



Craniofacial Pain: Occipital Neuralgia and Nerve Block

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Introduction: Occipital Neuralgia

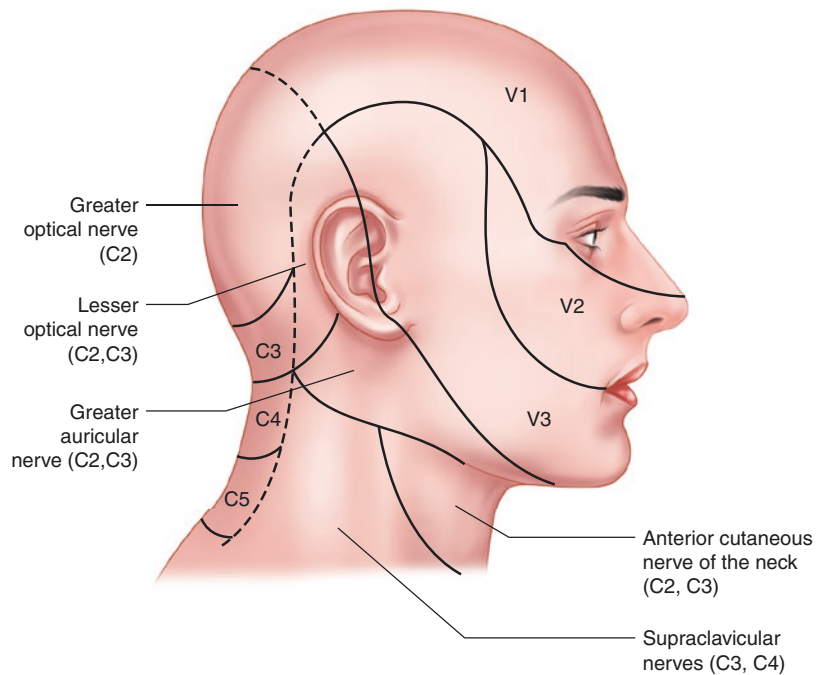
- Occipital neuralgia is a type of headache characterized by piercing, throbbing, or electric-shock-like chronic pain in the upper neck, back of the head, and behind the ears, usually on one side of the head [1].
- The International Headache Society defines occipital neuralgia as a unilateral or bilateral paroxysmal shooting or stabbing pain in the posterior part of the scalp in the distribution of the greater, lesser, or third occipital nerve, sometimes accompanied by diminished sensation or dysesthesia in the affected area [2].
- Etiology of occipital neuralgia can include cervical instability, trauma, **compression** due to vascular abnormalities and mass lesions, due to arthrosis, sclerosis, osteolytic lesions, and Chiari I malformation. Surgeries at the craniocervical junction and upper cervical spine may also cause this syndrome.
- Diagnostic criteria: (1) **Occipital headache** associated with tenderness over the affected nerve branches. (2) **Trigger points** at the emergence of the greater occipital nerve or in the distribution of C2. (3) Pain improved by local anesthetic block of the affected nerve(s) (Fig. 50.1).

Treatment

- Conservative: non-pharmacologic options include heat/cold application, cognitive behavioral therapy, and massage. Pharmacologic options may be preferred by patients over injections or may be used in settings where practitioners are unable to provide occipital nerve blocks. Oral agents have not been systematically studied for their efficacy in occipital neuralgia. Gabapentinoids, tricyclic antidepressants, and baclofen have all been used given their efficacy in other cranio-cervical pain syndromes. Similarly, carbamazepine has been used for paroxysmal occipital pain.
- **Occipital nerve blocks** are often the treatment of choice. They may be diagnostic and therapeutic. Pain relief can last from days to months. They may be performed with or without steroid. The procedure can be repeated as needed, unless steroid is used.
- Botulinum toxin type A injections and peripheral nerve stimulation have been studied in small cases series.
- Surgical decompression of occipital nerve in refractory cases.

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Fig. 50.1 Sensory innervation of scalp and neck. (Drawn by Sophia Haas, B. Arch)



Anatomy (Fig. 50.1)

- The greater occipital nerve (GON) arises from **dorsal primary rami of C2** (with occasional contribution from C3).
- GON passes through the semispinalis and trapezius musculature just inferior to the **superior nuchal line**, then continues alongside the occipital artery superiorly above the fascia and below the galea.
- The lesser occipital nerve (LON) arises from the **ventral primary rami of C2 and C3**.
- LON passes superiorly and laterally from the occiput to the lateral edge of the sternocleidomastoid muscle.
- LON innervates the scalp in the lateral area of the head posterior to the ear.
- The third occipital nerve originates from the third cervical spinal nerve, perforates the trapezius muscle, and supplies sensation to the upper posterior neck and lower occipital region of the scalp, medial to the greater occipital nerve territory.

Greater and Lesser Occipital Nerve Block Indications

- Diagnostic and therapeutic purpose
- Occipital headaches (occipital neuralgia)
- Neck pain felt in the upper back of the neck, potentially referring to the occiput, temporal, forehead, and retrobulbar regions of the head.
- Can be considered in
 - Chronic headaches
 - Cervicogenic headaches

Greater and Lesser Occipital Nerve Block Contraindications

- Coagulopathy
- Allergies to any of the local anesthetics
- Infection of the scalp
- Cervical instability or acute fracture
- Arnold-Chiari syndrome

Greater and Lesser Occipital Nerve Block Technique

Landmark Based

Landmarks (Fig. 50.2) [3]

1. External occipital protuberance
 - (a) Midline occipital highest point (inion) on the posterior-inferior occiput of the skull
 - (b) Insertions for both the nuchal ligament and the trapezius
2. Mastoid process
 - (a) Posterior to the external acoustic meatus
3. Draw a line between the external occipital protuberance and mastoid process
 - (a) GON lies 2/3 along the line, close to the occiput
 - (b) LON lies 1/3 along the line, closer to the mastoid process

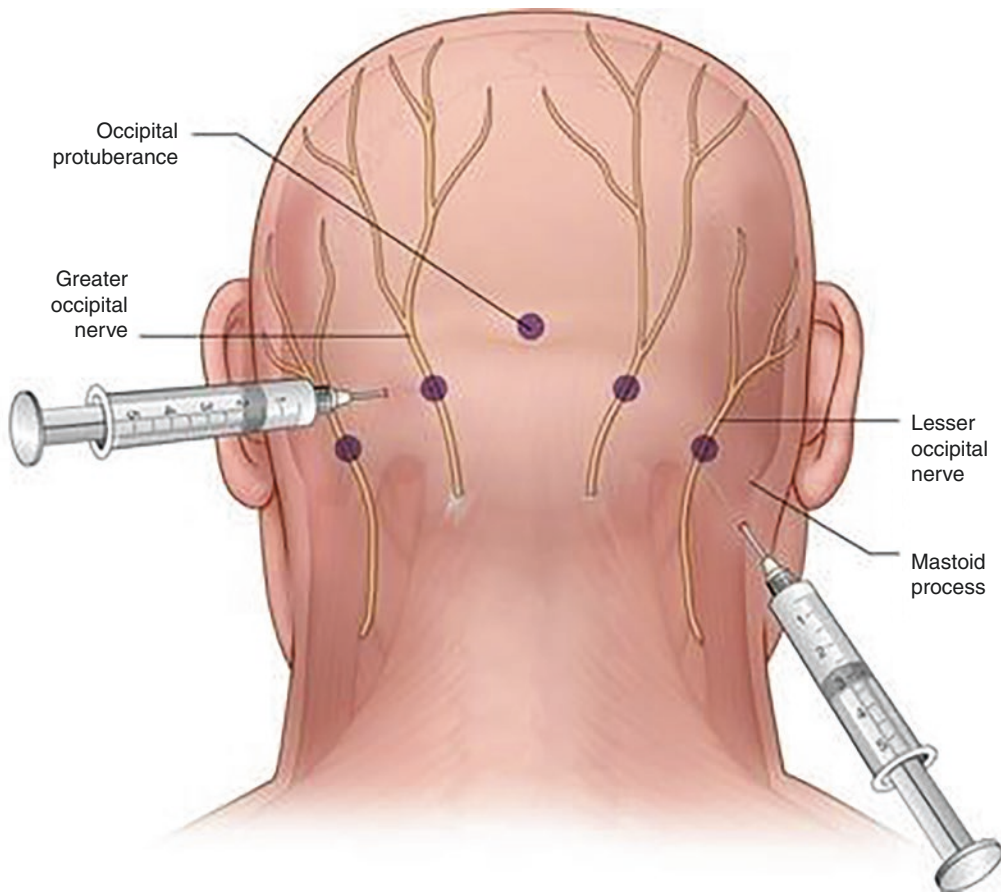


Fig. 50.2 shows landmarks, including occipital protuberance and mastoid process. The image outlines the targets for greater and lesser occipital nerves

Procedure

- Patient in seated or supine position, neck fully flexed
- Locate the external occipital protuberance (see above)
- For GON, injection site is often identified as a point of maximal tenderness and in approximately 2/3 along the line (close to occiput) between the external occipital protuberance and mastoid process.
- Slowly touch periosteum then slightly withdraw needle
- Aspirate to minimize intravascular injection
- Inject 1–2 mL of local anesthetic (steroid can be added)
- For LON, injection site is often identified as a point of maximal tenderness and located 1/3 along the line (closer to the mastoid process) between the external occipital protuberance and mastoid process.
- Slowly touch periosteum then slightly withdraw needle
- Aspirate to minimize intravascular injection
- Injection 1–2 mL of local anesthetic (steroid can be added)

Risks/Complications

- The most common complications include bleeding, bruising, swelling, and soreness at the site of injection
- Infection, local anesthetic toxicity
- Allergic reaction to the medication
- Nerve injury
- Seizure from intravascular injection of local anesthetic
- Headache exacerbation

Clinical Pearls

1. Occipital nerve block (ONB) can be diagnostic and therapeutic

2. ONB is a simple and safe treatment option for occipital neuralgia.
3. Landmark based ONB is simple and safe, though ultrasound guidance can be used (See references [3, 4])
4. In refractory cases, other treatment options include, botulinum toxin injections, radiofrequency ablation, occipital nerve decompression, occipital or spinal cord stimulation

Questions

1. Greater occipital nerve originates primarily from what cervical nerve root
 - A. C2 ventral rami
 - B. C2 dorsal rami
 - C. C3 ventral rami
 - D. C3 dorsal rami
2. Occipital neuralgia typically presents with the following features, except
 - A. Tenderness over the posterior scalp
 - B. Aura prior to the pain
 - C. Pain behind the ear
 - D. Recurring paroxysmal attacks
3. Which of the following is most likely to respond to occipital nerve blocks
 - A. Migraines
 - B. Post herpetic neuralgia
 - C. Cervicogenic headaches
 - D. Myofascial cervical pain
4. Lesser occipital nerves originates primarily from what cervical nerve roots
 - A. C2 ventral rami
 - B. C2 dorsal rami
 - C. C3 dorsal rami
 - D. none of the above
5. The occipital portion of the skull receives sensory innervation from
 - A. Spinal accessory nerve (nerve XI)
 - B. Facial nerve (nerve VII)
 - C. Maxillary branch of trigeminal nerve (nerve V)
 - D. None of the above

Answers

1. B, 2. B, 3. C, 4. A, 5. D

References

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