

Benefits of Sonographic Examination for Diagnosis and Treatment of Occipital Neuralgia

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Editorial

Occipital neuralgia a type of headache that involves irritation and inflammation of the Greater Occipital Nerve (GON). Diagnosis of this headache is achieved mainly through clinical examinations where tenderness is noted along the distribution of the GON. However, anatomical studies have demonstrated its various course and distribution that may be distant from the conventional landmarks where routine anesthetic injectate is administered "blindly". Furthermore, GON may have multiple branches that unless the most proximal nerve is not approached, injection may not be complete. Therefore, utilization of sonography can add benefits for diagnostic work-up and treatment of occipital neuralgia by enabling accurate localization of and measurement of the cross-sectional area (CSA) of GON.

Occipital neuralgia is typically diagnosed clinically, however, a standard diagnostic criteria has been established by the International Headache Society-a) paroxysmal stabbing pain with or without persistent aching between paroxysms, in the distributions of the greater, lesser, and third occipital nerves, b) tenderness over the affected nerve, and c) pain eased temporarily by local anesthetic block of the nerve [1]. The average CSA of GON is only $2 \text{ mm}^2 \pm 1 \text{ mm}^2$ and its course varies from person to person [2]. This would be a great challenge to accurately pin-point to the actual nerve. Furthermore, pain may arise not only from the nerve irritation but possibly from adjacent myofascia, artery and/or apophyseal joint. Sonography allows a window to visualize GON at the most proximal zone where the nerve may be entrapped between the obliquus capitis inferior muscle and semispinalis capitis muscle [2]. By doing so, the actual nerve and contiguous structures are evaluated. If the GON is entrapped, enlarged CSA confirms diagnosis and may be palpated under sonography guidance to reaffirm diagnosis [3].

In an anatomical study by Becser et al. [4] variation of the greater occipital nerve was noted. Their observation of GON branching below the intermastoid line was also confirmed by a sonographic evaluation of the asymptomatic GON [2]. Due to such nature of branching of GON, blind approach for anesthetic injection may be inappropriate at times. Greher et al. [5] has demonstrated in a cadaveric study where injection with dye at this proximal site colored all GON (20/20) with dye. All being said, however, to my knowledge, there is no *in-vivo* clinical trial comparing the patient outcome from blind injection versus sonography guided injection in the literature.

To this time, there is no other imaging modality that enables visualization of the GON better than sonography. Sonography of GON is of benefit in ways that the most proximal zone of entrapment of the nerve can be visualized, the CSA measured for diagnosis and lastly, accurate blockade is administered for potentially improved outcome.

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Received April 24, 2012; Accepted April 25, 2012; Published April 27, 2012

Citation: Cho JCS (2012) Benefits of Sonographic Examination for Diagnosis and Treatment of Occipital Neuralgia. OMICS J Radiology. 1:e108. doi:10.4172/2167-7964.1000e108

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