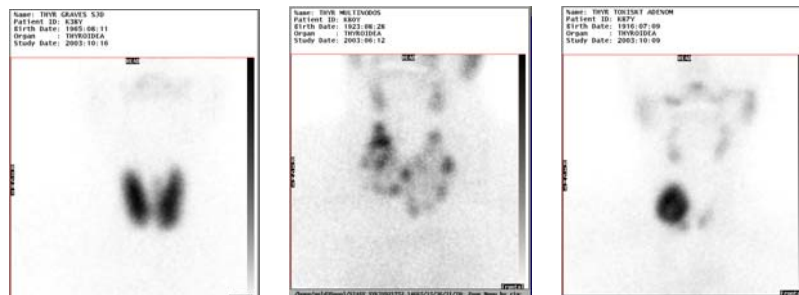


Radioactive Iodine (I-131) for thyrotoxicosis preparation, treatment and outcome

Kirsten Björnlinger, Anders Jönsson
Sven-Åke Starck

A retrospective study Iodine-131 treatments in 2011

- 71 patients (58 female and 13 male)
- 38 Graves disease
- 26 Multinodular goitre (4 excluded)
- 7 Toxic adenoma (one excluded)



Prescribed doses

- 120 Gy for Graves disease
- 150 Gy for multinodular goitre
- 300 Gy for toxic adenoma

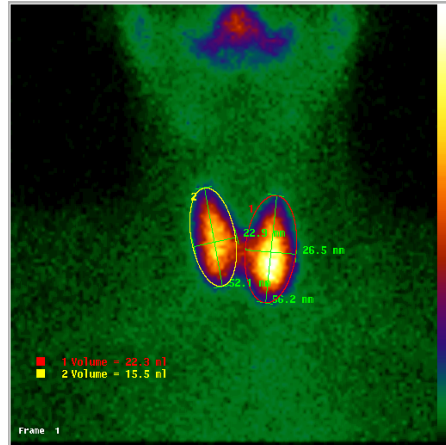
Determination of thyroid volume

- Planar thyroid scintigraphy
- 110 MBq Tc-99m pertechnetate
- rotational ellipsoids (long and short axis, threshold \approx LT10)

Determination of thyroid volume

Volume: rotational ellipsoids:

$$V = (4/3)\pi L S^2$$



Measurement of thyroid uptake and calculation of administered activity

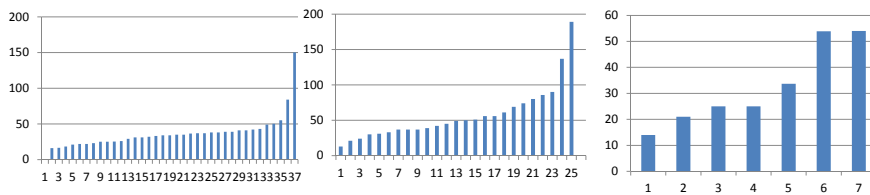
- After 5 days on a given activity of 0.3 MBq
- The given activity was calculated, using the uptake value and thyroid volume, for the prescribed doses according to H. Jönsson

$$D/A = 0.043 * U_0 T_{eff} / V \quad U_0 T_{eff} = k_t U_t$$

$$D/A = 0.043 * 6.76 * U_t / V$$

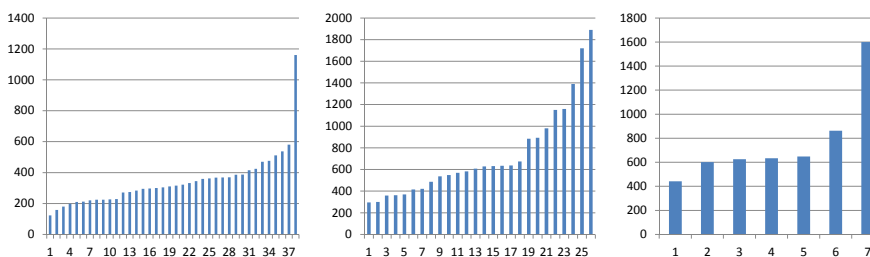
Results (volume ml)

	Mean	Median	Min	max
Graves	37.6	34,5	16	150
Multinodular goitre	57,5	49	13	189
Toxic adenoma	33,6	25	14	54



Results (given activity MBq)

	Mean	Median	Min	max
Graves	343	313	123	1160
Multinodular goitre	754	618	296	1890
Toxic adenoma	802	633	442	1600



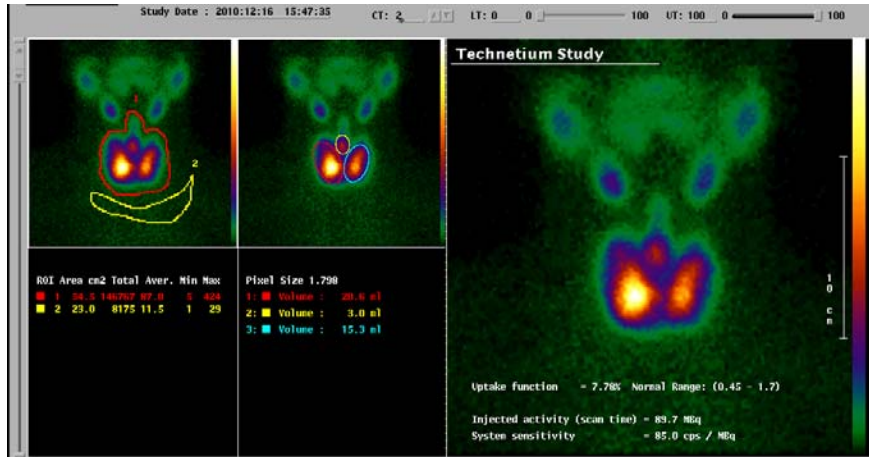
Results; euthyroid status

- toxic adenoma: 5 of 6 patients (83%)
- multinodular goitre: 22 of 25 patients (88%)
- Graves disease: 2 of 38 patients (5%)

- Second treatments
3 multinodular goitre, 4 graves
- Rest of patients; hypothyroid status
thyroid replacement therapy was inserted

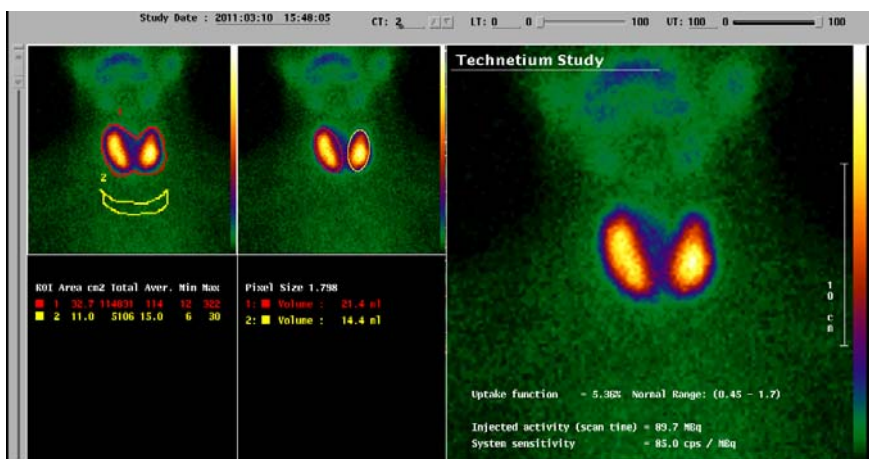
Three cases

multinodular goitre, first treatment



Volume 39 ml, uptake value 60%, given activity 336 MBq

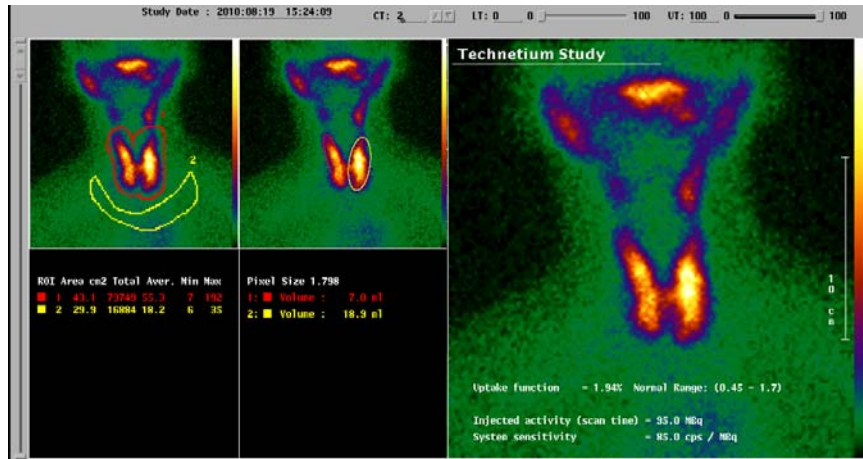
After 1:st treatment, mars 2011



Volume 36 ml, uptake value 58%, given activity 332 MBq (150 Gy)

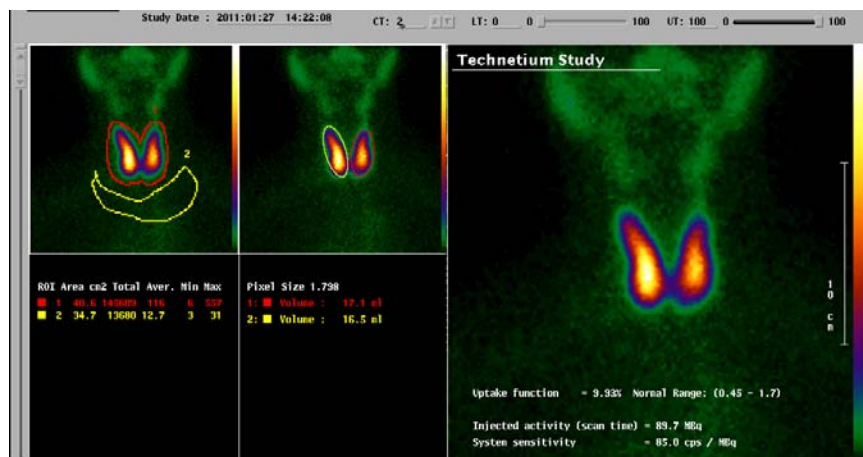
Thyroid replacement therapy: june 2011

Graves, 1:st treatment



Volume 26 ml, uptake value 47%, given activity 229 MBq (120 Gy)

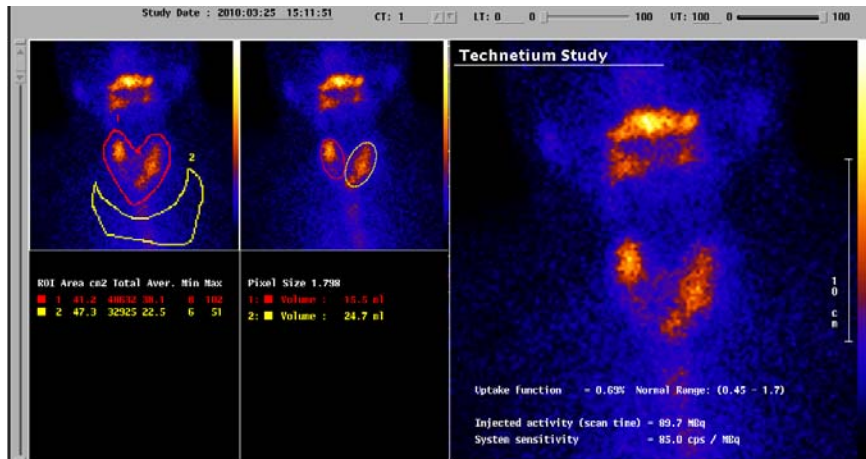
Graves, 2:d treatment



Volume 34 ml, uptake value 51%, given activity 284 MBq (120 Gy)

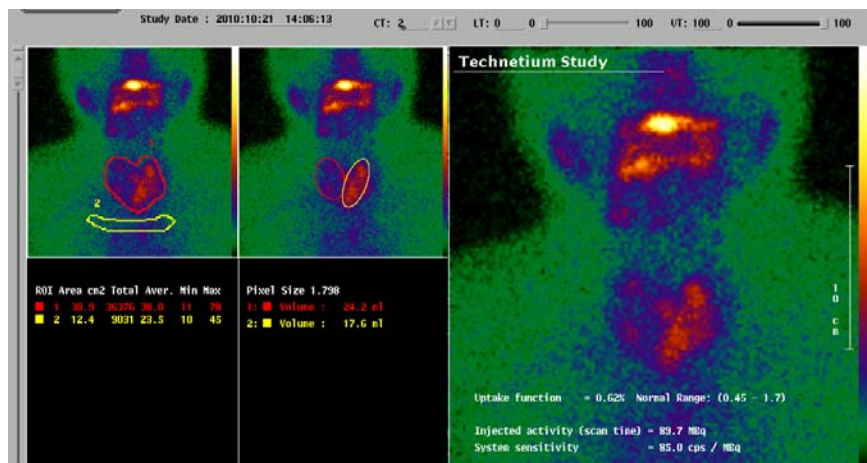
Thyroid replacement therapy, mars 2011

multinodular goitre, 1:st treatment



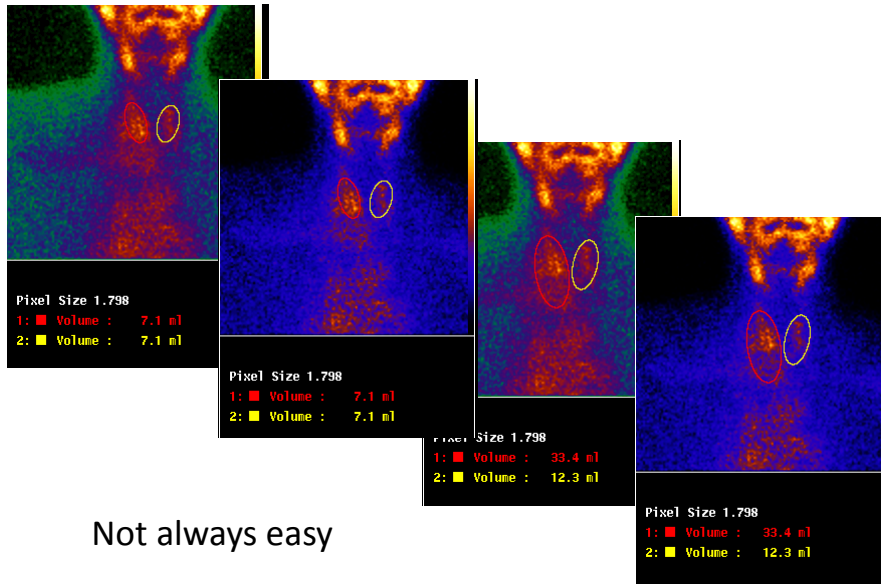
Volume 40 ml, uptake value 43%, given activity 408 MBq (150 Gy)

multinodular goitre, 2nd treatment



Volume 42 ml, uptake value ?%, given activity 893 MBq (150 Gy)
 euthyroid

Determination of the volume



Not always easy

Conclusion

- Graves disease: hypothyroid status is reached
- Multinodular goitre and toxic adenoma euthyroid status is reached
- Few second treatments, totally seven patients
- Volume determination is not so easy but seems not so crucial
- For more exact volume determination SPECT, SPECT/CT is needed, perhaps some activities are unnecessary high (mn.g.)