



## Thyroid Eye Disease Can Masquerade as Conjunctivitis

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Received: August 11, 2023

Published: August 24, 2023

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### Abstract

A significant portion of patients diagnosed with Grave's Disease have TED that manifest as lid retraction, proptosis, and diplopia [3]. We report a case of a 40-year-old woman who presented with symptoms including rapid heart rate and weight loss. She was initially diagnosed with Grave's Disease in June 2021 but with a notable change in eye appearance in October 2021 was diagnosed with conjunctivitis. Only after the persistence of her conjunctivitis and early morning onset diplopia did she see an oculoplastic specialist who deemed her symptoms more consistent with TED. Thereby emphasizing the importance of further evaluation of signs and symptoms of patients with unilateral or bilateral conjunctivitis blurred vision, diplopia, spontaneous orbital pain, dry eyes, redness, eye fatigue, burning, itching, and photophobia.

**Keywords:** Thyroid; Eye; Disease; Masquerade; Conjunctivitis

### Introduction

Thyroid Eye Disease (or TED) is an autoimmune-associated inflammatory disorder of the orbit known to have almost identical early onset symptoms and signs to conjunctivitis. Later other signs and symptoms can develop including disfiguring proptosis, pain, eyelid retraction, diplopia, and sometimes even blindness. Due to such symptoms and the disease's effect on vision and appearance, TED has the potential to be severely debilitating, and treatments can range from conservative observation requiring anti-inflammatory drugs to active management requiring surgical decompression [3]. According to a clinical study performed in Babol Iran, the most common ocular findings in patients with TED included exophthalmometric proptosis >20 mm (63.8% of patients), lid lag (55.7% of patients), lid retraction (52.8% of patients), need for conjunctival injection (30% of patients) and tearing (38.6% of patients). Additionally, almost 70% had bilateral involvement.

With no intervention, TED can lead to ocular hypertension, optic nerve damage, and glaucoma [3]. Factors such as sex and smoking habits additionally play a significant role in the risk for the development of TED [7]. Although women are five times more likely to develop TED, men who are diagnosed tend to present more severe cases [6]. Despite TED's full pathogenesis being unknown, increased expression of autoantibodies against receptors such as Thyrotropin (TSHr) and increased expression of the growth factor-1 receptor (IGF-1r) in the orbital tissue have been identified as potential causes for orbital inflammation that expands the extraocular muscles and intraconal fat responsible for eye movement and fatty tissue posterior to the eye [6].

On the other hand, conjunctivitis, the most common cause of pink eye in primary care, is characterized by symptoms of increased tear production, itching, hyperemia, and edema [2]. Still, it has different underlying causes for orbital inflammation. conjunctivitis can be

subdivided into 3 common types: viral, allergic, and bacterial which can range from acute to chronic forms [1]. As the most common cause of red eye in primary care, physicians may be tempted to settle on a conjunctivitis diagnosis as the cause of a patient’s orbital inflammation rather than pursuing other possible causes especially with limited access to ocular examination equipment such as a slit lamp in a primary care setting. With this in mind, TED symptoms may masquerade as onset conjunctivitis, when in reality the diagnosis includes a much larger endocrine problem. We report a case in which TED symptoms were misdiagnosed as conjunctivitis.

**Case Report**

A 40-year-old African American woman was diagnosed with Graves Disease in June of 2021. At that time, her presenting symptoms were rapid heart rate and weight loss. She was placed on Methimazole. Her symptoms stabilized on the medication, but six months after she developed red eyes with tearing, irritation, and a gritty sensation. She was seen by multiple eye professionals and was diagnosed with conjunctivitis. When her conjunctivitis persisted and after she developed blurred and double vision, especially in the morning, she then saw an oculoplastics specialist who diagnosed her with TED. She had the classic symptoms of eye redness, fatigue, burning, itching, light sensitivity, double vision, and blurred vision that improved with blinking. She also had eye lid edema, proptosis, and limitation of gaze to the right and left.

**Discussion**

Despite the symptom presentation similarities between TED and conjunctivitis, the key to their differential diagnosis is asking the correct follow-up questions when obtaining a patient history.

For instance, although blurred vision may be a symptom of both, inquiring about associated symptoms such as diplopia, especially in the morning, is imperative as a distinguishing symptom specific to TED (Table 1). This specific symptom was a defining factor in the conjunctivitis misdiagnosis of our patient who had been seen by a primary care provider, two optometrists, and three ophthalmologists before receiving the correct diagnosis of TED. Additionally, eyelid retraction and bulging of the eyes (proptosis) can be telltale signs of TED and will not be observed in patients with conjunctivitis.

Key Signs and Symptoms		
Shared Signs and Symptoms of conjunctivitis and TED	Signs Specific to TED	Symptoms specific to TED
Red eyes	Eyelid retraction	Diplopia especially present in the morning
Burning and itching	Bulging of the eyes (proptosis)	
Increased tear production		
Light sensitivity		
Eyelid edema		
Blurred vision		

**Table 1:** Signs and Symptoms of TED and Conjunctivitis Compared

Due to the nature of TED, the antibodies that cause its characteristic orbital inflammation can target the thyroid as well, resulting in abnormal thyroid function and subsequently altered hormone levels, but it is important to note it is possible for the thyroid hormone levels to be normal in some cases. Hyperthyroid can be characterized by shaking, weight loss, rapid or irregular heart rate, and diaphoresis while hypothyroid can be characterized by fatigue, sensitivity to cold, weight gain, hair loss, and constipation. The symptoms of hyper or hypothyroid in conjunction with orbital inflammation can be a result of TED rather than conjunctivitis. Therefore, inquiring about thyroid imbalances and specific symptoms of these imbalances can be key in TED diagnosis.

**Conclusion**

Although conjunctivitis is a very common cause of eye inflammation, physicians should be more aware of the possibility of TED given its prominence in women. All patients with conjunctivitis should be asked about a history of thyroid imbalance, thyroid medication, or presentation of TED-specific symptoms and signs



**Figure 1:** Case study patient with bilateral TED. Photos taken on 1/23/23 by Dr. Kimberly Cockerham.



**Figure 2:** Acute conjunctivitis of the right eye with watery discharge. Courtesy of Emory Eye Center, Emory University School of Medicine, Atlanta, GA.

in order to rule out TED. If in doubt or if conjunctivitis symptoms persist without relief, refer to an oculoplastic specialist or neuro-ophthalmologist to ensure a proper diagnosis.

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