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Unexpected Diagnosis of an Intraoperative Riedel's Thyroiditis and Analysis of Current Data

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Abstract

Background: Riedel's thyroiditis is a rare form of chronic inflammatory disease affecting the thyroid gland. It is characterised by the replacement of the thyroid parenchyma by fibrous tissue. It also affects the adjacent vital structures. Due to its characteristic presentations, Riedel's thyroiditis may not be immediately diagnosed. **Objectives:** Through this clinical case, we aimed to describe the pathology and clinical characteristics of Riedel's thyroiditis and the diagnostic, therapeutic, and progressive modalities. **Methods:** A 62-year-old woman with no particular pathological history is consulted at the outpatient clinic for anterior cervical swelling that has been present for more than 5 years and is associated with respiratory discomfort and dysphagia to solids. Clinical examination, ultrasound, lab tests and injected cervical computed tomography (CT) were performed. These tests were completed with pathological examination. **Results:** General conditions were normal. Anterior cervical swelling, marked on the right, of hard consistency, causing cervical shielding with healthy surrounding skin, was observed at the examination. A compressive goitre was first suspected. Thyroid tests showed hypothyroidism. The CT revealed a hypodense goitre with micro-calcifications developed at the expense of the right lobe and exerting a mass effect on the trachea and oesophagus. Aspiration thyroid was not conclusive given the suspicion of the malignant nature of the goitre, and the decision to perform a right loboisthmectomy was taken. Pathological examination of the biopsy showed atrophy of the thyroid parenchyma with dense septal fibrosis punctuated by lymphocytes and extending throughout the tissue associated with inflammation—an appearance in favour of Riedel's thyroiditis. The patient was treated with Levothyroxine and corticoids. **Conclusions:** This case points out the challenges in diagnosing Riedel's Thyroiditis and the complexity of the pathology that

requires a rigorous diagnostic approach and appropriate treatment for the best outcome.

Keywords

Riedel's Thyroiditis, Diagnostic Challenges, Hypothyroidism, Compressive Symptoms, Anapathology, Djibouti

1. Introduction

Riedel's thyroiditis, also known as Riedel Struma, Morbus Riedel, or Riedel goiter, is a sporadic form of chronic thyroiditis. It is a fibrosclerotic disease affecting the thyroid gland characterized by the replacement of the thyroid parenchyma by fibrous tissue. This fibrosis affects the parenchyma and the cervical tissues surrounding the thyroid gland [1]-[3]. It was described for the first time in 1886 in Germany by Bernhard Riedel through two observations. He described it as an "eisenharte Struma" (iron hard goitre) fixed and usually painless enlargement of the thyroid, a particularly hard and infiltrative lesion of the thyroid gland [4]-[6]. This fibrous damage is not limited to the thyroid only but invades the surrounding vital structures, such as the vessels of the neck, the nerves, the trachea, the oesophagus, and the parathyroid, which leads to compressive symptoms and endocrine abnormalities [4]-[8]. The etiopathogenesis of this pathology is still unknown, although it is caused by autoimmune mechanisms linked to inflammation, which lead to fibrosis [3] [7]-[9]. The presence of anti-thyroid antibodies, eosinophilic infiltrate, and response to glucocorticoid therapy suggest autoimmune pathology [9] [10]. Because it is rare, it can mimic other thyroid pathologies, complicating the diagnosis and treatment [9]. Indeed, Riedel thyroiditis must be differentiated from other masses in the anterior neck, which can infiltrate the surrounding extra-thyroidal tissues, namely anaplastic thyroid carcinoma, thyroid lymphoma, and thyroid sarcoma [11]. Other differential diagnoses include the fibrosing variant of Hashimoto thyroiditis [10]. The incidence among the various thyropathies varies depending on the series between 0.04% and 0.3%, explained by the fact that publications concerning Riedel's thyroiditis are often limited to case reports in the literature. Women are 4 to 5 times more affected than men, with the average age at diagnosis varying between 30 and 50 years [10]-[12]. Riedel's thyroiditis has not yet been reported in Djibouti's literature.

This article presents the first case of a 62-year-old woman with clinical features initially suggestive of compressive goitre, which turned out to be Riedel's thyroiditis.

2. Case Report

A 62-year-old female with no particular pathological history is seen at the outpatient clinic for anterior cervical swelling that has been present for more than 5 years and is associated with respiratory discomfort and dysphagia to solids.

Examination at the consultation found the patient in good general condition. The integuments and conjunctivae were well-coloured. The general parameters were: temperature: 37˚C; pulse: 78 BPM; Blood Pressure: 10/07; SaO_2: 99% in ambient air. We noted an anterior cervical swelling, marked on the right, that was not painful and of hard consistency, causing cervical shielding (not mobile when swallowing) with healthy surrounding skin. Given the patient's significant gag reflex, the nasofibroscopy performed during the day was inconclusive. Furthermore, the rest of the ENT examination was regular. At the end of the clinical examination, the diagnosis of a compressive goitre was suspected. We completed additional examinations, notably the cervical ultrasound, which showed a goitre developed at the expense of the right lobe of the thyroid, containing a hypoechoic nodule that occupied the entire right lobe.

Thyroid tests showed hypothyroidism, with TSH-us at 47 mIU/ml (Reference = 0.25 to 5), anti-thyroglobulin antibody (ATg) at 777 IU/ml (Reference = 0 to 95); and anti-thyroperoxidase antibody (Anti-TPO) at 680 IU/ml (Reference = 0 to 30 IU/ml).

The injected cervical computed tomography (CT) performed the same day as an emergency revealed a hypodense goitre with micro-calcifications developed at the expense of the right lobe and exerting a mass effect on the trachea and oesophagus (Figure 1).

The thyroid aspiration was inconclusive given the suspicion of the malignant nature of the goitre. The decision to perform a right loboisthmectomy was taken to relieve the compression. Intraoperatively, the thyroid gland was hard and fibrosed, inextricably adhering to the larynx, the trachea, the vascular axis of the neck on the right, and the subhyoid muscles. An orange quarter biopsy was performed. Pathological examination of the biopsy showed atrophy of the thyroid parenchyma with dense septal fibrosis punctuated by lymphocytes and extending throughout the tissue associated with inflammation. The appearance was in favour of Riedel's thyroiditis (Figure 2).

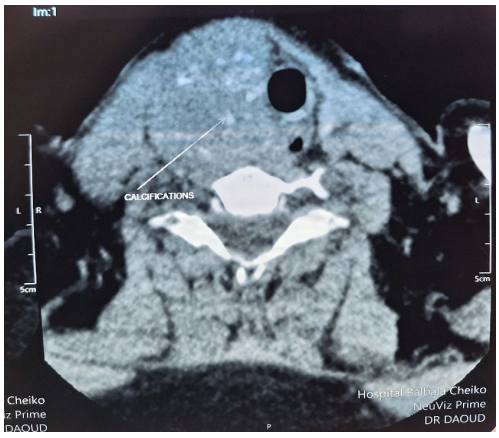

Figure 1. Axial section of the CT scan showing the right lobe of the hypertrophied thyroid with intra-parenchymal micro-calcifications exerting a mass effect on the trachea and oesophagus.

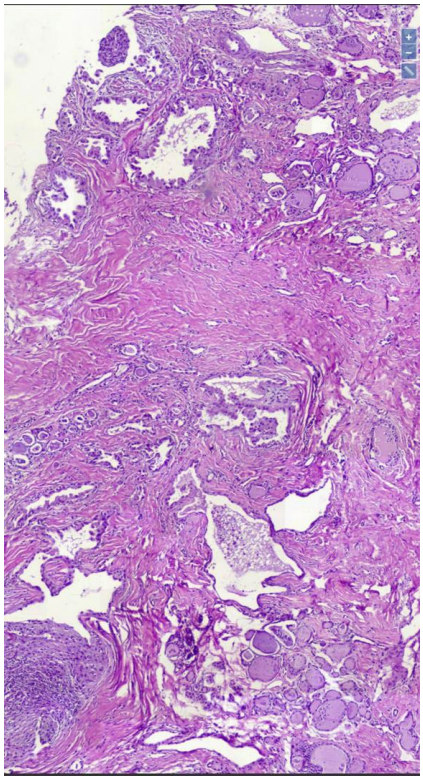

Figure 2. Microscopic appearance (H&E ×40) showing atrophy of the thyroid parenchyma with dense fibrosis extending throughout the tissue associated with inflammation.

The patient was referred to the endocrinology department, where she was put on levothyroxine and corticosteroid therapy. The evolution was favourable with a reduction in the goitre size and the disappearance of the signs of compression.

3. Discussion

Riedel's thyroiditis is a very rare pathology. Despite uncertainty regarding the underlying etiological mechanisms, the prevailing opinion is that it is considered a component of a generalised fibro-inflammatory process that also affects other organs. Clinically, the symptoms of Riedel's thyroiditis are polymorphous and can vary from one patient to another [8]. Several clinical signs are frequently observed but goitre is the most often clinical sign noticed which can be very firm in consistency, woody or stony and painless [1]-[3]. Secondarily, diffuse, extensive, and fixed hypertrophy may be adherent to surrounding structures and be responsible for the mobility's disappearance during swallowing manoeuvres. It is from this moment that compressive signs appear, notably dysphagia and dyspnoea. In terms of symptomatic presentation, Fatourechi *et al* noted narrowing of the trachea (48%), dysphagia (33%), vocal cord paralysis (29%), and pain (24%) [10]. Riedel's thyroiditis has no pathognomonic characteristics; it can mimic other thyroid pathologies. Clinical differentiation between Riedel's thyroiditis and thyroid cancer is difficult for practitioners because clinical examination and imaging of Riedel's thyroiditis often indicate a strong suspicion of malignancy [11]. Anaplastic

carcinoma is an undifferentiated malignant tumour that can usually clinically mimic Reidel's thyroiditis with dysphagia or tracheal compression symptoms. However, in the case of Reidel's thyroiditis, biopsy or fine needle aspiration shows no malignant cells. Also, another difference with Riedel's thyroid is that the carcinoma affects individuals over the age of 70 - 80, while patients with Reidel's thyroiditis are women between 30 and 50 years [10]-[12].

For our patient, who falls into the gender and age category of patients affected by this disease, the cardinal symptoms were primarily respiratory due to the goitre's extrinsic compression of the airways. Hypothyroidism may be observed in the Riedel's thyroiditis [8]. On a biological level, most patients with Riedel's thyroiditis are euthyroid, but 30% of cases may have hypothyroidism or rarely thyrotoxicosis [13]-[17]. This hypothyroidism is due to diffuse infiltration of the gland by fibrosis and functional inhibition linked to possible autoimmune involvement [16]. In our case, primary thyroid lymphoma, Hashimoto's thyroiditis, and anaplastic carcinoma were part of our first differential diagnoses, given the initial presentation of our patient with a hard and fixed thyroid mass, leading to laryngeal dyspnoea due to extrinsic compression, a notion also of dysphagia to solids and the presence of hypothyroidism [18].

Given the absence of pathognomonic clinical and biological signs of Riedel's thyroiditis, the use of imaging is important to establish the diagnosis [8] [19] [20]. Ultrasound can show a hypoechoic thyroid, enlarged, with irregular contours, often with areas of fibrosis. Computed tomography (CT) helps evaluate the extension of fibrosis and its impact on surrounding structures [8]. It shows a dense and hypodense thyroid, with signs of compression of adjacent tissues. Magnetic resonance imaging (MRI) can be used to assess fibrosis and compression of cervical structures [8] [21]. It provides information on the extent of fibrotic infiltration. Other imaging modalities have been described, including positron emission tomography using fluorodeoxyglucose (PET-Scan), which shows areas of increased metabolism [22] [23]. This modality can be used to monitor disease activity. All these various imaging modalities, including ultrasound, CT, MRI, and PET, can be performed to diagnose Riedel's thyroiditis. However, they may not be helpful for the definitive diagnosis of Riedel's thyroiditis and the differentiation with a malignant thyroid tumour. The precise diagnosis of Riedel's thyroiditis always remains histological [8]. It is based on surgical biopsy to eliminate the hypothesis of a malignant lesion and differentiate it from the sclerosing form of Hashimoto's thyroiditis, where T lymphocytes predominate.

Thyroid aspiration cytology, or fine needle aspiration (FNA), is part of the first-line diagnostic modality for thyroid lesions. In the case of Riedel's thyroiditis, FNA may show inflammatory cells and signs of fibrosis. However, it may not be conclusive in establishing a definitive diagnosis [24]. It is difficult for pathologists and radiologists to diagnose Riedel's thyroiditis and exclude malignancy, as shown in our case where FNA was inconclusive [24]. For our patient also, the definitive diagnosis was made by histopathology, from an open biopsy after goitre decom-

pressive surgery performed for clinical symptoms.

Microscopically, the normal thyroid parenchyma was replaced by abundant collagen fibres, which took on the appearance of keloid bands (**Figure 2**). An inflammatory infiltrate composed primarily of lymphocytes and plasma cells was likewise seen as in Riedel's thyroiditis. Therapeutically, due to its low incidence, there are no guidelines or large cohort clinical studies that refer to the optimal management of the disease. Although Fatourechi *et al.* [10] reported 21 cases over 32 years in their studies, published data on Riedel's thyroiditis are limited to case reports, the largest reported series of which included only 6 patients [25]. This makes it difficult to standardise and establish clear treatment criteria. Most authors agree that treatment should aim to treat hypothyroidism in people who suffer from it and to manage the manifestations linked to fibrosis, which can put the patient's life at risk [25].

For this, there are several therapeutic approaches, including systemic corticosteroid therapy, which is described as a first-line therapeutic choice [2] [20]. It reduces fibrogenic cytokines (TNFa, IL1b, TGFb) and most often stabilises the disease, with an improvement in compressive signs and a more or less complete regression of fibro-inflammatory lesions. However, if corticosteroid therapy fails or after decompression surgery, Tamoxifen is another agent used in the treatment of Riedel's thyroiditis [23] [27]. It would give a good result with a significant reduction in goitre volume in patients who previously did not respond to steroids. Surgical intervention is indicated in patients with compressive symptoms. It remains recommended for symptomatic purposes (tracheal or oesophageal compression) and to relieve the compression (isthmectomy in the event of tracheal compression). It is carried out at the same time as the surgical biopsy. Surgery is not indicated for curative purposes, except exceptionally at a very early, non-extensive stage of the disease [8] [15] [28].

In our case, a right loboisthmectomy was performed to relieve the compression, and a combination of levothyroxine used to treat hypothyroidism with corticoid therapy to reduce inflammation permitted the patient to gain recovery.

4. Conclusion

Riedel's thyroiditis is a rare but complex pathology that requires a rigorous diagnostic approach and appropriate treatment. Early recognition of clinical signs and an appropriate diagnostic approach are essential to improve clinical outcomes. Corticosteroids remain the treatment of choice, but a surgical approach may be necessary in some cases. Regular monitoring is crucial to manage this disease and its potential complications.

Information and Informed Consent from Patients

The patient was informed of the authors' interest in publishing her clinical case. She voluntarily agreed to let us use the contents of her file for this case report.

Conflicts of Interest

The authors declare that they have no links of interest.

References

[1] Crile, G. (1948) Thyroiditis. *Annals of Surgery*, **127**, 640-654. https://doi.org/10.1097/00000658-194804000-00005

[2] Hennessey, J.V. (2011) Riedel's Thyroiditis: A Clinical Review. *The Journal of Clinical Endocrinology & Metabolism*, **96**, 3031-3041. https://doi.org/10.1210/jc.2011-0617

[3] Zimmermann-Belsing, T. and Feldt-Rasmussen, U. (1994) Riedel's Thyroiditis: An Autoimmune or Primary Fibrotic Disease? *Journal of Internal Medicine*, **235**, 271-274. https://doi.org/10.1111/j.1365-2796.1994.tb01071.x

[4] Riedel, B.M. (1896) Die chronische, zur Bildung eisenharter Tumoren fuhrende Entzundung der Schilddruse. *Verhandlungen der deutschen Gesellschaft für Chirurgie*, **25**, 101-105.

[5] Riedel, B.M. (1896) Vorstellung eines Kranken mit chronischer Strumitis. *Verhandlungen der deutschen Gesellschaft für Chirurgie*, **26**, 127-129.

[6] Riedel, B.M. (1910) Ueber Verlauf und Ausgang der chronischer Strumitis. *Munchener Medizinische Wochenschrift*, **57**, 1946-1947.

[7] Majety, P. and Hennessey, J.V. (2022) Acute and Subacute, and Riedel's Thyroiditis. Division of Endocrinology, Diabetes and Metabolism, Beth Israel Deaconess Medical Center, Harvard Medical School. https://www.ncbi.nlm.nih.gov/books/NBK285553/

[8] Czarnywojtek, A., Pietrończyk, K., Thompson, L.D.R., Triantafyllou, A., Florek, E., Sawicka-Gutaj, N., *et al.* (2023) IGG4-Related Sclerosing Thyroiditis (Riedel-Struma): A Review of Clinicopathological Features and Management. *Virchows Archiv*, **483**, 133-144. https://doi.org/10.1007/s00428-023-03561-2

[9] Heufelder, A.E. and Hay, I.D. (1994) Evidence for Autoimmune Mechanisms in the Evolution of Invasive Fibrous Thyroiditis (Riedel's Struma). *The Clinical Investigator*, **72**, 788-793. https://doi.org/10.1007/bf00180548

[10] Fatourechi, M.M., Hay, I.D., McIver, B., Sebo, T.J. and Fatourechi, V. (2011) Invasive Fibrous Thyroiditis (Riedel Thyroiditis): The Mayo Clinic Experience, 1976-2008. *Thyroid*, **21**, 765-772. https://doi.org/10.1089/thy.2010.0453

[11] Shiva Kumar, Y.G., Minhthao, N. and Vishnu, V.G. (2024) Riedel Thyroiditis. StatPearls Publishing LLC.

[12] Hay, I.D. (1985) Thyroiditis: A Clinical Update. *Mayo Clinic Proceedings*, **60**, 836-843. https://doi.org/10.1016/s0025-6196(12)64789-2

[13] Chopra, D., Wool, M.S., Crosson, A. and Sawin, C.T. (1978) Riedel's Struma Associated with Subacute Thyroiditis, Hypothyroidism, and Hypoparathyroidism. *The Journal of Clinical Endocrinology & Metabolism*, **46**, 869-871. https://doi.org/10.1210/jcem-46-6-869

[14] Shafi, A.A., Saad, N.B. and AlHarthi, B. (2020) Riedel's Thyroiditis as a Diagnostic Dilemma—A Case Report and Review of the Literature. *Annals of Medicine and Surgery*, **52**, 5-9. https://doi.org/10.1016/j.amsu.2020.02.006

[15] Blanco, V.M., Páez, C.A., Victoria, A.M., Arango, L.G., Arrunategui, A.M., Escobar, J., *et al.* (2019) Riedel's Thyroiditis: Report of Two Cases and Literature Review. *Case Reports in Endocrinology*, **2019**, Article ID: 5130106. https://doi.org/10.1155/2019/5130106

[16] Marín, F., Araujo, R., Páramo, C., Lucas, T. and Salto, L. (1989) Riedel's Thyroiditis Associated with Hypothyroidism and Hypoparathyroidism. *Postgraduate Medical Journal*, **65**, 381-383. https://doi.org/10.1136/pgmj.65.764.381

[17] Lo, J.C., Loh, K., Rubin, A.L., Cha, I. and Greenspan, F.S. (1998) Riedel's Thyroiditis Presenting with Hypothyroidism and Hypoparathyroidism: Dramatic Response to Glucocorticoid and Thyroxine Therapy. *Clinical Endocrinology*, **48**, 815-818. https://doi.org/10.1046/j.1365-2265.1998.00449.x

[18] hakeem, A.H., Chandramathyamma, S.K., Hakeem, I.H., Wani, F.J. and Gomez, R. (2016) Riedel's Thyroiditis Mimicking as Anaplastic Thyroid Carcinoma: Unusual Presentation. *Indian Journal of Surgical Oncology*, **7**, 359-362. https://doi.org/10.1007/s13193-016-0513-5

[19] Guia Lopes, M.L., Cidade, J.P., Cunha, C., Limbert, C. and Sequeira Duarte, J. (2024) Life-Threatening Airway Obstruction by Riedel's Thyroiditis: A Rare Presentation and Diagnostic Dilemma. *Endocrinology, Diabetes & Metabolism Case Reports*, **2024**, Article No. 24-0053. https://doi.org/10.1530/edm-24-0053

[20] Darouichi, M. and Constanthin, P.E. (2016) Riedel's Thyroiditis. *Radiology Case Reports*, **11**, 175-177. https://doi.org/10.1016/j.radcr.2016.05.017

[21] Ozgen, A. and Cila, A. (2000) Riedel's Thyroiditis in Multifocal Fibro Sclerosis: CT and MR Imaging Findings. *American Journal of Neuroradiology*, **21**, 320-321.

[22] Kotilainen, P., Airas, L., Kojo, T., Kurki, T., Kataja, K., Minn, H., *et al.* (2004) Positron Emission Tomography as an Aid in the Diagnosis and Follow-Up of Riedel's Thyroiditis. *European Journal of Internal Medicine*, **15**, 186-189. https://doi.org/10.1016/j.ejim.2004.03.002

[23] Lauwyck, J.Y., Van Walleghem, L.P. and De Geeter, F. (2015) IgG4-Related Disease: The Utility of (18) F-FDG PET/CT in Diagnosis and Treatment. *Hellenic Journal of Nuclear Medicine*, **18**, 155-159.

[24] Kumar, N., Gupta, R., Sayed, S., Moloo, Z., Vinayak, S. and Ahmed, M. (2018) Difficulties in Diagnosis of Riedel's Thyroiditis on Aspiration Cytology: A Case Report and Brief Review of the Literature. *Diagnostic Cytopathology*, **47**, 512-516. https://doi.org/10.1002/dc.24130

[25] Falhammar, H., Juhlin, C.C., Barner, C., Catrina, S., Karefylakis, C. and Calissendorff, J. (2018) Riedel's Thyroiditis: Clinical Presentation, Treatment and Outcomes. *Endocrine*, **60**, 185-192. https://doi.org/10.1007/s12020-018-1526-3

[26] De, M., Jaap, A. and Dempster, J. (2001) Tamoxifen Therapy in Steroid Resistant Reidel's Thyroiditis. *Scottish Medical Journal*, **46**, 56-57. https://doi.org/10.1177/003693300104600211

[27] Wang, C., Wu, T., Lee, C. and Huang, S. (2012) A Misdiagnosed Riedel's Thyroiditis Successfully Treated by Thyroidectomy and Tamoxifen. *Journal of the Formosan Medical Association*, **111**, 719-723. https://doi.org/10.1016/j.jfma.2012.07.012

[28] Navarro-Sánchez, V., Marín-Castañeda, L.A., Gallegos, C.A., Quiroz, O. and Ahumada-Ayala, M. (2020) Igg4-Related Fibrous Thyroiditis (Riedel's Thyroiditis): A Case Report. *American Journal of Case Reports*, **21**, e928046. https://doi.org/10.12659/ajcr.928046