CASE REPORT

Acute thyroid swelling and elevated C reactive protein

Christian A Nebiker,¹ Tarik Delko,¹ Henryk Zulewski,² Daniel Oertli¹

¹Department of General Surgery, University Hospital Basel, Basel, Switzerland
²Division for Endocrinology, University Hospital Basel, Basel, Switzerland

Correspondence to
 Dr Christian A Nebiker,
 christian.nebiker@usb.ch

SUMMARY

A 34-year-old lady presented with a painful swelling of the left thyroid lobe since 1 week and elevated C reactive protein (CRP) above 100 mg/L. An ultrasound examination revealed a thyroid cyst with partly solid component, suitable with a haemorrhage into a cyst. The serum thyroid stimulating hormone (TSH), as well as peripheral thyroid hormones, was in the normal range. The acute swelling could be well explained by a haemorrhage, but not an elevated CRP. Her medical history was uneventful apart from a tooth extraction 2 weeks ago due to an infection. Therefore, our hypothesis was a haemorrhage into a pre-existing thyroid cyst during bacteraemia caused by the tooth infection. Conservative treatment with the aim of delayed hemithyroidectomy failed due to a second episode of haemorrhage. During surgical resection pus drained out of the cyst and the histological report afterwards confirmed our tentative diagnosis. The patient was discharged 2 days later.

BACKGROUND

An acute painful swelling of the thyroid opens a circumscribed field of differential diagnosis. Multinodular goitre or follicular adenomas are unlikely due to the short time of development and the concomitant pain. Hashimoto's thyroiditis usually presents with a goitre, which can be painful, but normally needs more time to develop.¹ A possible pathogenesis could be a sudden haemorrhage into a thyroid cyst. Is it associated with an elevated C reactive protein (CRP) as present in our case? Rich blood and lymphatic supply, as well as iodine content protect the thyroid of infections. Thus, rare cases of acute suppurative thyroiditis are described.²⁻³ The aetiology can be a haematogenous seeding of bacteria or a persistence of the pyriform sinus tract.

CASE PRESENTATION

A 34-year-old woman was admitted to the emergency room with a painful swelling over the left lobe of thyroid which emerged 1 week ago and increased in size since then. She was suffering from mild dyspnoea, dysphagia and pain especially when she turned the head towards the left side. On clinical examination the left thyroid was tender under palpation, but not the right one. There was no erythema visible and she had no fever. Her medical history was uneventful apart of a tooth infection 2 weeks ago, which was treated by tooth extraction. In her mouth the little wound was almost healed and showed no signs of infection.

INVESTIGATIONS

The laboratory studies on admission revealed a CRP of 118 mg/L (normal range <10 mg/L) and a slightly elevated white cell count of $11 \times 10^9/L$. Serum measurements of the thyroid stimulating hormone (TSH) as well as peripheral thyroid hormones were in the normal range. Thyroid ultrasonography could identify a cyst of $33 \times 31 \times 30$ mm with some hyper echogenic content compatible with partly coagulated blood (figure 1). By ultrasound guided fine needle aspiration (FNA) 16 mL of brown liquid was sucked out of the cyst. A complete drainage was impossible due to some solid structures within the cyst. The aspirated liquid was partly sent in for microbiological investigation. Gram staining revealed no bacteria.

DIFFERENTIAL DIAGNOSIS

The ultrasound finding revealed a thyroid cyst and its content looked like old blood. Therefore, we assumed a haemorrhage in a pre-existing small thyroid cyst of the left lobe. Owing to the elevated CRP a superinfection was suspected. Our hypothesis therefore was a haemorrhage into the cyst in the moment of bacteraemia during the tooth infection.

TREATMENT

As a consequence of our hypothesis an antibiotic treatment with amoxycillin and clavulanic acid was administered. The pain released and the CRP dropped to almost normal levels over the next few days. Just before hospital discharge the pain and swelling recurred and CRP rose again. In the meantime the result of the microbiological culture of the initial aspirate came back showing no bacterial growth. We decided at this point to proceed directly with a hemithyroidectomy and waited no longer for a resolution of the inflammation. During the surgical procedure small amounts of pus drained out of the cyst.

OUTCOME AND FOLLOW-UP

The further postoperative course was uneventful and the patient could leave the hospital 2 days later.

The histological examination revealed a follicular nodule with a cystic component. A subacute haemorrhage with pus was described in the final report because of numerous red blood cells in the cyst and a massive infiltration by neutrophils (figure 2).

To cite: Nebiker CA, Delko T, Zulewski H, et al. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-200427

Figure 1 Haemorrhage into thyroid cyst with liquid (A) and solid parts (B).

DISCUSSION

Haemorrhaging into a thyroid cyst or nodule (forming a cyst) is a quite frequent phenomenon; however, its incidence is described nowhere in literature.^{4–7} Owing to the fact of no medical history of thyroid disease in our case, the cyst or nodule might have been small and therefore unapparent. A haemorrhage into a cyst explains well the sudden onset of pain combined with a swelling of the thyroid. The surprising parameter was an elevated CRP at first presentation. Normal TSH and no history of thyroid disturbance excluded almost a thyroiditis (Hashimoto's) even before performing an ultrasound examination. Further interviews concerning her medical history revealed a tooth infection 2 weeks ago. Our suspicion was that the haemorrhage into the thyroid cyst occurred during bacteraemia caused by the tooth infection, especially as the patient reported not having taken any antibiotics before tooth extraction. Owing to the fact that the left lobe of thyroid consisted almost only of a cyst, soon or later she needed a hemithyroidectomy. In order to prevent spreading of the actual infection into healthy tissue and to prevent intraoperative bleeding we planned to perform resection in a non-inflamed situation ('à froid'). The first few days of our plan seemed to be successful until a second episode of haemorrhage. The pus found during surgical resection and the histological report confirmed our

suspicion of a superinfected thyroid cyst. Surprisingly the microbiological culture as well as the Gram staining was not able to demonstrate the causing bacteria. Maybe the germs were anaerobic and were destroyed on transfer into the medium.

Thyroid cystic nodules become apparent either by the patient when they reach a certain size or incidentally during radiological procedures such as the carotid ultrasonography, CT or the MRI of the neck.⁸ Thyroid cysts can become symptomatic, especially in the case of an acute haemorrhage. It can even be stated that thyroid cysts are the most common cause of thyroid pain. Most of the thyroid cysts develop by cystic degeneration of solid nodules. Only in rare case a simple cyst can be found under the microscope without solid components. Most of the thyroid cysts derive from adenomas and are therefore benign. With a higher proportion of a solid part, especially in excentric localisation, the risk of malignancy increases.⁹ The diagnostic approach for thyroid cysts is the same as for thyroid nodules. Owing to the fact that most of the cysts are accompanied by a solid nodule, thyroid cysts should undergo the same diagnostic steps including serum TSH, ultrasound of the thyroid and if indicated an FNA. According to the American Thyroid Association Guidelines, patients with mixed cystic solid nodules are getting an FNA above the size of 2 cm. If suspicious sonographic features can be detected, an FNA is recommended above a size of 1.5 cm.¹⁰ In

Figure 2 (A) On the right side we see a thyroid cyst with haemorrhage and infiltration by neutrophils at the border. On the left side documentation of residual thyroid follicles. H&E $\times 40$. (B) Content of thyroid cyst: mixture of degrading neutrophils and red blood cells. H&E $\times 200$.

case of thyroid pain, FNA aspiration of the liquid content releases most of the pain normally. Half of the cysts disappear after aspiration, but the majority of them fill up again. In case of recurrent thyroid cyst, other therapeutic options as surgical resections or instillation of sclerosing ethanol, especially in larger cysts.^{11 12}

In literature many reports about thyroid cysts can be found, but none about superinfected ones. Owing to the fact that the thyroid and all other endocrine organs are well perfused, intrathyroidal abscesses are rare. The mechanism of infection is haematogenic or by a persistent pyriform sinus tract. In our case we postulate a haemorrhage into the cyst during bacteraemia.

In the present case we wanted to highlight the fact that a haemorrhage of thyroid cyst is painful and causes swelling, but usually no CRP elevation occurs. In such cases an infection needs to be excluded.

Learning points

- ▶ Haemorrhage into thyroid cyst causes swelling, sometimes pain but normally no C reactive protein (CRP) elevation.
- ▶ Although an infection of a thyroid cyst is rare, in case of elevated CRP, it needs to be ruled out.
- ▶ In case of a superinfected thyroid cyst, persistent pyriform sinus tract and haematogenic mechanisms need to be considered.

Contributors CAN did the manuscript writing; CAN and HZ contributed to the conception and design assembly of data; TD and DO contributed to the data collection and final approval of the manuscript.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Zimmerman RS, Brennan MD, McConahey WM, *et al.* Hashimoto's thyroiditis. An uncommon cause of painful thyroid unresponsive to corticosteroid therapy. *Ann Intern Med* 1986;104:355–7.
- 2 Sai Prasad TR, Chong CL, Mani A, *et al.* Acute suppurative thyroiditis in children secondary to pyriform sinus fistula. *Pediatr Surg Int* 2007;23:779–83.
- 3 Paes JE, Burman KD, Cohen J, *et al.* Acute bacterial suppurative thyroiditis: a clinical review and expert opinion. *Thyroid* 2010;20:247–55.
- 4 Chan CC, Awobem A, Binns C, *et al.* A rare case of spontaneous thyroid cyst haemorrhage. *J Laryngol Otol* 2012;126:960–2.
- 5 Kim DW. Ultrasound-guided fine-needle aspiration of benign thyroid cysts or partially cystic thyroid nodules: a preliminary study for factors predicting successful collapse. *Endocrine*. Published Online First: Apr 2013. doi:10.1007/s12020-013-9948-4
- 6 Paleri V, Maraju RS, Ali MS, *et al.* Spontaneous retro- and parapharyngeal haematoma caused by intrathyroid bleed. *J Laryngol Otol* 2002;116:854–8.
- 7 Szeto LD, Hung CT. Haemorrhage of a thyroid cyst as an unusual complication of intubation. *Anaesth Intensive Care* 2002;30:230–3.
- 8 Tan GH, Gharib H. Thyroid incidentalomas: management approaches to nonpalpable nodules discovered incidentally on thyroid imaging. *Ann Intern Med* 1997;126:226–31.
- 9 Lee MJ, Kim EK, Kwak JY, *et al.* Partially cystic thyroid nodules on ultrasound: probability of malignancy and sonographic differentiation. *Thyroid* 2009;19:341–6.
- 10 Cooper DS, Doherty GM, Haugen BR, *et al.* Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid* 2009;19:1167–214.
- 11 de los Santos ET, Keyhani-Rofagha S, Cunningham JJ, *et al.* Cystic thyroid nodules. The dilemma of malignant lesions. *Arch Intern Med* 1990;150:1422–7.
- 12 Valcavi R, Frasoldati A. Ultrasound-guided percutaneous ethanol injection therapy in thyroid cystic nodules. *Endocr Pract* 2004;10:269–75.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow