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Ultrasonography in diagnosis of amyloidosis of thyroid gland: Rare case

Rania Mohammed Ahmed✉

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Author Affiliation:
Associate prof, Radiological Sciences Department, Applied Medical College, Taif University. Saudi Arabia.

✉**Corresponding author**
Dr. Rania Mohammed Ahmed;
Email: rania_awad1@hotmail.com

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ABSTRACT

Introduction: Amyloid goiter is a very rare manifestation of amyloidosis, can occur as a result of either primary or secondary amyloidosis of unknown etiology, leading in an increase in the size of the thyroid gland and compressive symptoms, depending on deposit location and severity. *Case presentation*: We report a case of 17-year-old patient who came with a one year history of enlarging painless neck and face swelling, presented to the Endocrine department in Tadawi international Poly Clinics in Abha City, Aseer Area, South of Kingdom Saudi Arabia. An enlarged thyroid gland with mediastinal involvement was discovered on ultrasound. The patient was diagnosed with primary amyloidosis involving only the thyroid gland, which was confirmed by histopathology. The multinodular appearance was compatible with a diagnosis of multinodular goiter. *Discussion and conclusion*: Amyloid Goiter is an extremely uncommon condition. Many previous studies revealed that a strong index of suspicion is expected in individuals with enlarged thyroid glands and a history of persistent inflammatory processes or plasma cell disorders. Fine needle aspiration cytology/biopsy (FNAC/B) should be undertaken to rule out thyroid cancer. Thyroidectomy is required for a variety of reasons; such as confirmed diagnosis cases.

Keywords: Amyloidosis, Thyroid, Ultrasound, Male, Goiter, KSA

1. INTRODUCTION

Amyloidosis is considered as systemic disorder of unknown etiology, the pathophysiological process is caused by deposition of amyloid fibrils in tissues of the thyroid gland (Ritchi, 1990). Amyloid goiter (AG) also AG is characterized by the diffuse enlargement of the thyroid gland caused by extensive amyloid deposits. U/S findings in AG can vary depending on the amount of amyloid and fat deposits present. A few cases have been reported involving AG with clinically subacute symptoms (Yoo et al., 2018).

Amyloidosis is a systemic disease with profound effects on organ function. However, despite the broad array of disease manifestations, the effect of amyloidosis on thyroid function is underreported (Eli et al., 2016). Minor amyloid infiltration of the thyroid gland is found in 50-80% of cases of generalized amyloidosis, the induction of a goiter by amyloid invasion is rare

(Hatabu et al., 1990). A thyroid gland with amyloidosis may show an enlargement of both or one of its lobes, a homogeneous echotexture similar to that of ground glass, and a very high echogenicity, similar to that of the surrounding connective tissue, also may show the thyroid gland is dilated with enlarged follicles. The other patients can have normal ultrasound findings; sonographically can show multiple hyperechoic solid lesions and cysts in the enlarged thyroid gland (Hatabu et al., 1990; el-Reshaid et al., 1994).

Fat and amyloid deposits can affect imaging findings; however, the more common imaging finding is diffuse thyroid fatty infiltration (Selim et al., 2017). Indeed in spite of the fact that inclusion of the thyroid organ by amyloid is quite common, clinically noteworthy broadening of the thyroid due to amyloid deposition is amazingly uncommon, and most cases are not analyzed prior to surgery (Yidiz et al., 2009). This case report was reported in line with the SCARE criteria (Agha et al., 2018).

2. CASE STUDY

A 17 years old male, with previous history of swelling of face, neck and legs, presented to the Endocrine department in Tadawi international Poly Clinics in Abha City, Aseer Area, South of Kingdom Saudi Arabia. The patient was diagnosed with both nephritic syndrome, and hypothyroidism. He came with blood pressure 150/90mm/Hg, and albuminuria, hyperlipidemia, hypoalbuminemia, and edema offace, neck, and legs. Review of other systems revealed no other symptoms. On physical examination a swelling was noted in the anterior aspect of the neck; the patient neck mass revealed a bilateral, non-tender, firm, multi-nodular swelling, slight retrosternal extension was present. No skin changes were noticed. Thyroid function tests were normal after a transient period of hypothyroidism.

Ultrasound (U/S) scan was done to the patient forwhole neck. U/S of thyroid gland revealed that, thyroid gland was diffusely enlarged, heterogeneous, with increased echogenicity. As in (Figure 1), both parotid glands, and submandibular glands are enlarged, heterogeneous, with increased echogenicity. Other findings were multiple enlarged, hyperechoic lymph nodes, with kidney shape are seen in the submandibular region and deep cervical regions, bilaterally. Fine needle aspiration cytology showed that there was abundant adipose tissue in the thyroid fibrillar protein type of tissue; this mass appears benign with clusters of benign epithelial cells, some in follicular patterns that resemble thyroid tissue. The accuracy of FNA for detecting amyloid in thyroid tissue is lower than that of histopathology, though it is a safe and quick diagnostic tool.

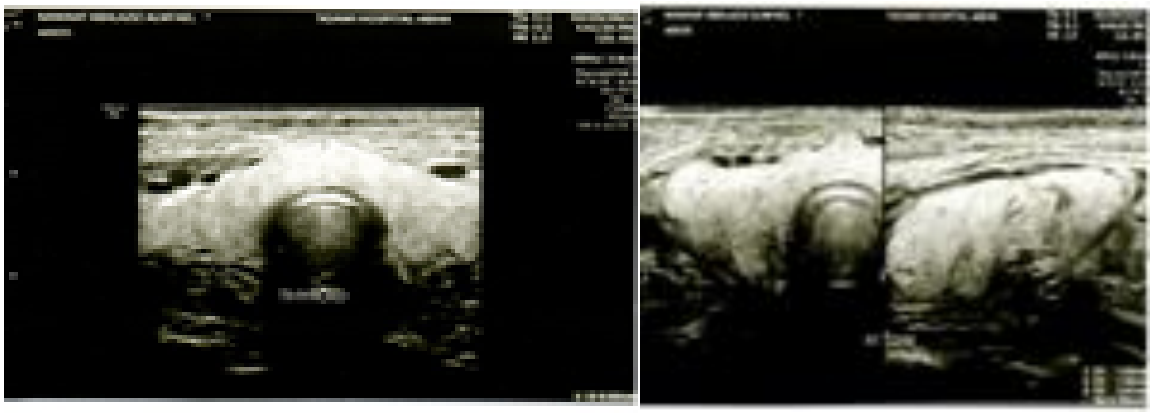

Figure 1 Ultrasound images of thyroid gland of 17 year-old male complaining of neck and face swelling, showed diffusely enlarged thyroid gland with heterogeneous increased echogenicity of thyroid tissue.

3. DISCUSSION

Amyloidosis is a term used to describe a group of disorders caused by the abnormal buildup of an insoluble protein called amyloid (Orrego & Chorny, 2019). Amyloidosis results of deposition of fibrillar protein consisting of the light chain of immunoglobulin with the lambda type accounting for 75% of all cases (Linge et al., 2017). Small amount of amyloid deposits do not cause any symptoms and hence go undetected. 30 to 80 % of the subjects may have thyroid involvement not leading to any clinical symptoms (Karuna et al., 2016).

The majority of people with amyloid goiters have a rapid onset of symptoms. Over a period of time, the development of a hard, non-tender neck mass a period of time ranging from a few weeks to a few years dysphagia, dysphonia, and dyspnea are all symptoms of dysphagia. The enlargement is usually widespread and bilateral, although it can also be asymmetrical and nodular. Despite the fact that; some people may appear hypothyroidism or hyperthyroidism, either clinically or biochemically. The majority

of patients are thyroid-free (Law et al., 2013; Hamed et al., 1995). Amyloid goiter is most commonly caused by serum amyloid in under developed nations. A form of amyloidosis occurs frequently in the context of familial Mediterranean fever (Yidiz et al., 2009).

Amyloid goiter is most commonly caused by serum amyloid in underdeveloped nations. Irritable bowel illness, rheumatoid arthritis, and bronchiectasis are all examples of amyloidosis (Kazdaghli et al., 2010; Goldsmith et al., 2000). Thyroid deposition of amyloid is very frequent, estimated between 20% and 50% of primary amyloidosis and up to 80% in secondary amyloidosis. Hypothyroidism or hyperthyroidisms are both possible diagnoses and euthyroid (Augusto et al., 2013; Jaques et al., 2013). Fat and amyloid deposits within the thyroid tissue can affect the imaging characteristics of amyloid goiter. Mixed echogenicity or hypoechogenic masses are seen on sonography in situations of amyloid accumulation (Aksu et al., 2010). The duration of the clinical history varies from four months to three years. The hypertrophy of the thyroid gland can be unilateral or bilateral. The gland has a firm to hard firmness, yet it can be soft in some situations. There will be considerable intercellular amyloid deposition on histopathology, as well as thyroid follicles bordered by atrophic epithelium, filled with colloid, and fatty metaplasia (Sethi et al., 2011).

Thyroid ultrasound and computed tomography showed diffuse or nodular goiter with no specific features (Yidiz et al., 2009). There is currently no viable treatment for systemic amyloidosis. In familial Mediterranean fever, colchicine may prevent amyloid deposition (Amado et al., 1982). Total thyroidectomy is the therapy of choice for patients with amyloid goiter who are experiencing compressive symptoms. The surgical specimen is histologically examined to determine the final diagnosis (Cannizzaro et al., 2018).

4. CONCLUSION

This case is presented because of its clinical significance. Enlargement of thyroid may be a manifestation of underlying amyloidosis and may mimic goiter, so proper investigations should be done with special emphasis on histopathology, special stains and radiological imaging studies. Definitive diagnosis typically occurs after thyroidectomy and histological analysis. Every exertion ought to be made to confine the degree of the infection, and amyloid goiter ought to be included within the differential conclusion of extended goiter.

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Informed consent

Written & Oral informed consent was obtained from participant included in the study.

Conflicts of interest

The authors declare that they have no conflict of interest.

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Data and materials availability

All data associated with this study are present in the paper.

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