

A Plea for Consistency in Orbital Cellulitis Terminology

Augusto Antonio V Cruz^{1,2} and Amir Pirouzian^{2,3*}

¹Department of Ophthalmology and Otorhinolaryngology, University of São Paulo, Brazil

²The Wilmer Eye Institute, The Johns Hopkins University School of Medicine, USA

³The Farabi Eye Hospital, Tehran University of Medical Sciences, Iran

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*Corresponding author

Amir Pirouzian, Wilmer Eye Institute, Johns Hopkins University School of Medicine, 600 North Wolfe Street Baltimore, MD 21287, USA, Tel: 443-287-1511; Email: apirouzian@gmail.com

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Abstract

Purpose: To urge and remind authors in appropriate use of terminology to describe and classify orbital cellulitis subtypes including eyelid edema, peri-orbital or pre-septal cellulitis.

Methods: Review of classical and recent peer-reviewed literature.

Results: Historical classification of various stages of orbital cellulitis traces as far back as to the initial Hubert publication on orbital infections. Countless follow-up articles present periorbital cellulitis as the first of the 5 non-progressive types of orbital infections. Presently the orbital cellulitis classification, however, is associated to Chandler's name. The only discrepancy between Hubert's and Chandler's classifications was the nature of eyelid edema. It is inflammatory as described by Hubert whereas it has a vascular origin as described by Chandler. Labeling an eyelid edema as pre-septal cellulitis is conceptually imprecise.

Conclusion: Proper use of orbital cellulitis in correlation to clinical symptoms and signs in the literature is paramount. This will lead to uniformity and a better understanding amongst surgeons. Eyelid edema without any radiological sign of orbital inflammation should not be referred as preseptal cellulitis. Eyelid edema is sufficient enough.

Orbital cellulitis is a serious condition with potentially significant ocular and neurological sequelae. There is a vast amount of published literature on this topic in the peer-reviewed journals. However, it is curious to note that despite its undisputed medical importance, the terminology used to describe orbital cellulitis subtypes or classifying this disease is extremely confusing. Adjectives such as peri-orbital and retro-orbital are indistinctly used to denote a clinical entity in a spectrum of orbital infections and the term "pre-septal" which anatomically means outside the orbit is widely employed to stage orbital infections.

It is quite obvious that the prefixes 'peri' and 'retro' should not be employed to describe the primary stage of orbital cellulitis let alone to define a process that is happening inside the orbit. "Peri" means around and "retro" means behind, therefore by definition anything that is periorbital is happening outside and not inside the orbit. The practice of using the term "preseptal cellulitis" in literature to coin the early stages of orbital infections deserves even a lengthier comment.

The history of classifying various stages of orbital cellulitis can be traced as far back as to the thirties when Hubert published a seminal paper in 1937 about orbital infections due to sinusitis [1]. Eleven years later Smith and Spencer [2] republished Hubert's ideas and in 1970 Chandler, Langenbrunner and Stevenes [3] revisited the same theme and published a modification of Hubert's classification. Their article presents peri-orbital cellulitis as the first of the 5 non progressive types of orbital infections. Since then, the orbital cellulitis classification is associated to Chandler's name. The classification of orbital cellulitis subtypes by both authors is described and compared in table 1.

Table 1: Subtypes of cellulites.

Author/year	Subtypes of cellulites				
	Group 1	Group 2	Group 3	Group 4	Group 5
Hubert/1937	Inflammatory edema of the eyelids with or without edema of the orbit	Subperiosteal abscess	Orbital abscess	Orbital cellulitis	Cavernous sinus thrombosis
Chandler/1970	Inflammatory edema	Orbital cellulitis	Subperiosteal abscess	Orbital abscess	Cavernous sinus thrombosis

It is clear that more than 3 decades after Hubert's article, Chandler and co-authors' sub23 classification of the orbital cellulitis was essentially based on and closely resembled Hubert's conceptual framework on how sinus infections involve the orbit. A modification made by Chandler was on the progressive stages of "orbital cellulitis" to intracranial extension and the precise definition of this condition. While in the original Hubert's organizational schematic this subtype was believed to reflect a generalized orbital phlebitis, Chandler used "cellulitis" to describe a diffuse

edema of the orbital contents caused by infiltration of the adipose tissue with inflammatory cells and bacteria. Hence it is not by chance that Chandler put this subset right after group 1 or the so-called “Inflammatory edema”. This category is a source of misunderstanding that pervades the literature up to now because many authors use the fancy term “pre-septal cellulitis” to describe it. As recently as in 2012, authors have continued to use ‘periorbital’ and ‘pre-septal’ cellulitis terms interchangeably for eyelid edema associated with inflammation with soft connective tissue around the eyes or anterior to orbital septum and a few have passionately argued for use of “severity” grading systems as an objective clinical tool for appropriate patient follow-up [4] Their arguments have even extended to which groups of physicians should assess and follow-up patients for this condition [5].

The essential question is whether it is appropriate to use this designation as a synonym of group of orbital cellulitis? The answer is an emphatic no. Let’s elaborate why pre-septal cellulitis should not be used to name Chandler’s group and speculate what Hubert and Chandler had in mind to describe this subset of patients. Chandler’s definition of this category was: “this (edema) affects the eyelids with or without edema of the orbital contents. The swelling is probably due to impedance of the flow of blood. The eyelids may become remarkably swollen but not tender. There is no limitation of extra-ocular movements, and there is no impairment of visual acuity. There might be slight proptosis of the globe as a result of edema of the orbital contents.” This description is an almost literal copy of Hubert’s definition, which was even more specific about the lack of any infection on the eyelids or orbit “the infection is confined to the nasal sinus, and there is only an inflammatory edema of the lids, which may be marked swollen. However the eye is movable in all directions and the vision is usually not affected. In this stage the orbit proper is not involved”. We see that the only discrepancy between Hubert and Chandler was the nature of eyelid edema. While for Hubert it was inflammatory, for Chandler it had a vascular origin.

Both saw eyelid edema as an extra-sinusual manifestation of sinusitis and not indication of orbital or eyelid infection. In summary, to label an eyelid edema as pre-septal cellulitis is not only conceptually imprecise but also a historical mistake.

So what are we left in terms of orbital cellulitis subtypes in the era of high resolution multi-detector computed tomography and magnetic resonance imaging? Let us be clear that the cavernous sinus thrombosis is not a subtype of orbital cellulitis. This noted complication is an intracranial extension of orbital cellulitis. There is no question in the literature about sub classification of subperiosteal and orbital abscess of orbital cellulitis. Those subtypes are well delineated conditions that have been reported many times in all series on orbital infections. Orbital inflammatory edema certainly occurs as an initial manifestation of orbital disease and probably can be detected with modern orbital imaging techniques in most cases of Hubert and Chandler’s category. The conclusion is that eyelid edema without any radiological sign of orbital inflammation should not be referred as preseptal cellulitis. Eyelid edema is enough!

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