Attachment POL case in thyroid diagnostics and treatment

“Live Wire”

71 year old Rosemarie L. from Essen doesn’t understand the world anymore: Lately she has fallen out with all her neighbours and many of her friends. Her husband Wolfgang avoid her presence and prefers to walk the dog several hours a day. In some way she can understand the reaction of the people around her as even she herself lately has an increasing feeling of not knowing herself. Also, she has noticed sweating profusely of late. At some point it all gets too much and she sees her GP.

After a thorough examination, a blood sample and an ultrasound examination of her abdomen and neck her GP tells her, “Your thyroid is not working properly. We need to run more checks and I’m sending you to see a specialist.” Rosemarie L. leaves the surgery with a referral to a specialist in nuclear specialist surgery. She is completely confused: What are they going to do to her? Isn’t that dangerous? Will I need surgery?

Background Information for Students

Current Anamnesis:

For approx. 6 months Rosemarie L. has suffered from an increased tendency to perspire, inner anxiety and is increasingly irritable. When asked, she also mentions that she has lost some weight recently. She also states she has a feeling she is loosing hair.

Patient History:

There are no known significant prior illnesses.

Social Anamnesis:

Mrs L. has been a pensioner for some days and previously worked half-days in a clothing shop. She is married and has two adult children, a son who lives locally and a daughter who lives in Schleswig Holstein. She looks after her grandchildren, aged 5 and 9, twice a week when her son and daughter in law are working. She enjoys this but sometimes feels it gets a bit much, especially since she also has to drive the children to various leisure activities.

Family Anamnesis:

Mrs L. states that her mother and aunt had thyroid surgery. Other than that, her family only had the “usual illnesses”.

Vegetative Anamnesis:

Appetite:	Big, on some occasions virtual eating frenzies.
Thirst:	Normal.
Sleep:	Fitful. Problems going to sleep and sleeping through.
Night sweats:	No.
Weight:	Lost 4kg in the last 3 months.
Bowels:	Increased bowel movements compared to previously (2-3 x per day). Soft consistency, normal colour, no blood on stool.
Micturition:	Normal.
Temperature:	37.1°C
Allergies:	None.

Drug Anamnesis:

Occasional use of Paracetamol for headaches, vitamin and mineral tablets from the health food shop (name unknown). No other medication.

Physical Examination:

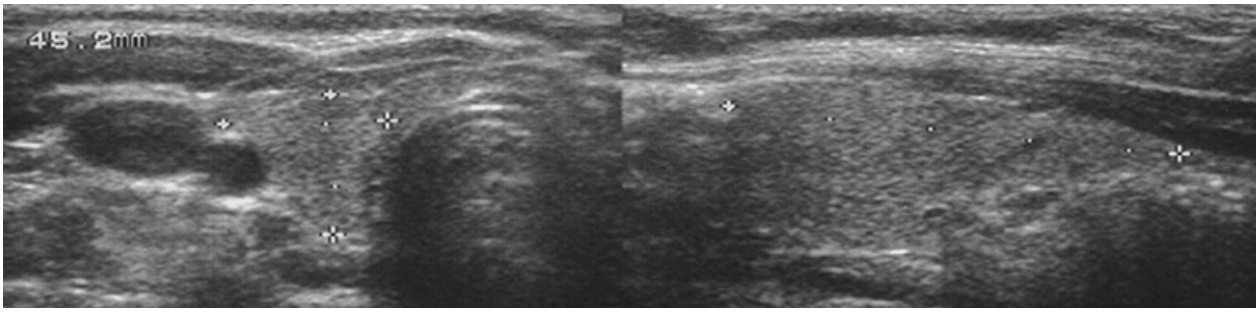
Age:	71 years.	
Height:	168cm	
Weight:	61kg	
General Condition:	Good.	
Mental State:	Clear.	
Nutritional Condition:	Slim.	
Skin:	Skin is warm and appears reddish and moist. Skin has a silky feel to it. Thin hair.	
Head and Neck:	Eyes:	No reddening, no exophthalmos.
	Lymph Nodes:	No enlarged LN palpable.
	Thyroid:	Noticeably palpable on left. Moves well on swallowing. No knots.
Lungs:	Overall normal pulmonary findings.	
Heart:	Frequency: 96 beats/min at rest.	
	Pulse: Regular.	
	Blood Pressure: 150/85 mmHg at rest.	

Lab results:

Parameters	**Value**	**Normal**
Basal thyroid stimulating hormone (TSH)	0.01 uU/ml	0.3 – 2.5
Free triiodothyronine (fT3):	5.1 pmol/ml	3.1 – 6.5
Free thyroxine (fT4):	20.8 pmol/ml	10.3 – 22.2
Thyroid peroxidase antibody (anti-TPO-AB)	24 uU/ml	< 50
TSH receptor antibody (TRAB):	Not traceable	< 1.5
Thyroglobulin antibody (anti-TG-AB)	Not traceable	< 9

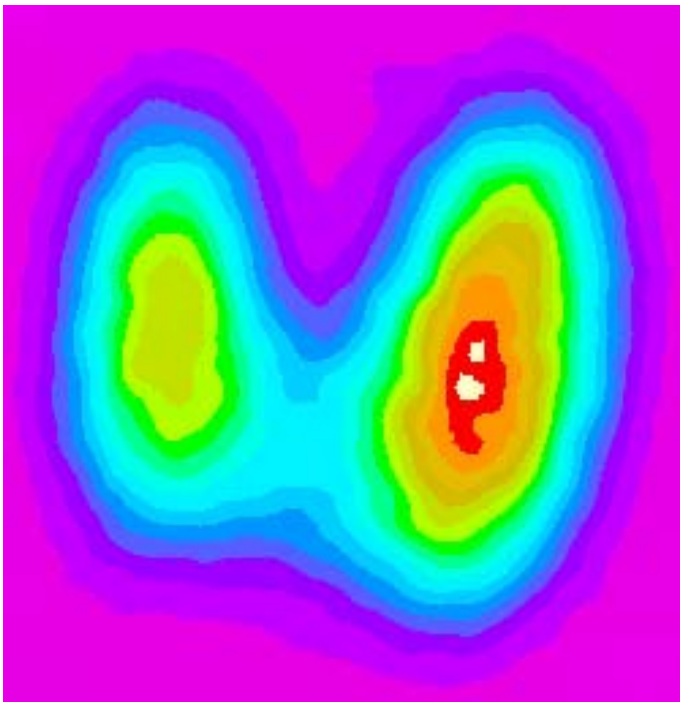
Sonogram:

Total volume 25ml (right thyroid lobe 10ml, left thyroid lobe 15ml), no knots, normal echogenicity.



Scintigraphy:

Thyroid scintigram from ventral 15 minutes after application of 60MBq MBq ^{99m}Tc-Pertechnetate:



Global uptake was 2.1% (normally under suppression conditions < 1.5%)

Background Information for Tutors

If you consider it useful, you can give this information to particularly interested students in exceptional cases but only after the case has been worked through and the learning goals have been achieved.

Diagnosis

- Struma diffusa with a functionally relevant disseminated thyroid autonomy
- Latent hyperthyroidism

Treatment and Progression

- Discontinuing the vitamin and mineral supplement which, following query, has turned out to contain iodine.
- Low iodine diet.
- Decision for definitive treatment (surgery, radioiodine therapy=RIT).
- Patient preferred RIT and was treated with 600 MBq 121I. The organ dose achieved was 210 Gy. Patient was on the nuclear medicine ward for 4 days.
- Follow-up 6 months later showed euthyroid metabolic state of the patient and freedom from complaints. No signs of residual autonomy in scintigraphy.
- Arranging relapse prevention with 200µg iodine.

Bibliography:

- Hotze L-A, Schumm-Draeger P-M. Schilddrüsen-Krankheiten. Diagnose und Therapie. 5. Auflage. Berlin: Berliner Medizinische Verlagsanstalt; 2003.
- Meng W. Schilddrüsenerkrankungen. 4. Auflage. München: Urban und Fischer Verlag; 2001.
- Guidelines of the German Society for Nuclear Medicine (DGN) via www.nuklearmedizin.de

Script for the First Virtual POL Seminar

- Welcome and check that all the media is working for all participants (“I am delighted that tonight we will conduct our first joint POL seminar. I’m looking forward to the course of the discussion. I would initially like to ask you to just say “hello” so we know the technical side of the seminar is working correctly.”)
- Introduction with repetition of key POL points. (“As you all know from previous seminars, the POL seminars rely mostly on your work and I only have a role as tutor or moderator. This means I’m basically a passive listener and will only intervene regarding organisational issues and timing. In terms of content, I will usually only act if you’re completely on the wrong track or if you decide to call upon an “expert opinion”.)
- Starting POL work. (“If there are no organisational questions left, I would like to ask a participant to read the POL case out loud.”)
- Step 1: Clarify unfamiliar terms (“What terms are you not familiar with and need explaining?” “Who is familiar with the term XY?”)
- Step 2: Topic identification or problem definition. From that point on, the conversation should ideally run within the group itself. If not, this must be triggered. (“What problems are presented in the text” “Which aspects of the text do you want to deal with?”)
- Step 3: Brainstorming (analogous to Step 2)
- Step 4: Forming hypothesis and systematisation (analogous to Step 2)
- Step 5: Formulating learning goal (analogous to Step 2)
- Step 6: Learning time. At this point it is probably necessary for the moderator to remind students again of the seminar schedule and to decide binding agreements with individual groups on further action including deadlines (“So I summarize: By XX you will send me a PowerPoint file and a 1 page summary in which you deal with the aspect XY. I’ll edit the documents by YY, so we can discuss the results on ZZ at the next online session.” In case of scheduling problems, where appropriate, a Doodle survey (http://www.doodle.com) can be suggested.
- Summary of results, thanks for participating, offer to answer more questions on the forum or via email if necessary.

Script for the Second VirtuaL POL Seminar

- Welcome and check that all the media is working for all participants (“I am delighted to see you all for our second joint POL seminar tonight. I have read your comments with interest and look forward to an exciting seminar. Before we get started, can I ask you to just say “hello” so we know the technical side of the seminar is working correctly?”)
- Introduction with repetition of the POL case and the question distilled during the previous seminar. (“During the last meeting, we discussed the case “Live Wire”. I would like one of you to summarize the results of the last meeting and I look forward to your updated short presentation.”)
- Step 7: Synthesis of knowledge and final debate (From this point on, the debate ideally should be running within the group by itself, if not this must be triggered.)
- Summary of results, thanks for participating, offer to answer more questions on the forum or via email if necessary.
- Feedback session (What did you like about the seminar? What would you do differently next time? What did you like about the assistance? Where do you see possible improvements in the assistance received? Would you recommend the POL seminar to fellow students?)
- Farewell with thanks for cooperation and note that other POL cases can be worked upon and that we would welcome it if they could recommended the POL seminar if they found it worthwhile.

Intended Learning Goals in Thyroid Diagnosis and Treatment

The intended learning goals should not be passed on to students: first, the content of the POL session should not be influences (and students of future years). Second, they represent the content of the accompanying course and are not to be dealt with exhaustively in POL. The aim is for the students to work through one of the points below.

Learning Goals:

Anatomy, biochemistry, physiology and pathophysiology:

- Ability to explain macro-anatomy of the thyroid using a model.
- Ability to draw and explain the histological structure of thyroid.
- Ability to explain the thyroid iodine metabolism.
- Understandin the synthesis of thyroid hormones.
- Ability to explain the hypothalamic-pituitary control of thyroid hormone secretion.
- Ability to name the metabolic effects of thyroid hormones.
- Familiarity of students with options of lab diagnostics and ability to name them.

Endocrinology:

- Students should be able to explain the causes of hyperthyroidism (autonomy, immuno-thyreopathy, thyrotoxicosis factitia)
- Causes of struma formation should be named (iondine deficiency struma).

Nuclear Medicine:

- Ability to name the main methods of thyroid diagnosis (especially ultrasonography and scintigraphy including suppression scintigraphy)
- Ability to explain the principle of RIT in cases of benign thyroid diseases.
- Students should know that there are malignant thyroid illnesses (keyword “cold node”)
- Students should be able to explain the mechanisms of thyrostatics (inhibition of iodine uptake, inhibition of thyroid peroxidase)