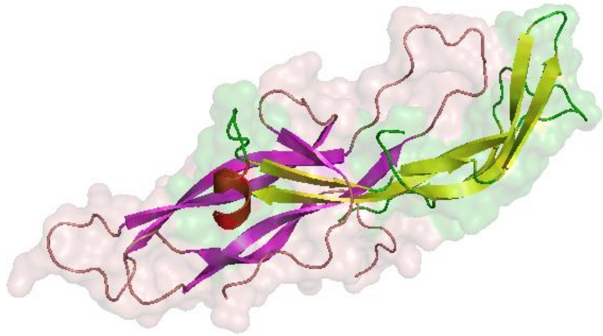

# „molecular brothers “


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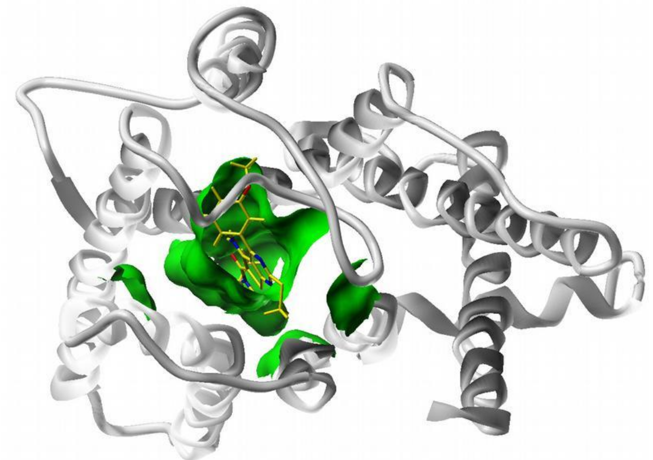


ESIM 2011

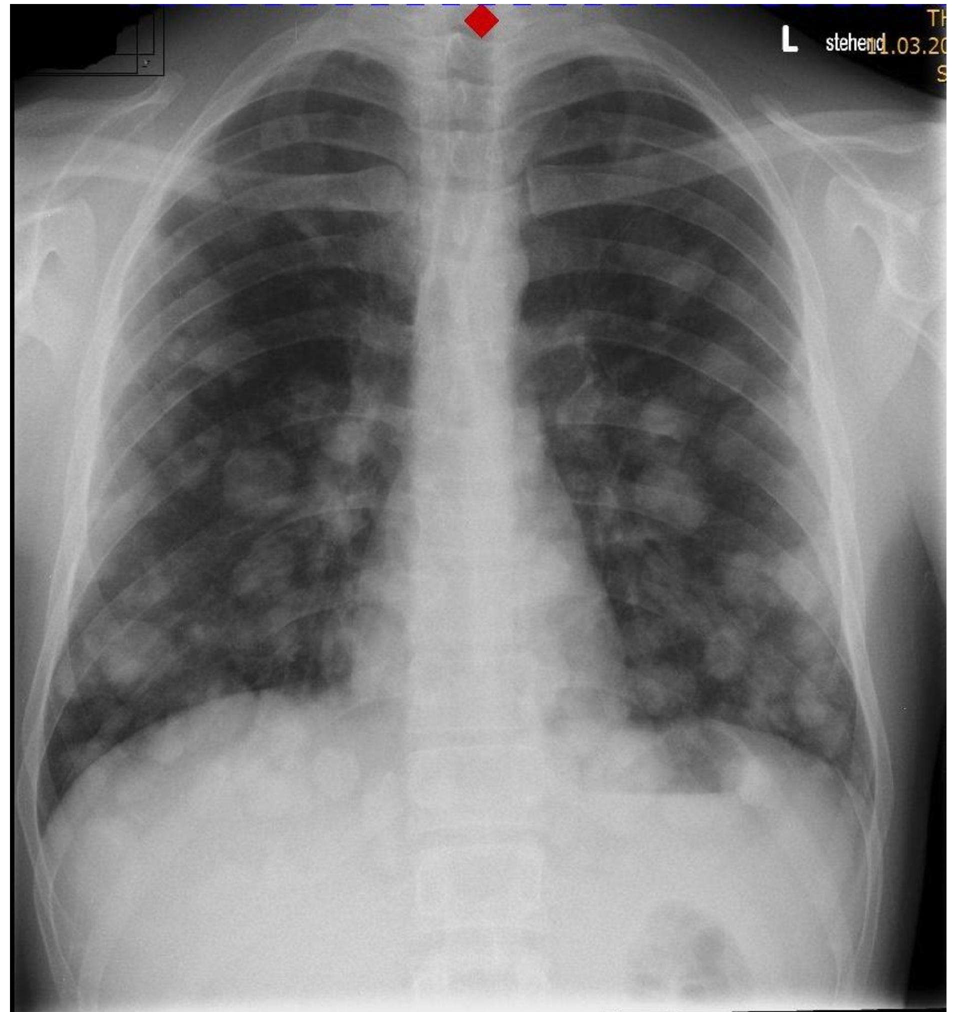
# Case Vignette

- A 25-year old man was admitted to our hospital because of fever, productive cough, nausea and weight loss.
- The patient had been in his usual state of health until fatigue, myalgia and night sweats developed several weeks ago. In the past 2 weeks he noted a weight loss of 2 kg.
- Because of these symptoms the patient was seen by his family doctor. The chest x-ray studies revealed ...

# Chest x ray

... „Multiple nodular infiltrates in both lungs“.

→ As an infectious etiology was suspected, empirical treatment with amoxicillin/clavunalate was initiated .



# Investigations

- Reduced general aspect, RR 105/75mmHg, HR 120 bpm, T 37.1 ° C. BMI 20.4 kg/m2
- Physical exam of the chest notable for a bilateral slight gynecomastia and painless testicular mass on the left side.
- Laboratory

| Clinical chemistry | | | |
|---|---|---|---|
| Analyte | Result | Units | reference value |
| Na | 136 | mmol/L | (135-145) |
| K | 3.8 | mmol/L | (3.4-4.5) |
| Ca | 2.36 | mmol/L | (2.15-2.55) |
| Crea | 71 | umol/L | (59-104) |
| ALT | 81 | U/L | (<50) |
| LDH | 1362 | U/L | (240-480) |
| alk. Phos. | 138 | U/L | (40-129) |
| CRP | 92 | mg/L | (<5) |

| Hematology | | | |
|---|---|---|---|
| Analyte | Result | Units | reference value |
| Lc | 11.9 | G/L | (2.6-7.8) |
| Neutrophil | 9.25 | G/L | (0.9-4.5) |
| Hb | 121 | G/L | (127-163) |
| MCV | 79 | fl | (80-97) |
| MCHC | 338 | g/L | (330-364) |
| Tc | 261 | G/L | (130-330) |

# Differential diagnoses ?

Fever, weight loss, rapid course over weeks, WBC (↑) , CRP (↑), Rx

Fever, weight loss, rapid course over weeks ; WBC (↑), CRP (↑), LDH (↑), Rx

- Infection?
- Neoplasm?
- Noninfectious inflammatory disease?
- Vascular disease
- Additional metabolic / endocrine disorder?

Clue : painless testicular mass, Rx (otherwhise epididymitis, orchitis possible)

Myalgia, skin and joints normal

PE (tachycardia, fever)

Weight loss , Nausea, tachycardia ( even when no fever present)

Serum tumor marker

| Analyte | Result | Units | reference value |
|---|---|---|---|
| AFP | 50.6 | ug/L | (<7) |
| HCG | 690983 | IU/L | (<4.0) |

# Investigations III

→Before administering a iodine-containing contrast media for further evaluation by computed tomographys scans of the abdomen, the chest and the head, thyroid function tests were obtained.

Thyroid function tests

| Analyte | Result | Units | reference value |
|---|---|---|---|
| TSH | <0.01 | mU/L | (0.27-4.20) |
| fT4 | 50.7 | pmol/L | (10-23) |
| fT3 | 22 | pmol/L | (3.1-6.8) |

| Analyte | Result | Units | reference value |
|---|---|---|---|
| TRAb | negative | | negative |

→ 1° thyrotoxicosis

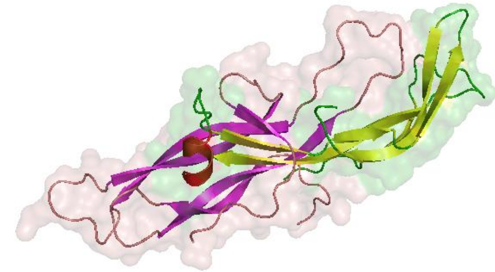
→ no features of grave‘s disease, no opthalmopathy or dermopathy

Ultrasonography: normal

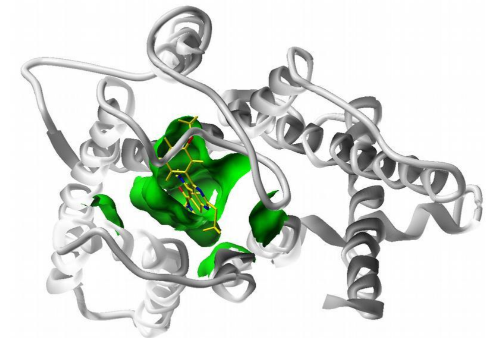
radionuclide scan before CT for further evaluation ?

# summary

- Germ cell tumor



- Thyrotoxicosis



# Follow up

- An initial course of antithyroidal therapy (perchlorate, carbimazol) was started and the patient underwent inguinal orchiectomy. The histology showed a non-seminoma (70% teratoma yolk sac 30%). The staging evaluation with CT scans revealed multiple metastases in both lungs, the abdomen and possibly in the brain.
- Chemotherapy with Ifosphamid, Etopophos and Cisplatine was started
- After 4 Weeks of antithyroidal therapy with carbimazol the TSH and fT4/fT3 were in the lower normal range.

Thyroid function tests

| Analyte | Result | Units | reference value |
|---|---|---|---|
| TSH | 2.37 | mU/L | (0.27-4.20) |
| fT4 | 11.3 | pmol/L | (10-23) |
| fT3 | 4.6 | pmol/L | (3.1-6.8) |

→ The biochemical evidence of hyperthyroidism disapeared with the treatment of the GCT!!!!

# Hyperthyroidism and hCG

## Women

Hyperemesis gravidarum (nausea, vomiting, weight loss during early pregnancy)

may be caused by high serum hCG and estradiol concentrations or secretion of hCG with increased biological activity.

Many of these women have either subclinical or mild overt hyperthyroidism, but rarely require antithyroid treatment.

## Men

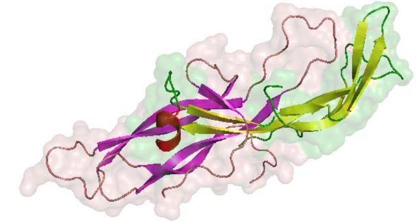
In men with NSGCTs,

with markedly elevated serum beta-hCG levels

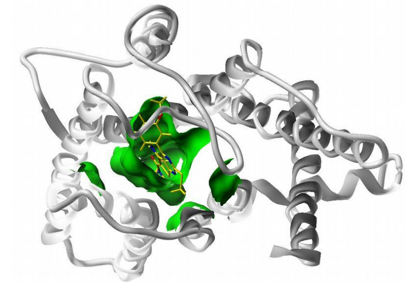
The frequency of this complication was illustrated by a series of 144 patients with germ cell tumors by Oosting and collegues in 2010. 5 patients (3.5 %) with hyperthyreoidism were identified, who had all high serum hCG (mean 1 325 147 IU/L).

Free thyroxin levels normalized within 26 days after starting chemotherapy in all patients.

# „molecular brothers“



Beta hCG



TSH-Receptor

TSH is a glycoprotein and consists of two subunits, the *alpha* and the *beta* subunit.

The α (alp*ha) s*ubunit of TSH is identical to that of human chorionic gonadotropin (HCG).

The β (beta) *subu*nit (TSHB) is unique to TSH, and therefore determines its function.

# treatment for testicular cancer

- Stage I and II: inguinal orchyectomy followed by retroperitoneal lymph node dissection

- Patient with either histology with bulky nodes or stage III Chemotherapy (standard Cisplatin, etoposide and bleomycin for four cycles)

Thanks for your attention !