

## A Rare Case of Graves' Dermopathy in The Covid-19 Pandemic

Giacomo Accardo<sup>1\*</sup>, Rosa di Fraia<sup>2</sup>, Lucia Digitale Selvaggio<sup>2</sup>, Francesca Allosso<sup>2</sup> and Daniela Pasquali<sup>2</sup>

<sup>1</sup>Azienda Sanitaria Locale Napoli 3 Sud, Assistenza Sanitaria di Base Endocrinologia, Italy

<sup>2</sup>Department of Advanced Medical and Surgical Sciences, University of Campania "Luigi Vanvitelli", Naples, Italy

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### Corresponding author:

Giacomo Accardo,  
Azienda Sanitaria Locale Napoli 3 Sud,  
Assistenza Sanitaria di Base  
Endocrinologia, 80058 Torre Annunziata,  
Naples, Italy, Tel: +390815352547;  
Email: giacomo.accardo@unicampania.it

### ABSTRACT

A man aged 27 with an history of persistent hyperthyroidism didn't have total thyroidectomy for the delay of the procedure during COVID-19 pandemic. This delay, in addition to the persistence of hyperthyroidism, caused the development of pretibial oedema of both legs suggesting thyroid dermopathy treated with oral prednisone.

### INTRODUCTION

Coronavirus is a respiratory disease that is spreading worldwide. The severity and risk of death are important in the elderly, those with comorbidities, and immunosuppressed patients. The outbreak of a pandemic has created significant barriers to the diagnosis, treatment, and monitoring of chronic disease. The provision of regular, planned comprehensive care for chronic patients has been disrupted due to medical facility closures, lack of public transportation, or reduced services. This allowed us to identify rare conditions that would not normally appear [1,2]. Graves' disease is the most common cause of hyperthyroidism in iodine-deficient areas, with an incidence of 21 cases per 100,000 people per year [3,4]. In addition to the signs and symptoms of hyperthyroidism, Graves' disease can also include Graves' orbitopathy disease (GO), thyroid dermopathy (or pretibial myxoma) (PTM), and thyroid acropathy [5,6]. Graves' hyperthyroidism is treated by reducing thyroid hormones synthesis, using anti thyroid drugs (ATD), or by reducing the amount of thyroid tissue with RAI treatment or total thyroidectomy [3,4]. Rarely, people with Graves' disease develop Graves' dermopathy. This is a condition of the skin that is characterized by red, swollen skin, usually on the shins and tips of the feet. There are similarities between the histological features and pathogenesis of GO and PTM [5]. In both cases, glycosaminoglycan and mucin substances accumulate [5]. In both cases, fibroblast proliferation is observed. However, in dermopathy, lymphocyte proliferation is less pronounced. The onset of thyroid dermopathy occurs on average 12-24 months after diagnosis of thyrotoxicosis following GO, but in some cases, it can occur many years after diagnosis of hyperthyroidism [5,6]. Treatment of Graves' dermopathy is usually aimed at correcting the overactive thyroid function in Graves' disease. Quit smoking and avoid trauma to the skin is recommended. Cortisone creams are used to reduce inflammation [4,5].

### CASE PRESENTATION

In May 2020, a 27-year-old man reported an history of persistently high TSH-R-Abs and persistent hyperthyroidism, after more than 24 months of therapy with methimazole. Laboratory studies showed a thyrotropin level of 0,009 µU per milliliter

(reference range, 0.40 to 3.80  $\mu\text{U/ml}$ ), a free triiodothyronine level of 9.93 ng per deciliter (reference range, 0.26 to 0.44 ng/dl), and a free thyroxine level of 2.33 ng per deciliter (reference range, 0.9 to 1.6 ng/dl). He had been referred to surgeon for total thyroidectomy. In May 2021 he was still waiting for surgical procedure to be performed, due to the blocking of the operating rooms during the lockdown, and he returned to the endocrinologist complaining of palpitations and trembling. He was on methimazole treatment, and the laboratory findings evidenced a thyrotropin level of 0,009  $\mu\text{U}$  per milliliter (reference range, 0.40 to 3.80  $\mu\text{U/ml}$ ), a free triiodothyronine level of 15.9 ng per deciliter (reference range, 0.26 to 0.44 ng/dl), and a free thyroxine level of 3.41 ng per deciliter (reference range, 0.9 to 1.6 ng/dl) and elevated levels of thyrotropin-receptor antibodies (118 IU per liter [reference value, <1.0 IU/l]). On examination, he had lesions symmetrical in the lower extremity with an appearance like orange skin, with nonpitting edema on the pretibial region of the right and left legs (Figure 1, Panel A and B respectively) with soft tissue swelling leading to diagnosis of thyroid dermopathy. No signs and symptoms of GO. He had consulted a dermatologist who had recommended him an oral prednisone treatment in scalar doses which he had practiced for 15 days, blaming methimazole assumption. After oral prednisone treatment he showed a limited improvement of pretibial oedema and bilateral skin lesions.



Figure 1: Thyroid dermopathy of the lower extremity on the pretibial region of the right and left legs (Panel A and B respectively) with an appearance like orange skin, with nonpitting edema and soft tissue swelling.

## DISCUSSION

To our knowledge, this is the first described case of Graves' dermopathy during COVID-19 pandemic.

Thyroid dermopathy (pretibial myxedema) is a rare complication of Graves' disease, usually observed in patients who also have severe GO<sup>5</sup>. This rare finding, in absence of GO, is probably because of COVID-19 pandemic diagnosis and treatment delays of non-COVID related diseases. The patient also had severe hyperthyroidism resistant to pharmacological treatment. The delay of total thyroidectomy - due to the lateness in non-priority surgical procedures - the persistence of thyroid hormone excess, and elevated levels of thyrotropin-receptor antibodies have also contributed to the onset of thyroid dermopathy.

The purpose of this case report is to update information on how patients with chronic disease are affected during an epidemic, and opportunities to improve chronic disease management during an epidemic in settings with limited health care and resources. Additionally, this review can draw the attention of stakeholders to decision-making and action in the spirit of reducing the burden of chronic disease by providing the necessary recommendations for possible changes and expansions of current intervention programs. The knowledge of this complication during treatment of hyperthyroidism is very important not to underestimate its possible appearance.

## CONFLICTS OF INTEREST

The authors declare they have no conflict of interest.

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None.

## AUTHOR CONTRIBUTION

GA: contributed to the contents of the final version of this manuscript.

RDF: provided all clinical features of the patient

LDS: searched the literature on this subject

FA: has processed the image of this manuscript

DP: initiated the preparation of this case report for scientific publication; she wrote the first draft of

### ETHICS STATEMENT

Informed consent was obtained from the patient to report his case, and the manuscript was approved at the Ethics Committee of University of Campania "L. Vanvitelli".

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