

Occipital site deactivation for the treatment of chronic migraine: a minimally invasive approach

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Abstract. – In this paper, we describe our experience in treating migraine headache localized in the occipital area. Using our minimally-invasive approach, from June 2011 till January 2022, we have performed MH decompression surgery over 232 patients with occipital migraine trigger site. After a mean follow-up of 20 months (range, 3-62 months), patients complaining for occipital MH had 94% positive surgical outcome (86% complete MH elimination). Only rare minor complications were reported (e.g., oedema, paresthesia, ecchymosis, and numbness). Presented, in part, at the XXIV Annual Meeting European Society of Surgery (Genoa, Italy, May 28-29, 2022), at the Celtic Meeting of the British Association of Plastic, Reconstructive and Aesthetic Surgeons (BAPRAS), (Dunblane, Scotland, September 8-9, 2022), at the Fourteenth Quadrennial European Society of Plastic, Reconstructive and Aesthetic Surgery Conference, (Porto, Portugal, October 5-7, 2022), at the 91st Annual Meeting of the American Society of Plastic Surgery, (Boston, USA, October 27-30, 2022), and at the 76 BAPRAS (British Association of Plastic, Reconstructive and Aesthetic Surgery) Scientific Meeting, (London, UK, November 30 – December 2, 2022).

Key Words:

Migraine treatment, Migraine surgery, Occipital nerve, Mini-invasive surgery.

The peripheral theory of Migraine Headache (MH) pathogenesis has been widely popularized and recognized as one of the main etiologies of MH. Indeed, chronic compression of terminal branches of craniofacial nerves caused by surrounding structures (e.g., muscles, vessels, and fascial bands) can cause neuronal hyperexcitability and inflammation acting as potential trigger for MH attacks. In this scenario, the surgical treatment of the occipital area described as Site IV relies on the peripheral release of sensory occipital nerves' entrapment¹⁻²⁰. In this paper, we describe our operative technique in occipital migraine surgery²¹⁻³⁹.

All patients previously must undergo a full examination by neurologists to confirm the diagnosis of migraine headache in accordance with the guidelines established by the International Headache Society. The study was conducted in compliance with the Declaration of Helsinki and the Guidelines for Good Clinical Practice; all enrolled patients provided written informed consent before their inclusion in the study. The patients suffer from chronic refractory migraine starting from the occipital region and had failed multiple preventative medications. In our experience, the greater occipital nerve (GON) is the most frequent (about 85% of the patients) occipital MH trigger given the close relationship with the occipital artery (OA), although in a minority of cases (15%) the lesser occipital nerve (LON) is involved. Therefore, our standard surgical procedure primarily aims at eliminating the pulsatile irritation of the OA to the GON by ligating or coagulating the artery prior to and above the intersection or coiling segment, along with GON neurolysis. Neurolysis of the LON is performed (according to patient' symptoms) when needed.



Figure 1. After a horizontal scalp incision at the superior nuchal ridge, blunt dissection of the occipitalis, trapezius, and splenius muscles is performed close to the trigger point in order to isolate the occipital nerves and arteries.

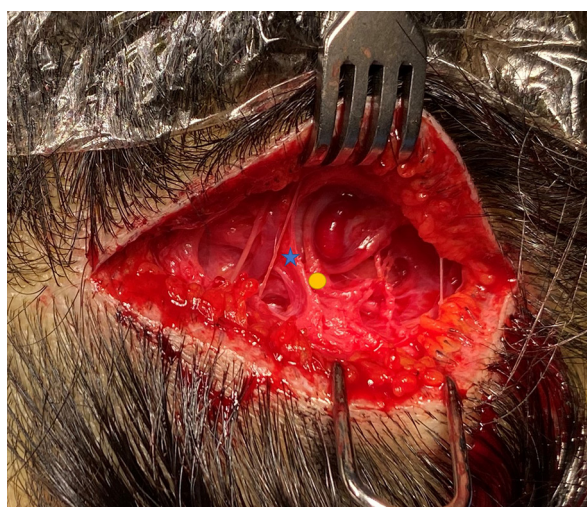


Figure 2. Greater occipital nerve (yellow circle) running medially to the occipital artery (blue star).

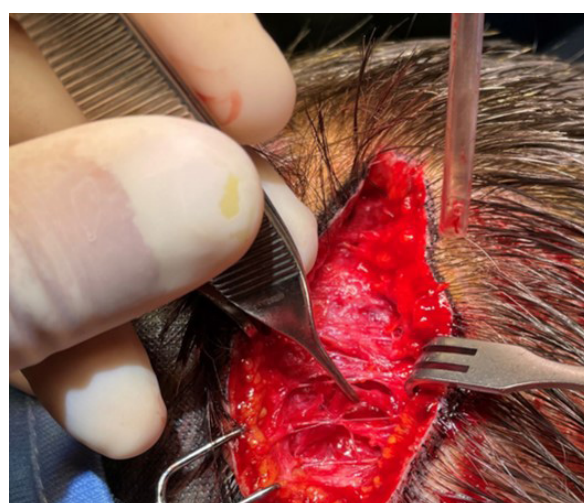


Figure 3. Coagulation of the left occipital artery.

Before local anesthesia, we mark a 5-cm horizontal cutaneous incision where patients pinpoint the painful spot at the level of the superior nuchal ridge; according to the cases, the incision(s) may be mono- or bi-lateral. The cutaneous incision must be performed with the blade parallel to the surrounding hair shaft, not to injure the underlying hair bulbs. This results in a less noticeable post-operative scar. Dissection is then carried out with the help of blunt tipped scissors (Figure 1) to expose and isolate both the GON and OA (Figure 2), which is ligated/coagulated both proximally and caudally to the area of nerve-artery intersection (Figure 3). We usually observe a strict GON-OA relationship (being either a simple crossover or a helical intertwinning). The procedure is completed by 3-0 nylon cutaneous sutures.

From June 2011 till January 2022, we have performed MH decompression surgery over 232 patients with site occipital migraine trigger site. After a mean follow-up of 20 months (range, 3-62 months), patients complaining for occipital MH had 94% positive surgical outcome (86% complete MH elimination). Only rare minor complications were usually reported (e.g., oedema, paresthesia, ecchymosis, and numbness). Numbness, in particular, can occur (lasting <1 year, 163 days on average) in 5.7% of the patients.

In conclusion, in our experience, this minimally invasive approach allowed to obtain satisfying and reproducible results, with a low complication rate.

Conflict of Interest

The Authors declare that they have no conflict of interests.

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None.

Informed Consent

All enrolled patients provided written informed consent before their inclusion in the study.

Ethics Approval

The study was conducted in compliance with the Declaration of Helsinki and the Guidelines for Good Clinical Practice.

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