S1P1 receptor activation and receptor internalization with disruption of normal receptor recycling. Without functional receptor expression, lymphocytes are sequestered in peripheral lymph nodes and unable to enter the systemic circulation. Tissue-specific expression of alternative S1P receptors also mediates a number of other cellular functions, including the upregulation of endothelial adhesion molecules and the disruption of intercellular adhesions.\(^4\) It is plausible that these unintended effects increase vascular adhesion, promote hemodynamic stasis, and degrade vessel integrity, resulting in adverse peripheral vascular events, ME, and retinal vein occlusions.

Our patient’s history of splenectomy may also be relevant. Having undergone a splenectomy increased her vaso-occlusive risk, including that of a retinal vein occlusion. The effectiveness of fingolimod in an asplenic patient should also be considered, given that fingolimod’s mechanism of action is to sequester lymphocytes in lymphoid tissue. Though animal studies of fingolimod in mice with splenectomies have demonstrated reductions in circulating peripheral lymphocytes, asplenia may represent a unique condition that should be considered in humans.\(^5\)

In summary, retinal vein occlusions should be considered as a potential adverse event in patients taking fingolimod. Cessation of fingolimod can be sufficient to allow for spontaneous resolution of venous occlusions and associated ME, avoiding potentially invasive treatments. The value of diluted retinal examination in addition to macular OCT evaluation in fingolimod-treated patients is emphasized by the fact that our patient demonstrated ME on OCT, indistinguishable for the typical OCT appearance of fingolimod-associated ME without associated BRVO.

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Nomenclature: thyroid-associated orbitopathy, Graves ophthalmopathy, or thyroid eye disease?

Nomenclature in medicine affects scientific accuracy, patient perceptions, communication, and information retrieval. We opine that the terms “thyroid eye disease” (TED) or “Graves ophthalmopathy” (GOp) used to designate the most common nontraumatic orbitopathy we encounter as ophthalmologists are inappropriate; a better appellation for this autoimmune orbitopathy usually associated with dysthyroidism is “thyroid-associated orbitopathy” (TAO).

The reasons to adopt the nomenclature of TAO include (i) scientific accuracy, (ii) the disadvantages of eponyms, and (iii)
standardization of terminology to facilitate communication and the retrieval of information from electronic databases.

1. A disease label should concisely convey relevant information, reflect current concepts of pathophysiology, and be comprehensible by interdisciplinary groups. Thus, we should avoid the misnomers for TAO that use the designation “ophthalmopathy” or “eye disease.” The orbital fibroblast is the target and effector cell in the autoimmune process, and TAO is a primary orbitopathy where the eye can be secondarily affected. Although expressions such as TED may be understood by laypeople, it misplaces the primary location of the pathology and inappropriately attributes causation. The thyroid gland is not, in and of itself, the cause of the orbitopathy. The qualifier “association” in TAO does not betoken causation. An even more exact moniker than TAO would be “autoimmune orbitopathy usually associated with dysthyroidism and lid retraction” (AOUADLR), but the acronym is cumbersome and somewhat pleonastic.

2. Although historic eponyms such as “Graves” and “von Basedow” are a “form of medical shorthand” that “bring colour to medicine” and remind us of the “embedded medical traditions and culture in our history,” these namesakes do not provide lucid information and may not be meaningful when they cross linguistic, cultural, or generational borders, thus hampering medical discourse in a globalized world. Also, the eponym “Graves” or “Graves” in conjunction with “ophthalmopathy” or “orbitopathy” has several drawbacks. “Graves disease” implies hyperthyroidism, but 7% or more of patients with TAO are euthyroid or hypothyroid. Occasionally, the “Graves” eponym may evoke unnecessary patient angst given its allusion to a burial place.

3. The standardization of nomenclature is not to remove diversity from the medical literature, but instead as a bulwark against confusion. For example, in the same 2018, Volume 34, Supplement 4 issue of the journal Ophthalamic Plastic Reconstructive Surgery, 6 separate articles on the topic of TAO used in their title or abstract the disparate terms “Graves orbitopathy,” “TED,” “GOp,” “dysthyroid optic neuropathy,” and “thyroid eye disease-compensative optic neuropathy.” An uninformed reader might conceive that the aforementioned articles were about different conditions. Indeed, the web site of the well-established National Organization for Rare Disorders lists 3 “subdivisions” of Graves disease: “Graves dermopathy, Graves orbitopathy, and Graves ophthalmopathy,” as if the latter 2 are separate entities.

Keyword searches of electronic databases and medical records are hampered by the many synonyms for TAO. Our review of the TAO literature from the last decade using the terms TAO and 10 keyword synonyms (i.e., thyroid-associated ophthalmopathy, TED, Graves eye disease, GOp/orbitopathy, Basedow ophthalmopathy/orbitopathy, dysthyroid ophthalmopathy/orbitopathy, and thyroid-related immune orbitopathy) showed marked variation in the number of articles from each keyword search with an average and standard deviation of 1282 ± 851 results in PubMed, 264 ± 339 retrievals in Embase, and 9417 ± 10 196 returns from Google Scholar. On PubMed, the keyword “thyroid eye disease” had the highest number of accruals, followed by “Graves orbitopathy.” On Embase, the keywords “Graves ophthalmopathy” and “Graves orbitopathy” had the highest yield. On Google Scholar, “thyroid eye disease” and “Graves eye disease” provided the most results. The “orbitopathy” synonyms for TAO yielded 26.3%, 34.3%, and 14.9% of the total returns on PubMed, Embase, and Google Scholar, respectively.

Disease names, once attributed, may be difficult to change even if more appropriate monikers are available. Medical journals could assist in the transition by adopting a uniform lexicon, and placing the “Graves” eponym or “ophthalmopathy” terms in parentheses, for example, “thyroid-associated orbitopathy (Graves)” or “thyroid-associated orbitopathy (thyroid eye disease).” In the interim, for research purposes, instead of keyword searches, PubMed searches should be repeated using the medical subject heading, “graves ophthalmopathy,” and Embase with “endocrine ophthalmopathy.”

Organizations such as the International Thyroid Eye Disease Society (ITEDS) and the European Group On Graves’ Orbitopathy (EUGOGO) may resist changing their familiarized societal acronyms. However, understanding and communication begin with precise terminology. ITEDS could transition its name to the “International Thyroid Orbital Disease Society” (ITODS) or the “International Thyroid-Associated Orbitopathy Society” (ITAOS). EUGOGO correctly acknowledges TAO as an orbitopathy, but if unwilling to drop the eponym, should at least discontinue the genitive form.

If specialists in TAO understand the limitations of sobriquets like “TED” and “GO,” why not just maintain the status quo? The answer is that our patients and colleagues may not know the nuances of the misnomers, and electronic databases may not recognize more accurate terms such as TAO. Familiarity with labels that have been “grandfathered-in” is no excuse for improving our accuracy in communication. “Evolution in terminology is common, useful and frankly healthy.” A standard lexicon should be increasingly encouraged and applied, especially in the era of electronic medical records. The adoption of a standard term in the Systematized Nomenclature of Medicine-Clinical Terms would help with data retrieval and communication.

There have been many semantic corrections to enhance the precision of the orbital literature. We have evolved from “orbital pseudotumor” to “orbital inflammatory syndrome” or “idiopathic nongranulomatous orbital inflammation.” We now refer to “lymphangiommas” as “venolymphatic malformations,” to better classify their pathophysiology. For various reasons we have migrated from the eponym “Wege- ners granulomatosis” to the designation “granulomatosis with polyangiitis.” Given our push for terminological
exactitude, it behooves us to use a more precise term such as TAO, for the most commonly occurring orbital disease. In doing so, we seek not to remove diversity in the medical literature but to reduce sources of confusion for our colleagues and patients and in electronic searches.

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“Percussive” orbital trauma from wooden drumstick

Although penetrating orbital traumas are rare,1 they are associated with high rates of mortality and monocular blindness.2,3 In addition, they can cause damage to adjacent structures such as the brain, the cavernous sinus, and major arteries. Reported complications include hemorrhage, thrombosis, neurological deficits, facial fractures and associated deformations, and infections.1 Optimal management of orbital penetrating injuries includes prompt and thorough evaluation and multidisciplinary collaboration between ophthalmology, neurosurgery, trauma surgery, otolaryngology, and radiology.

Here, we present a case of a 68-year-old man who sustained an orbital penetration injury with a 43 cm musical drumstick, which entered the right orbit, displaced the globe, and transited to the left maxillary sinus. Interestingly, the injury spared the globe, optic nerve, brain, and large blood vessels. Swift removal under endoscopic visualization was critical in the successful surgical management of the patient, and the patient’s vision was unaffected. To the best of our knowledge, no reported case of penetrating orbital trauma has involved a foreign body of this length without the occurrence of permanent visual or neurologic sequelae.

A 68-year-old man presented as a trauma transfer with a penetrating orbital injury. According to emergency medical services, a wooden musical drumstick was used as a weapon to impale the right orbit of the patient by another individual during an altercation. The patient arrived at our institution intubated and sedated from an outside hospital, where tetanus prophylaxis had been administered. He was hemodynamically stable. Physical examination revealed a large wooden drumstick still present in the right orbit; the drumstick penetrated the medial aspect of the right lower eyelid, with its vector directed inferomedially toward the nose and the lower left side of the face. The right eye could not be visualized on attempt to open the eyelid. The left eye appeared normal and was reactive to light and accommodation. Computed tomography (CT) of the head revealed that the object pierced the right inferior and medial orbital walls at the level of the naso-orbito-ethmoid complex, and crossed obliquely through both ethmoid sinuses and the nasal cavity with the tip ultimately resting in the left maxillary sinus (Fig. 1). The estimated length of the intraorbital portion of the drumstick was 3.8 cm. The drumstick’s trajectory abutted the left sphenoid sinus, adjacent to but not penetrating the carotid (Supplementary Fig. 1, available online). No hematoma was noted. The trauma additionally produced an orbital floor fracture on the contralateral side.

Fig. 1—(A) External photograph depicting the position and trajectory of the musical drumstick in the right orbit. (B) Computed tomography image demonstrating the radiolucent wooden drumstick (blue asterisk) penetrating the medial orbital wall, and into the nasal cavities.