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# Discussion

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## Relevance of the Lesser Occipital Nerve in Facial Rejuvenation Surgery

by **Marcello Pantaloni, M.D., and Patrick Sullivan, M.D.**

*Discussion by Eric David Austad, M.D.*

Invited discussions in this journal are usually laudatory, confirmatory, inflammatory, derogatory, or predatory. This article by Drs. Pantaloni and Sullivan deserves a laudatory discussion, and I can provide that. They have asked a question of some clinical pertinence—How does the anatomy of the lesser occipital nerve relate to face lift surgery?—and they have answered it quite elegantly with laboratory dissections and observations from the operating room. Surprisingly, 5 of 19 cadaver dissections revealed that the lesser occipital nerve, rather than the greater auricular nerve, provided sensibility to the superior two-thirds of the ear. This knowledge and other more specific anatomic observations lead us to a greater understanding of this relatively unappreciated nerve and might prompt us to change dissection techniques in the postauricular region.

Whereas I can praise this article, there seems to be little value in reiterating the information these authors have presented quite clearly and succinctly. I cannot confirm much less criticize or disparage this work because I am a greater occipital nerve specialist, and do not deal much with the lesser occipital system. Although this might seem to be specialization in the extreme, I would say in my defense that I am equally conversant with both the right and left greater occipital nerves, and I would not consider lateralizing. Having expressed my relative inexperience with the lesser occipital nerve to the co-editor of this journal, and suggesting that this article might stand entirely on its own merit without discussion or that it might benefit from discussion by a colleague

who performs face lifts on a daily basis, I was invited instead to comment more extensively on the greater occipital nerve and my experience with it. After all, the same CPT code (64722) is used to describe the surgical management of either nerve, suggesting that some higher power considers them to be interchangeable. The following is a brief, subjective, and personal review of my experience in surgically treating approximately 300 patients with occipital neuritis over a period of 19 years.

In 1981, shortly after I entered private practice, a neurologist colleague called me to describe a difficult clinical problem he had encountered. A woman had been hospitalized for several weeks with intractable occipital headache and had undergone extensive neurodiagnostic testing without evidence of a structural lesion; she was refractory to every medication her physicians prescribed. However, she repeatedly experienced 6 to 8 hours of complete relief after placement of local anesthetic blocks to the occipital regions. Her presumptive diagnosis, therefore, was occipital neuritis; my colleague requested that I consider performing occipital neurectomy. I had never before participated in the care of such a patient and knew virtually nothing about occipital neuritis, but I agreed to review the literature before declining to become involved. I was aware, even then, of the adage that pain alone is not a good indication for surgery. However, I was also aware of Dr. Peter Jannetta's 1966 hypothesis that vascular compression of the trigeminal nerve in the posterior fossa could cause trigeminal neuralgia<sup>1</sup>; this has subsequently become a major

theme of his surgical career at Presbyterian University Hospital in Pittsburgh. As an intern at Charity Hospital in New Orleans in 1969, I spent several months working on Dr. Jannetta's service, and I continue to have great respect for his ingenuity and his surgical skill. If pain can prompt an exploration of the posterior fossa, was it unreasonable to explore, and perhaps transect, a nerve lying only 5 to 6 mm below the occipital scalp? My 1981 review of the literature pertaining to occipital neuritis was not encouraging. The literature was sparse, much of it anecdotal, and from it one could conclude that (1) patients with occipital neuritis were almost always cured with occipital injections of steroids, (2) patients often/sometimes benefited from occipital neurectomy, or (3) surgical treatment of occipital neuritis is/was inadvisable and could be detrimental. I had never researched a treatment-related topic that offered so little consensus of opinion; in fact, I have followed the more recent literature with interest, and I find that a thoughtful approach to the surgical management of occipital neuritis remains quite elusive.

I called my colleague, whose patient was still hospitalized and still responding to occipital blocks, and I expressed my reluctance to offer surgical intervention of any kind for this difficult problem. However, after extensive discussion with him and with the patient, it seemed both reasonable and humane to proceed. I isolated the greater occipital nerves bilaterally (her pain was bilateral) and resected segments of approximately 5 mm from each. The proximal nerve transection was performed under tension at the exit point from the trapezius muscle; this allowed the proximal nerve to retract into muscle, with the hope of avoiding neuroma formation. The patient was headache-free the following morning and was discharged later that day. I followed her for several years before she was lost to follow-up, and she experienced no further difficulties during that interval. My interest in the surgical management of these patients had begun.

I have not formally reviewed my experience in surgically treating occipital neuritis patients for several reasons. As I will discuss later, there are unique difficulties involved in describing outcomes when pain is the primary indication for surgery. Moreover, the time constraints involved in providing an invited discussion simply do not allow an opportunity for extensive chart review and statistical analysis, much less

for a prospective double-blinded study. However, I estimate that I have seen approximately 600 patients with a presumptive diagnosis of occipital neuritis over the past 19 years, most of whom presented with only minor variations of the clinical features of my first patient. Approximately half (300) of those patients underwent surgery, either neurectomy or neurolysis (to be discussed). The remaining 50 percent, for varying reasons, were not treated surgically. Interestingly, only a few patients of the untreated group were offered surgery and declined it, despite my preoperative discussions with every patient emphasizing that surgery may simply not result in pain improvement.

Salient features of my treatment protocol and experience are as follows:

- Virtually every one of my patients undergoes neurologic consultation to eliminate other causes of intractable headache, usually before my evaluation begins. Neurologists also manage all aspects of pain medication, with the exception of the immediate postoperative period.
- A careful history is obtained. Specific trauma or illness appears to precipitate this type of head pain in approximately 50 percent of cases; litigation or disability issues are present in only 10 to 15 percent. Pain is unilateral in about half of my patient population, with no apparent right-left propensity.
- Physical examination is often useful in identifying specific trigger points, scalp sensory asymmetries, and, occasionally, perineural masses (usually lymph nodes).
- No *objective* preoperative testing modalities (i.e., CAT scans, electrodiagnostic studies, etc.) have been helpful in identifying abnormalities of the greater occipital nerve.
- Although many of my patients have received and benefited from occipital blocks before my first evaluation, I always block them myself (1.5 cc Marcaine 0.5% plain, with or without 1.5 cc of Kenalog 10 mg/cc *per side*), placing the drug mixture in a horizontal band approximately 2 cm long over the trapezius insertion point and centered approximately 4 cm from the midline. This typically incorporates a point of maximum tenderness encountered at physical examination, includes aberrant nerve branches, and represents the level at which I can access the nerve without extensive dissection.

- I believe that the local anesthetic component of these blocks provides a preview of sorts, representing, for 4 to 6 hours, the *maximum* benefit a patient might experience from surgical management. If this postblock interval of pain relief is not dramatic, we often try one or two repeat blocks, but if there is not a clear benefit we do not proceed surgically. Steroids may prolong a pain-free interval to at least 6 to 8 weeks, and I occasionally see complete resolution with one or two steroid blocks. The underlying logic and decision-making regarding blocks are quite comparable to those of patients with carpal tunnel syndrome.
- Informed consent for surgery includes all of the usual issues (bleeding, infection, etc.), as well as a very clear statement that the surgery may simply not be beneficial as regards improvement of pain. Conversely, I note that the risks involved are roughly comparable to having an appendectomy or tubal ligation; this is not “brain surgery,” although a surprising number of sophisticated patients need to be reassured of that.
- The surgical procedure usually proceeds on an outpatient basis, using local anesthesia with sedation. Loupe magnification is very helpful. The horizontal scalp incision is typically 3 to 4 cm long, centered over the trapezius insertion 4 cm from the midline. I do not “chase” trigger points in other areas unless I strongly suspect that a posttraumatic neuroma is present (history of craniectomy or open injury). A self-retaining retractor is very helpful in identifying the nerve trunk; much of the dissection is blunt unless perineural scarring is prominent.
- In the early to mid-1980s, my general surgical plan was to identify and transect all identifiable branches of the greater occipital nerve, allowing proximal nerve endings to retract into muscle. This, of course, required a preoperative discussion of neuroma formation and its possible consequences. Suggesting that *new* and possibly disabling pain might be a consequence of this surgery is not, in my view, a routinely acceptable situation for either patient or surgeon. For the last 15 years, absent very unusual situations, I perform neurolysis rather than neurectomy, carefully preserving the nerve and its branches.
- The location of the greater occipital nerve trunk, and its relationship to the occipital

artery, are often anomalous in the population I have treated surgically. Although I can usually identify the trunk within 5 minutes of exposing the field, I occasionally spend 60 to 90 minutes on a single side and may then be able to identify only a few small nerve branches. Fibrosis may be prominent, even in the absence of a specific history of trauma.

- I typically expose approximately 2 to 3 cm of the nerve, opening the trapezius longitudinally over the nerve to gain access and decompress it. At or near the exit point from trapezius, approximately 30 percent of my patients have displayed perineural lymph nodes that appear to be causing extraneural compression (Fig. 1). I always resect these; to histologic evaluation, they have always been benign. Interestingly, several of my patients dated onset of their head pain to documented episodes of mononucleosis.
- The occipital artery usually lies adjacent or superficial to the nerve trunk and often is a useful landmark in identifying the nerve. However, in 30 to 40 percent of my patients the artery appears to significantly compress the nerve: it might form a convoluted mass of intertwined nerve and arterial branches, or the nerve trunk might pass directly through an arterial bifurcation and experience intermittent compression with systole (the Jannetta phenomenon). I routinely resect these arterial segments and use cautery for the arterial stumps; I avoid using deep suture material or clips in this patient population.
- Since 1997, after exposing and externally decompressing the nerve trunk and its branches, an anesthesiology colleague spe-

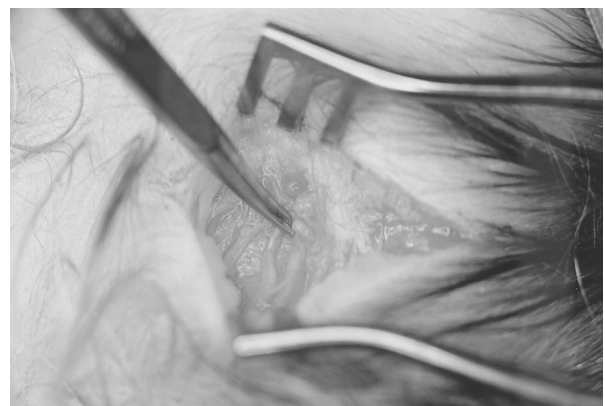


FIG. 1. Isolated greater occipital nerve trunk with the perineural lymph node at the tip of the hemostat.

cializing in pain management has placed a cryoprobe directly on the trunk, obtaining cryolysis (Fig. 2). The neurophysiologic basis for this maneuver remains mystical, at least to me, but empirically it seems beneficial in this early series, and I have not seen complications that I would attribute to it.

- Although postoperative pain relief may be immediate and dramatic, I occasionally see pain (reduced, perhaps) persist for 6 to 8 months, followed by gradual clearing. I believe this is related to perineural edema and nerve irritation caused by the surgery itself, and I am careful to inform patients of this possibility preoperatively. Could this also suggest that the surgery was of no benefit, and that the pain was self-limiting or resolved spontaneously? That is possible, although most of those patients attribute this late improvement to their surgery, and, considering their long and difficult histories, I am inclined to do so as well.

I believe that this group of patients, treated surgically for occipital neuritis, is larger than any series reported more formally in the literature. Although I attempt to follow these patients postoperatively and am readily available to them, I have only a studied impression of our surgical success rate. I have been unable, as yet, to objectively measure patient benefit in a controlled, preferably prospective, and (optimally) blinded way. Surgery for pain does not lend itself to 5-year survival rates, and many

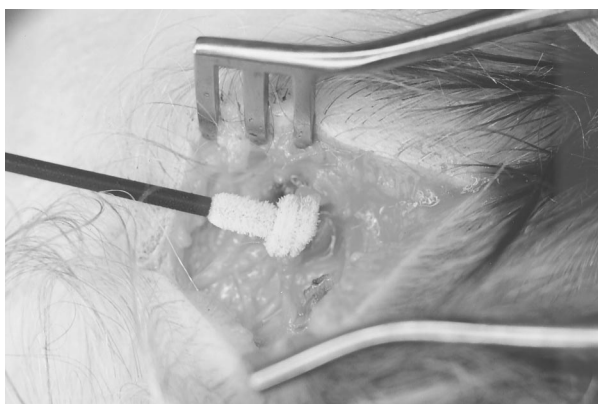


FIG. 2. Cryolysis of the greater occipital nerve after lymph node excision.

treated patients fall into a spectrum of definite, but incomplete, improvement. Different types of head pain (concomitant migraine headaches, for example), or pain at other sites could require ongoing drug therapy in this complex patient population. My best estimate of our surgical success, and the way I present the situation to patients, is as follows: Approximately one-third of my patients is dramatically improved or pain-free after this surgery; another one-third is definitely improved, but remain significantly impaired; one-third does not benefit. Re-operation is fairly rare: approximately 10 percent undergo more than one procedure, indicated primarily by definite improvement after the first procedure, followed by pain recurrence and response to blocks once again. Other complications have been very rare: I have experienced one seroma in this series, which resolved spontaneously, and a few patients have noted scalp irritation from an inverted hair follicle, but infection and hematoma have not occurred and scarring is usually imperceptible.

I would not urge plastic surgeons, generally, to incorporate occipital neurolysis into the range of procedures they provide; the surgical technique is readily mastered, and complications are minimal, but the patient population is unusually complex and the underlying problem itself seems quite rare. Thoughtful preoperative and postoperative communication with involved neurologists and other pain management specialists is essential; occipital neurolysis is clearly not the "treatment of choice" for all occipital "headaches." That said, I believe that the procedure has a sound and logical anatomic basis and, for appropriate patients, offers a realistic hope of relief from disabling pain. Plastic surgeons with experience and interest in peripheral nerve surgery will find this to be challenging and, often, satisfying.

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#### REFERENCE

1. Shelton M. *Working in a Very Small Space*. New York: W. W. Norton, 1989.