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Diagnostic and Therapeutic Management of a Painful Thyroid Mass with Discordant Thyrotropin and Thyroid Hormone Measurements: A Case Report

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ABSTRACT

Background: Thyroid nodules presenting with elevated circulating thyroid hormones but a non-suppressed thyrotropin (TSH) poses a diagnostic and therapeutic challenge, particularly where free-hormone assays, ultrasonography, scintigraphy, cytology, and histopathology are unavailable.

Case presentation: A 30-year-old woman presented with a painful, progressive left neck mass of one year's duration. She was clinically euthyroid. Total triiodothyronine was 4.46 nmol/L and total thyroxine 189.55 nmol/L, with a non-suppressed TSH of 0.39 mIU/L (reference 0.30–4.20 mIU/L). Mild leukopenia (white cell count 3.91 × 10^9/L) and a platelet count of 334 × 10^9/L were noted. Thyroid ultrasonography, fine-needle aspiration, scintigraphy, free-hormone assays, and histopathology were not available at the treating facility, and the family could not fund referral histopathology. After multidisciplinary discussion, left hemithyroidectomy was performed without preoperative antithyroid drugs. The recurrent laryngeal nerve and parathyroid glands were preserved. Estimated blood loss was approximately 35 mL. There was no perioperative thyroid crisis, vocal change, or clinical hypocalcemia. At day-7 the wound healed and neck pain had resolved. Postoperative thyroid function tests and longer-term biochemical follow-up were not obtained.

Conclusion: In this patient, clinical euthyroidism and a non-suppressed TSH, together with baseline leukopenia, supported withholding thionamides and proceeding to hemithyroidectomy for a symptomatic mass. These observations apply to the circumstances described and do not constitute a validated general management algorithm. Lack of imaging, cytology, histopathology, and postoperative thyroid function tests is a major limitation.

Keywords: *Thyroid Nodule; Hemithyroidectomy; Discordant Thyroid Function Tests; Euthyroid Hyperthyroxinemia; Resource-Limited Setting; Case Report*

INTRODUCTION

Thyroid nodules are common. Palpable thyroid masses are identifiable in approximately 4–7% of adults, and ultrasound-detectable nodules may be present in a much larger proportion of screened populations [1,2]. Contemporary guidelines for adult thyroid-nodule evaluation rest on clinical assessment, measurement of TSH (with free thyroxine when TSH is abnormal), high-resolution ultrasonography, and, when indicated, ultrasound-guided fine-needle aspiration (FNA) [3,4]. In usual physiology an inverse log-linear relationship exists between free thyroid hormones and pituitary TSH [5]. Autonomous hypersecretion by a hyperfunctioning nodule (toxic adenoma) typically suppresses TSH, often to <0.1 mIU/L [6].

Occasionally, laboratory testing shows elevated total triiodothyronine (T3) and thyroxine (T4) with a normal, non-suppressed TSH. This pattern does not establish a single diagnosis. The differential includes euthyroid hyperthyroxinemia related to binding-protein abnormalities, the early phase of an autonomously functioning nodule before full TSH suppression, immunoassay interference (including heterophile antibodies and biotin), and, rarely, resistance to thyroid hormone [7–9]. In well-resourced settings these possibilities may be refined with free-hormone assays (preferably by equilibrium dialysis or tandem mass spectrometry), binding-protein measurement, scintigraphy, and, when indicated, genetic testing [7,8]. In many regional hospitals in sub-Saharan Africa such investigations are unavailable [10,11]. Clinicians must then weigh the theoretical risk of perioperative thyrotoxic crisis against the need to treat a symptomatic neck mass [12].

We report the evaluation and hemithyroidectomy of a young woman with a painful left thyroid mass, elevated total T3 and T4, a non-suppressed TSH, and mild leukopenia, managed in a resource-limited hospital without ultrasonography, FNA, scintigraphy, or histopathology. Possible explanations for the biochemical discordance are presented as hypotheses, not as confirmed diagnoses.

CASE PRESENTATION

Patient information

A 30-year-old woman presented to the surgical outpatient clinic of Hospital Protestant de Ngaoubela with a progressive swelling on the left side of the neck. She first noticed a small, painless lump about one year before admission. The swelling enlarged gradually. Localized dull pain then developed and prompted hospital attendance.

She reported no dyspnea, dysphagia, odynophagia, or hoarseness. She denied palpitations, heat intolerance, diaphoresis, involuntary weight loss, tremor, hyperdefecation, and emotional lability. There was no known chronic endocrine, autoimmune, or hematological disease and no previous surgery. Obstetric history was gravida 2, para 1, with Living 1. Family history was negative for goiter, thyroid cancer, and multiple endocrine neoplasia. She did not smoke or drink alcohol and reported no prior head or neck irradiation.

Clinical findings

She was alert and not in distress. Blood pressure was 109/79 mmHg, pulse 90 beats per minute (regular, normal volume), temperature 36.1 °C, and weight 61 kg. Heart sounds were normal without murmur. The chest was clear without stridor. The abdomen was soft without organomegaly. Deep-tendon reflexes were normal; there was no outstretched-hand tremor.

The anterior neck showed an asymmetrical left thyroid mass, approximately 4.5 × 3.5 cm, firm to rubbery, mildly tender on deep palpation, and mobile with swallowing. There was no tracheal deviation, skin or muscle fixation, or palpable cervical lymphadenopathy.

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Timeline
Table 1 summarizes the clinical course.

Timepoint	Event
Month −12	Patient notices a small, painless left neck lump.
Month −1	Lump enlarges; localized dull pain develops.
Day 1 (admission)	Clinical assessment: clinically euthyroid; pulse 90 bpm; stable vital signs. Laboratory tests ordered.
Day 2	Elevated total T3/T4; TSH 0.39 mIU/L (non-suppressed); mild leukopenia.
Day 3	Pre-anesthetic evaluation. Thionamides withheld because of clinical euthyroidism, non-suppressed TSH, and baseline leukopenia.
Day 4 (operation)	Left hemithyroidectomy. Recurrent laryngeal nerve and parathyroid glands preserved. Estimated blood loss ~35 mL. No thyroid crisis.
Days 4–5	Uneventful ward recovery; drain output low; clinically normocalcemic; normal voice.
Day 6	Discharge on oral analgesics; drain removed.
Day 13 (clinic)	Wound healing well; pain resolved; voice normal. Histopathology and postoperative thyroid function tests not obtained (see Limitations).

Table 1. Timeline of presentation, intervention, and short-term follow-up.

Diagnostic assessment
Complete blood count (Table 2) showed a white-cell count of 3.91 × 10^9/L (reference 4.00–10.00), granulocyte count 1.81 × 10^9/L (reference 2.00–7.80), and platelet count 334 × 10^9/L (local reference 100–300). Hemoglobin was 131 g/L.
Thyroid function tests (automated immunoassay of total hormones; Table 3) showed TSH 0.39 mIU/L (reference 0.30–4.20), total T3 4.46 nmol/L (reference 1.23–3.07), and total T4 189.55 nmol/L (reference 66.00–181.00). Free T3, free T4, thyroxine-binding globulin, thyroid autoantibodies, and heterophile-antibody or biotin interference studies were not available.

Thyroid ultrasonography, FNA cytology, and radioisotope scintigraphy were not performed because they were not available at the treating hospital and could not be funded off-site. The working clinical diagnosis was a symptomatic solitary left thyroid mass. The biochemical pattern (elevated total T3/T4 with non-suppressed TSH) was recorded as discordant and unexplained. Possible explanations, euthyroid hyperthyroxinemia, early nodular autonomy, assay interference, or (least likely on clinical grounds) thyroid-hormone resistance—could not be confirmed or excluded. Malignancy could not be excluded without cytology or histopathology.

Therapeutic intervention
On hospital day 3 the team considered whether thionamides and beta-blockade were required before surgery. The patient was clinically euthyroid, TSH was not suppressed, and there was baseline leukopenia. Thionamides were therefore withheld, to avoid an unnecessary agranulocytosis risk in a patient who did not have overt thyrotoxicosis [13,14]. This was a case-specific judgment, not a protocol for all discordant thyroid function tests.
On day 4, left hemithyroidectomy was performed under general anesthesia with standard monitoring. A transverse collar incision was used. The left lobe contained a firm nodular mass measuring approximately 4.5 × 3.5 × 3.0 cm, without gross

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extracapsular invasion or adherence to the carotid sheath or trachea. The right lobe and isthmus appeared macroscopically normal. The superior thyroid vessels were ligated close to the gland. The left recurrent laryngeal nerve was identified in the tracheoesophageal groove and preserved. Both left parathyroid glands were identified and preserved with their vascular pedicles. The isthmus was divided. Estimated blood loss was approximately 35 mL. There was no intraoperative tachycardia, hypertension, or other feature of thyroid storm. A closed suction drain was placed. The patient was extubated awake with a normal voice.

The excised lobe was intended for histopathological examination. No histopathology service exists at the hospital, and the family had no funds to send the specimen to a distant laboratory. The specimen could not therefore be processed. This gap is acknowledged as a central limitation of the report.

Follow-up and outcomes

Immediate recovery was uneventful. Airway and hemodynamics were stable (blood pressure 115/75 mmHg, heart rate 82 bpm). Drain output was 15 mL in the first 24 hours. The voice was normal. There was no clinical hypocalcemia (no paresthesia; Chvostek and Trousseau signs negative). The drain was removed on postoperative day 2. She was discharged the same day on oral paracetamol and a short course of ibuprofen.

At clinic review on postoperative day 13 the cervical wound was clean and healing. Neck pain had resolved. The voice remained normal. Postoperative thyroid function tests were not obtained because of cost and laboratory constraints. Longer-term clinical or biochemical follow-up is not available. These absences are limitations and preclude any claim of biochemical cure or exclusion of later hypothyroidism or recurrent thyrotoxicosis.

Patient perspective

With written consent, the patient stated: “For a whole year, I watched the lump in my neck grow larger, and when it started to ache constantly, I became deeply worried about my health and my ability to care for my family. Learning that my blood tests were somewhat unusual added to my initial anxiety. However, the doctors explained the surgical plan clearly and reassured me. Waking up from surgery with my normal voice and realizing the constant aching pain in my neck was entirely gone was an incredible relief. I am very grateful for the smooth recovery and feel completely restored to my normal daily life.”

DISCUSSION

Discordant thyroid function tests, elevated circulating thyroid hormones with non-suppressed TSH are uncommon and require cautious interpretation [7,8,15]. Published series often describe extensive laboratory work-up that was not accessible here. Most thyroidectomies reported from sub-Saharan African hospitals are performed for compressive multinodular goiter, overt toxic adenoma with suppressed TSH, or suspected cancer [11,16,17]. Standard teaching is that overt thyrotoxicosis should be controlled medically before elective thyroidectomy to reduce the risk of thyroid storm [6,12]. That teaching applies to confirmed thyrotoxicosis. It does not automatically apply to a clinically euthyroid patient whose only abnormality is elevated total T3/T4 with TSH still within the reference interval.

Interpretation of discordant thyroid function tests

Confirmed findings in this case are limited: a symptomatic left thyroid mass; clinical euthyroidism; elevated total T3 and total T4; TSH 0.39 mIU/L (within the local reference range, near its lower limit); mild leukopenia; and an uncomplicated hemithyroidectomy with short-term symptomatic relief.

The cause of the biochemical discordance was not established. Binding-protein excess can raise total hormone concentrations while free hormone and TSH remain normal [18]. Early autonomy of a nodule can raise hormone output before TSH is fully suppressed [6,19]. Immunoassay interference can produce spurious results [9,20]. Resistance to thyroid hormone is rare and was not investigated [21]. None of these mechanisms was demonstrated in this patient. Free-hormone measurement, binding-protein assays, interference work-up, and scintigraphy would have been required to move from

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possibility to diagnosis. Those tests were unavailable. Statements in earlier versions of this manuscript that attributed the profile to euthyroid hyperthyroxinemia or transitional autonomy with undue certainty have therefore been withdrawn.

Hematological findings and antithyroid drugs

Mild leukopenia and a modestly raised platelet count were recorded. Their mechanisms were not investigated. Benign ethnic neutropenia is common in some African populations [22], and reactive thrombocytosis can accompany inflammation [23], but neither was proven here. The practical relevance of the blood count was limited to the decision not to start thionamides, which carry a small but well-documented risk of agranulocytosis [13,14].

Surgery in a resource-limited setting

Where ultrasonography, FNA, and scintigraphy are absent, surgery for a progressive, painful mass may be both treatment of symptoms and the only remaining diagnostic step provided the family can obtain histopathology. In this case even histopathology was unaffordable. Hemithyroidectomy relieved pain and removed the mass, with nerve and parathyroid preservation and no perioperative crisis. That outcome supports feasibility of carefully selected surgery under the conditions described. It does not show that the approach is universally safe or curative, nor that it should be used as a general algorithm [16,17,24]. Figure 1 depicts only the pathway used for this patient.

LIMITATIONS

This report has substantial limitations. (1) No thyroid ultrasound, FNA, or scintigraphy. (2) No free T3/T4, binding-protein, autoantibody, or assay-interference studies. (3) No histopathological diagnosis of the excised lobe, because the hospital has no histopathology service and the family could not fund external processing. (4) No postoperative thyroid function tests and no follow-up beyond 7 days after discharge. (5) Single-patient observation. These gaps prevent definitive classification of the nodule and of the biochemical discordance.

CONCLUSION

A clinically euthyroid woman with a painful left thyroid mass, elevated total T3 and T4, and a non-suppressed TSH underwent uneventful left hemithyroidectomy without thionamide preparation in a hospital without imaging, cytology, or histopathology. Short-term pain relief and an intact voice were achieved. The biochemical discordance remains unexplained. The management described is specific to this patient and these constraints. It should not be read as evidence that the same pathway is generally safe, curative, or guideline equivalent.

CARE checklist

This revised manuscript was checked against the CARE case-report framework: title identifies the report as a case report; keywords are provided; abstract includes background, case, and conclusions; introduction states the rationale; patient information, clinical findings, timeline, diagnostic assessment, intervention, follow-up, and outcomes are described; the patient's perspective and informed consent are included; discussion separates confirmed findings from hypotheses and states limitations. Histopathology, advanced diagnostics, and long-term biochemical follow-up could not be reported because they were not obtained.

Patient consent

Written informed consent was obtained from the patient for publication of this case report and anonymized laboratory data. A copy of the consent form is available for review by the Editor-in-Chief on request. Identifying details have been omitted.

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Ethical approval
Management and retrospective reporting complied with the Declaration of Helsinki. The Institutional Ethics and Review Board of Hospital Protestant de Ngaoubela, Cameroon, exempted formal review because this is an anonymized report of standard care without experimental intervention.

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Conflict of interest
The authors declare no competing interests.
Use of artificial intelligence
AI-assisted tools were used only for language editing and formatting. Clinical data, interpretation, and final content were reviewed and approved by the authors. No AI tool was used for medical decision-making.

Authors' contributions
Peter Mattew George conceived the report, provided clinical care, collected data, and drafted the manuscript. Arda Işık supervised the work and critically revised the manuscript. Both authors approved the final version and agree to be accountable for all aspects of the work.

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TABLES

Table 2. Complete blood count at admission

Parameter	Value	Unit	Reference	Flag
White-cell count	3.91	× 10^9/L	4.00–10.00	Low
Lymphocytes (absolute)	1.22	× 10^9/L	0.80–4.00	Normal
Mid cells (absolute)	0.88	× 10^9/L	0.10–1.80	Normal
Granulocytes (absolute)	1.81	× 10^9/L	2.00–7.80	Low
Lymphocytes	31.2	%	20.0–40.0	Normal

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Mid cells	22.6	%	1.0–15.0	High
Granulocytes	46.2	%	50.0–70.0	Low
Red-cell count	4.42	× 10^{12}/L	3.50–5.00	Normal
Hemoglobin	131	g/L	110–150	Normal
Hematocrit	0.417	fraction	0.370–0.470	Normal
MCV	86.6	fL	80.0–100.0	Normal
MCH	27.3	pg	27.0–34.0	Normal
MCHC	315	g/L	320–360	Low
RDW-CV	14.3	%	11.0–16.0	Normal
Platelet count	334	× 10^{9}/L	100–300	High
Mean platelet volume	9.9	fL	6.5–12.0	Normal
Plateletcrit	3.32	mL/L	1.08–2.82	High

Mild leukopenia and a platelet count above the local reference interval were noted. Mechanisms were not established; the counts informed the decision to avoid thionamides.

Table 3. Thyroid function tests at admission

Parameter	Value	Unit	Reference	Interpretation
TSH	0.39	mIU/L	0.30–4.20	Within reference (near lower limit); not suppressed
Total T3	4.46	nmol/L	1.23–3.07	Elevated
Total T4	189.55	nmol/L	66.00–181.00	Elevated
Free T3 / free T4	Not measured	—	—	Unavailable
TBG / interference studies	Not performed	—	—	Unavailable

Discordant pattern: elevated total thyroid hormones with non-suppressed TSH. Cause not confirmed.

Figure 1.

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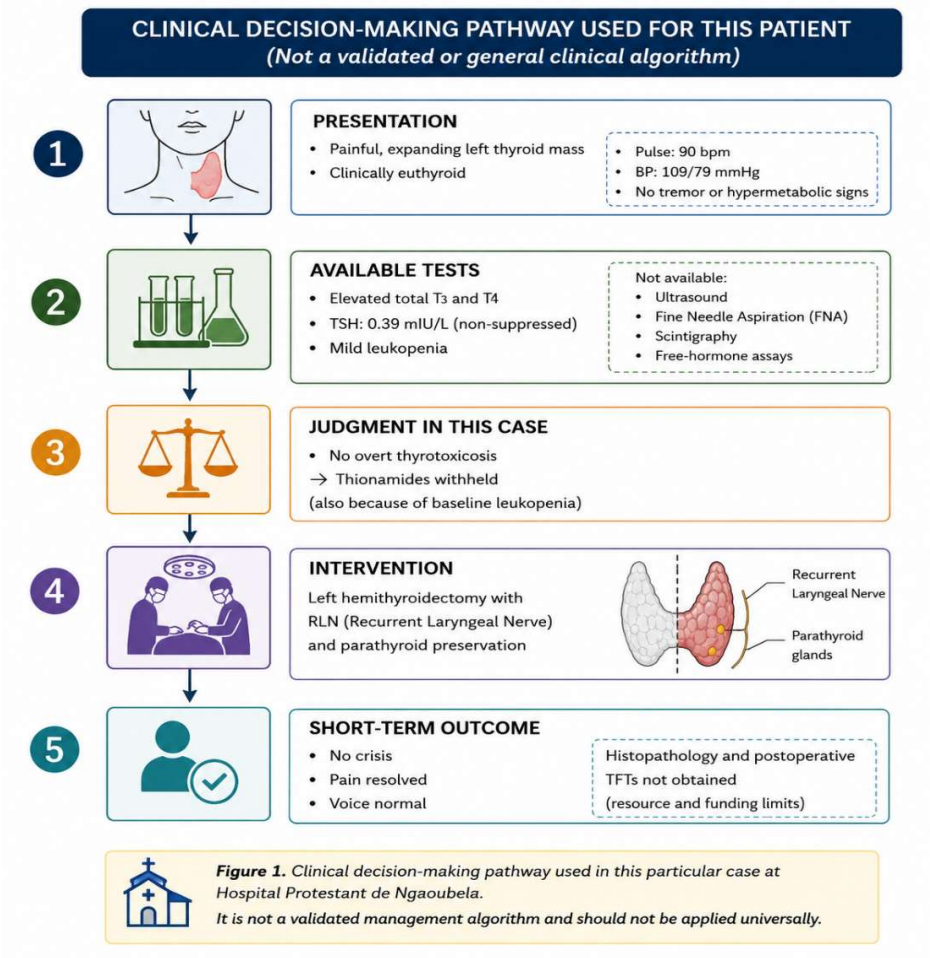

Figure 1. *Clinical decision-making pathway used in this particular case at Hospital Protestant de Ngaoubela.*
It is not a validated management algorithm and should not be applied universally.

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