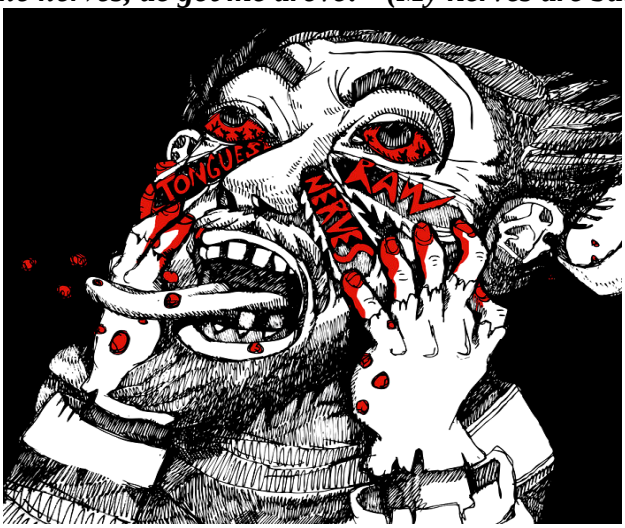
# OCCIPITIAL NEURALGIA AND OSTEOPATHIC MANUAL THERAPY

***"Oh me nerves, de got me drove! - (My nerves are bad!)***[43]




*Raw Nerves -Tongues - Milan, Italy*

By

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## Abstract

Occipital neuralgia is a **rare, chronic, and distinct type of headache disorder with known and unknown origin.** It is commonly known to be caused by inflammation, injury, or compression of the occipital nerves that run from the top of the spinal cord to the scalp, and characterized by persistent piercing, throbbing, or electric-shock-like pain. It is usually unilateral, but could be bilateral in the upper neck, the back of the head, or behind the ears; lasting only a few seconds or for hours.

Conventional treatment for occipital neuralgia consists primarily of neural blockade with local anesthetic and steroid, combined with the use of non-steroidal anti-inflammatory drugs, muscle relaxants, anti-depressants, physical therapy and surgery in severe cases. Manual Osteopathic treatment is an alternative drug-free, non-invasive manual therapy that aims to improve health across all body systems alternative and wholistic approach for treating occipital neuralgia. This is done by manipulation of muscles and by manipulating and strengthening the musculoskeletal framework of the body. It is an alignment of bones, and joints in the head and neck to remove any obstructions, restrictions or compressions that cause dysfunction of the occipital nerves and surrounding muscles; and at the same time allowing fluids such as blood, lymph and Cerebral spinal fluid to flow easily with the intension for the body to self-heal.



## Key Words

Occipital neuralgia, occipital nerves, chronic, nerve compression, migraine, electric-shock-like, pain, nerve block, osteopathy, somatic dysfunction, spinal cord

# Introduction

Occipital Neuralgia is a **rare, chronic, and distinct type of headache disorder with known and unknown origin.** Unlike headaches or migraines, ON can be triggered quickly; it may arise spontaneously for no apparent reason**.** It is commonly known to be caused by inflammation, injury, compression of the occipital nerves that run from the top of the spinal cord to the scalp. Characterized by persistent piercing, throbbing, or electric-shock-like pain, usually unilateral but could be bilateral in the upper neck, the back of the head, or behind the ears lasting only a few seconds or for hours**.** [(1)(8)(11)]

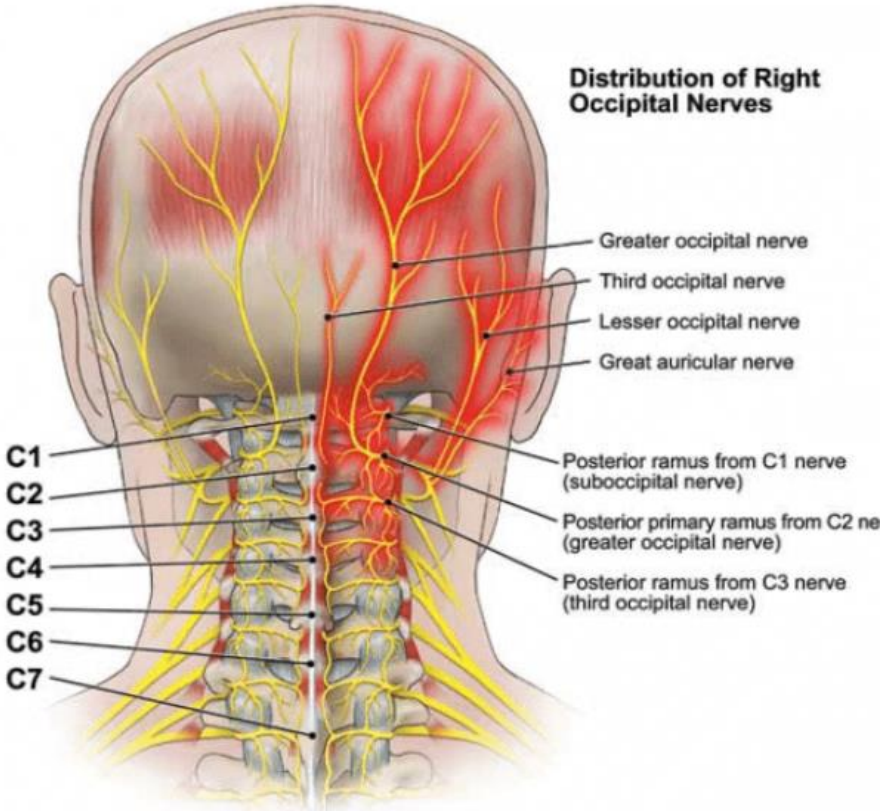



Figure 1 Distribution of Occipital Nerves and corresponding vertebra 2022

# Epidemiology

Occipital neuralgia (ON) is a well-known disorder, but its incidence remains to be accurately determined. A study in the Dutch general population reported a relatively low incidence of 3.2 per 100,000. Female dominance was present but not significant, and no time and seasonal variation was found [3]

According to the Occipital Neuralgia Foundation, **"*3.96 years is the average length of time for someone to be diagnosed with Occipital Neuralgia (ON), and 7.44 years is the average length of time people have had (ON) without finding permanent relief."*** [4]

In January of 2021, the Occipital Neuralgia Foundation teamed up with another nonprofit organization, Patients Rising, to conduct a survey which helped them to learn more about the ON community. The Graphs below illustrates their findings.

## Diagnosis Time:

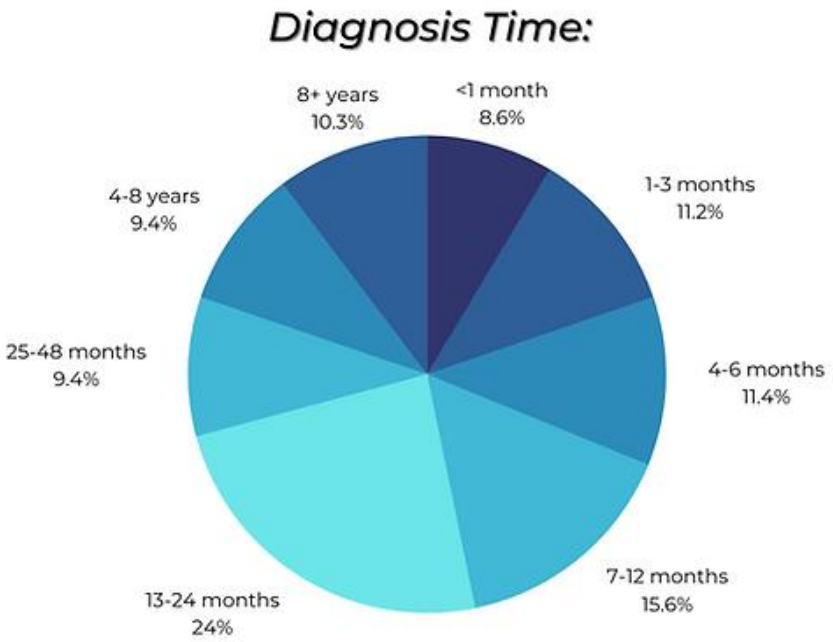



**Figure 2 Courtesy of the Occipital Neuralgia foundation 2023**

Only 46.5% of those who participated in the survey were diagnosed within a year. Occipital Neuralgia is considered a 'diagnosis of exclusion.' In other words, once a full workup has been done on the patient and other ailments have been ruled out, ON should then be considered. They also noticed that it took over 8 years to get diagnosed for more than 10% of the participants. [4]

## Diagnosis & Primary Provider:

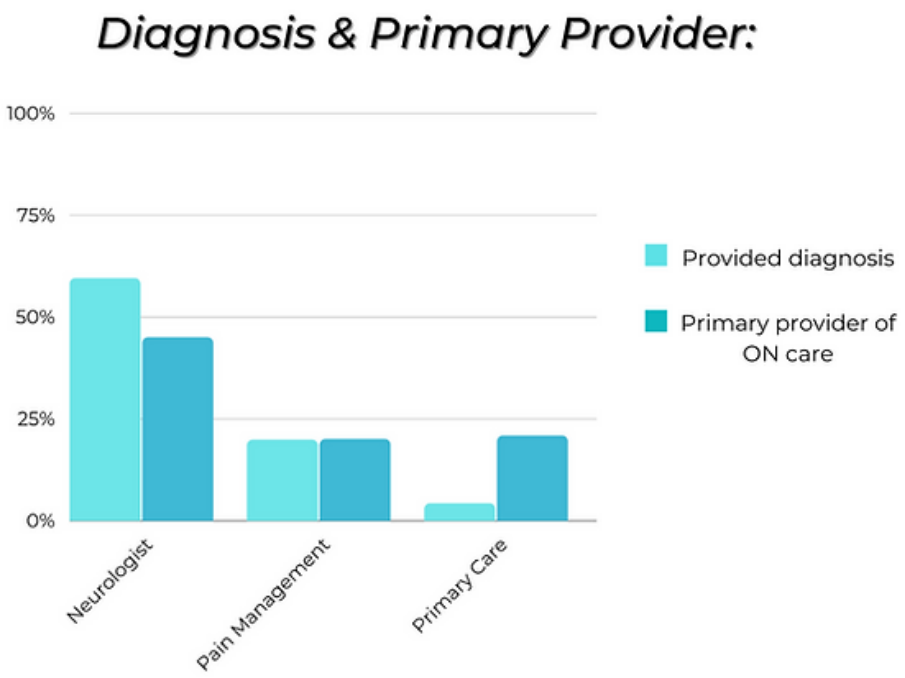



**Figure 3 Courtesy of the Occipital Neuralgia foundation 2023**

They learned that almost 60% of participants were diagnosed with Occipital Neuralgia by a neurologist. However, only 45% of those participants continued under the care of a neurologist. This was very surprising to the groups to see such a low percentage of patients continuing their care with a neurologist, knowing that they are among the first doctors a patient sees with a complaint of head pain. It appears that once patients received a diagnosis of ON from their neurologist, they needed to see a different physician to receive treatment. Only 4% of participants were diagnosed by their primary care physician, however, primary care physicians remain the provider of ON care for over 20% of participants.[(4)]

## Onset of Occipital Neuralgia:

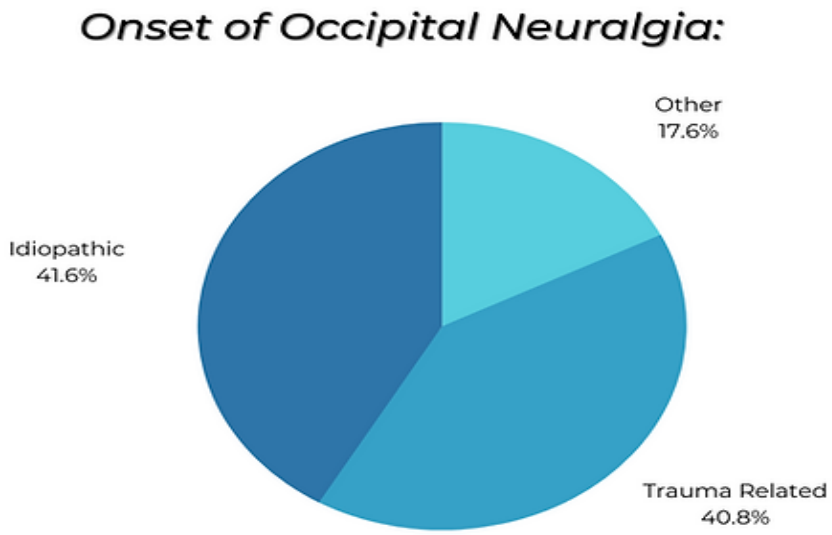



**Figure 4 Courtesy of the Occipital Neuralgia foundation 2023**

The group, (ONF and PR) posed the question "How did your Occipital Neuralgia begin?" 41.6% of participants explained that their symptoms either came on suddenly began gradually, or they did not know. 40.8% of participants were able to relate the onset of their symptoms to a trauma related injury, such as a whiplash injury, concussion, car accident, etc. The remaining 17.6% of participants were able to relate their ON to comorbid states or underlying diseases. Among these diseases were Ehlers Danlos Syndrome and meningitis. ON onset secondary to surgery is also included in the "other" category**.** [(4)]

## Occipital Neuralgia & Pediatrics:


**Figure 5 Courtesy of the Occipital Neuralgia foundation 2023**

There were 7 participants under the age of 18 in the survey. Of those 7 participants, 6 (85.7%) reported "having minimal access to specialists because they were considered pediatric patients." Unfortunately, many of the physicians who specialize in Occipital Neuralgia do not see pediatric patients. The inability to see ON specialists creates another barrier for pediatric patients as they try to navigate their symptoms, pain, treatment, and an accurate diagnosis. **(4)**

# Causes of Occipital Neuralgia

Occipital neuralgia can be the result of pinched nerves, muscle tightness in the neck, a head or neck injury, disc disease, inflammation or infection. ***Occipital neuralgia can either be primary or secondary***. A secondary condition is associated with an underlying disease. People can confuse it with a migraine or other types of headache, because the symptoms can be similar. **(7)(9)**

**Cause of occipital neuralgia includes:**

- Osteoarthritis of the upper cervical spine
- Trauma to the greater and/or lesser occipital nerves
- Compression of the greater and/or lesser occipital nerves or C2 and/ C3 nerve roots from degenerative cervical spine changes
- Cervical disc disease
- Tumors affecting the C2 and C3 nerve roots
- Diabetes
- Blood vessel inflammation
- Infection
- Gout
- Whiplash

# Symptoms

**Symptoms of occipital neuralgia include:**

- Continuous aching
- Burning and throbbing
- Intermittent shocking or shooting pain that generally starts at the base of the head and goes to the scalp on one or both sides of the head.
- Pain behind the eye, on one side of the head
- Dizziness
- Vertigo
- Migraine symptoms
- Sensitivity to light
- Vertigo
- Scalp tenderness
- Pain and tight muscles when moving the neck

# Nerves Anatomy Involvement in Occipital Neuralgia

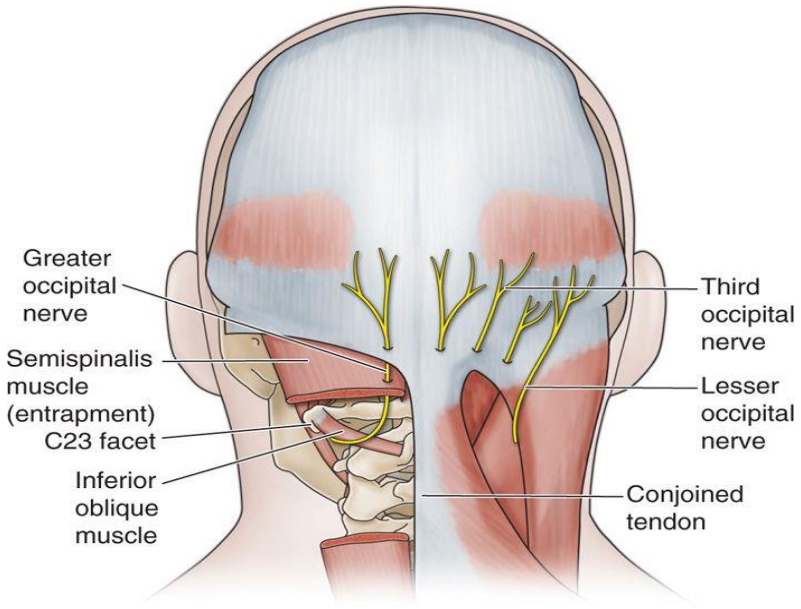



**Figure 6 Posterior primary divisions of the upper three cervical nerves.**

The anatomy of the main nerves that are involved in ON are the greater occipital nerve, the lesser occipital nerve and the third occipital nerve. These nerves emerge from the posterior branches of the first cervical roots, to innervate the muscles of the nape, and provide the sensitivity of the scalp. The Occipital Nerves mainly carries **sensory fibers**, with only the third occipital nerve carrying some motor fibers. The main functions of these nerves are, to provide the sensory supply to the skin overlying the posterior and lateral scalp, including the skin of the external ear. [6] [14]

# Greater Occipital Nerve

## Structure and Function

The **Greater Occipital Nerve** is the biggest afferent spinal nerve of the head, specifically the medial branch of the dorsal primary ramus of cervical spinal nerve 2. It arises from between the first and second cervical vertebrae, ascends, and then passes through inferior capitis oblique and the semispinalis capitis muscle from underneath the occipital triangle. It ascends further to supply the skin along the posterior part of the scalp to the vertex. It supplies sensation to the scalp at the top of the head, over the ear and over the parotid glands. This complex involvement with the nearby musculature may make this a potential source of nerve radiculopathy, compression, or irritation.

**A common site, and usually misdiagnosed area of entrapment for the greater occipital nerve, is at the obliquus capitis inferior muscle.** [6] [14]

# Lesser Occipital Nerve

## Structure and Function

**The Lesser Occipital Nerve** originates from the ventral rami of the C2 and C3 spinal nerves and goes to the occipital region along the posterior margin of the sternocleidomastoid muscle. It pierces the deep cervical fascia close to the cranium and travels upward. Near the cranium, it penetrates the deep cervical fascia and goes superiorly above the occiput to innervate the skin on the side of the head and on the cranial surface of the auricle, and communicate with the Greater Occipital Nerve. The lesser occipital nerve has three branches: the auricular, mastoid, and occipital branches. The lesser occipital nerve **may be compressed by the fascial attachment of the sternocleidomastoid muscle, by branches of the occipital artery, and by fascial bands.** [6] [14] [34]

# Occipital Nerve Third

## Structure and Function

The Third Occipital Nerve is an under-recognized cause of occipital headaches and can sometimes cause headaches with similar characteristics to migraine headaches. The third occipital nerve is a superficial medial branch of the dorsal ramus of the C3 spinal nerve and is thicker compared to other medial branches. The dorsal ramus of the C3 spinal nerve divides into lateral and medial branches. The medial division further divides into superficial and deep branches, of which the superficial division is named the third occipital nerve. [24] [25]

The third occipital nerve travels through the dorsolateral surface of the C2-C3 facet joint. **Based on a study by Tubbs et al., the third occipital nerve was found to send out small branches that travel across the midline and interact with the contralateral third occipital nerve in 66.7% of patients.** [36][34]

The third occipital nerve also perforates the splenius capitis, trapezius, and semispinalis capitis, then communicates with the Greater Occipital Nerve to innervate the region of the skin below the superior nuchal line; after innervating the semispinalis capitis. The third occipital nerve also innervates the facet joint between the C2 and C3 spinal nerves and a portion of the semispinalis capitis. It also provides motor function for the semispinalis capitis. [25]

# Muscle Anatomy Involvement in Occipital Neuralgia

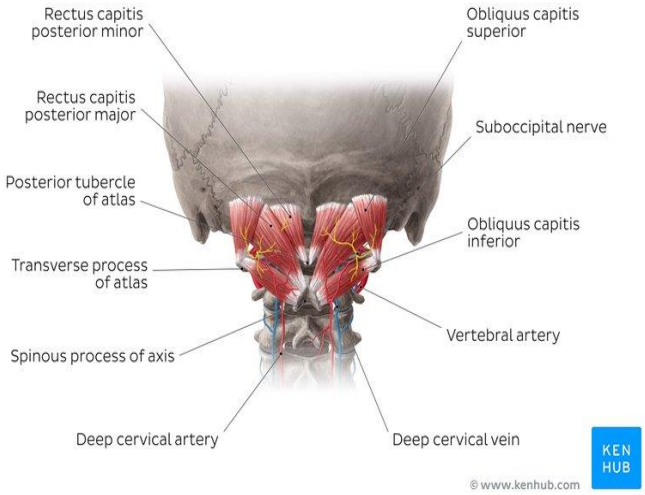



**Figure 7 Muscles of back of the head- courtesy of caring medical.com**

# Obliquus Capitis Superior

## Structure and Function

The **obliquus capitis superior muscle** is a small muscle in the upper back part of the neck and is one of the suboccipital muscles, and part of the suboccipital triangle. It arises from the lateral mass of the atlas bone. It passes superiorly and posteriorly to insert into the lateral half of the inferior nuchal line on the external surface of the occipital bone. The muscle is innervated by the suboccipital nerve; the dorsal ramus of the first spinal nerve. It acts at the atlanto-occipital joint to extend the head and flex the head to the ipsilateral side. **Overuse or incorrect posture often leads to a strain or other injury of the muscles, resulting in neck pain, headaches, or eyestrain**. (6) (26)

Figure 7 Obliquus Capitis Superior courtesy of Ken Hub, 2022

# Obliquus Capitis Inferior

## Structure and Function

The **obliquus capitis inferior muscle** is the only muscle that does not attach to the cranium and is the larger of the two oblique muscles of the neck. It arises from the apex of the spinous process of the axis and passes laterally and slightly upward, to be inserted into the lower and back part of the transverse process of the atlas. It lies deep to the semispinalis capitis and trapezius muscles. The functions of obliquus capitis inferior muscle, like the other suboccipital muscles, have an important role in ***proprioception***. It works alongside the other suboccipital muscles to stabilize the atlantoaxial joint, and thus the position of the head during other body movements, such as standing up from a sitting position. **(6) (27)**

The muscle has a very high density of Golgi organs and muscle spindles which accounts for this. Bilateral contraction of obliquus capitis inferior causes head extension at the atlantoaxial joint, while unilateral contraction produces rotation of the head towards the ipsilateral side, due to the oblique angle of its muscle fibers making, it a strong muscle in rotation of the neck. **This muscle is responsible for Cervical Dystonia, a rare condition that affects the obliquus capitis inferior causing the head to jerk involuntarily without warning to either the left or right, or tilt from ear to shoulder, or back and forth. This painful disorder may cause neck strain and cramping or headaches.** **((27) 30)**

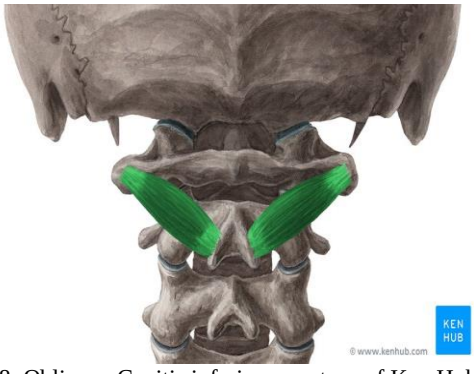



Figure 8 Obliquus Capitis inferior- courtesy of Ken Hub- 2022

# Semipinalis Capitis

## Structure and Function

Semispinalis capitis is a long paired muscle that belongs to the deep layer of muscles of the back**.** It forms the superior and largest component of the three-part semispinalis muscle; semispinalis cervicis and semispinalis thoracis forming the middle and inferior divisions of the muscle, respectively. Semispinalis capitis spans the neck and upper back regions as it runs from the cervical and thoracic vertebrae to the occipital bone. Its muscle tendons arise from the articular processes of vertebrae C4-C7 and transverse processes of vertebrae T1-T6. From these attaching tendons, the muscle fibers of semispinalis capitis converge into a single muscle belly that runs superiorly across the lateral side of the vertebral column. The muscle inserts onto the occipital bone, between superior and inferior nuchal lines and posterior to the insertions of obliquus superior, rectus capitis posterior major and rectus capitis posterior minor muscles.[38]

Semispinalis capitis muscle receives its innervations through the greater occipital nerve (posterior ramus of C2 spinal nerve) and spinal nerve C3. Blood supply comes from the occipital artery that arises from the external carotid artery. Regarding function, semispinalis capitis assists obliquus capitis superior, splenius, trapezius, rectus capitis posterior major and rectus capitis posterior minor muscles to extend the head, cervical and thoracic spines. Unilateral contraction, however, results in ipsilateral lateral flexion of the head, cervical and thoracic spine, contralateral rotation of head, and cervical and thoracic spine. The outer surface of semispinalis capitis is covered by splenius capitis muscle, while its inner surface overlies semispinalis cervicis muscle. Semispinalis muscles are located medial to longissimus muscle, which comprises the central cord of erector spinae muscle. [16]

**Headache can occur due to the entrapment of the greater occipital nerve in the aponeurosis of the superior trapezius or semispinalis capitis muscle or may be a referred pain without nerve compression from trigger points in these or other suboccipital muscles.[41]**


**Figure 9 Semispinalis Capitis muscles courtesy of Ken Hub-** December 05, 2022

# Rectus Capitis Posterior Major

## Structure and Function

Rectus capitis posterior major muscle is one of four small suboccipital muscles; the others being: Rectus capitis posterior minor, Obliquus capitis inferior and Obliquus capitis superior. When both muscles contract bilaterally they act to extend the head on the neck, while the unilateral contraction rotates the head ipsilaterally at the atlanto-axial joint. Rectus capitis posterior major muscle is triangular in shape. It attaches to the spinous process of axis deep to obliquus capitis superior and semispinalis capitis muscles. It's fibres passes superolaterally, skipping the first cervical vertebra, to insert via a broader attachment on the lateral part of the inferior nuchal line and the occipital bone directly below it. Rectus capitis posterior major is located lateral and superficial to rectus capitis posterior minor, while deep and medial to obliquus capitis superior. Also, rectus capitis posterior major muscle forms the superomedial boundary of the suboccipital triangle. **(38)**

Rectus capitis posterior major muscle, along with the other suboccipital muscles and semispinalis capitis, are innervated by suboccipital nerve (the first cervical posterior ramus). Its blood supply 1sfrom the vertebral artery and deep descending branches of the occipital artery. The vertebral vein is responsible for its venous drainage through the posterior external vertebral venous plexus. Rectus capitis muscle is involved in extension of the head on the neck. Working bilaterally, this muscle produces extension at the atlanto-occipital joints, while when working unilaterally it produces atlanto-axial rotation of the head (along with obliquus capitis inferior and splenius capitis) towards the ipsilateral side. Moreover, rectus capitis posterior major stabilizes the atlanto-occipital joint during movements, making it an important postural muscle. **(34) (38)**

**Due to its location, a car accident or whiplash can cause severe damage to this muscle. It is prone to strains, atrophy, ruptures, lacerations, tears, infections, contusions and even neuromuscular disease. (38)**

**Figure 10 Retus Capitus Posterior Major Muscles courtesy of Ken Hub- December 15, 2022**

# Rectus Capitis Posterior Minor

## Structure and Function

Rectus capitis posterior minor means ‘lesser posterior straight muscle of the head.
Rectus capitis posterior minor has a pyramidal shape. It originates from the posterior tubercle of atlas (C1) via a narrow and pointed tendon. The muscle travels in a superolateral direction, fanning out to a broader attachment onto the medial part of the inferior nuchal line located on the occipital bone, and is located in the suboccipital muscle compartment. This compartment is located inferior to both the external occipital protuberance and inferior nuchal line of the occipital bone, and is the most medial suboccipital muscle; located on either side of the midline. [38]

The membrane is directly attached to the overlying rectus capitis posterior minor muscle by a soft tissue structure. Rectus capitis posterior minor is innervated by the suboccipital nerve, also called the posterior ramus of the first (C1) spinal nerve. The suboccipital nerve reaches rectus capitis posterior minor by traveling between the cranium and the atlas. It extends across the atlantooccipital joint, thus, when both muscles contract bilaterally they act to extend the head on the neck. This action has an important postural role; stabilizing the head while standing and during various body movements. The muscle also stabilizes the atlantooccipital membrane. [34] [38]

**Studies have shown that various changes of the rectus capitis posterior minor specifically (hypertrophy, tension, atrophy, trauma) can irritate the highly sensitive dura mater by acting via the myodural bridges. Resultant pain can manifest as chronic headaches** [11] [42]

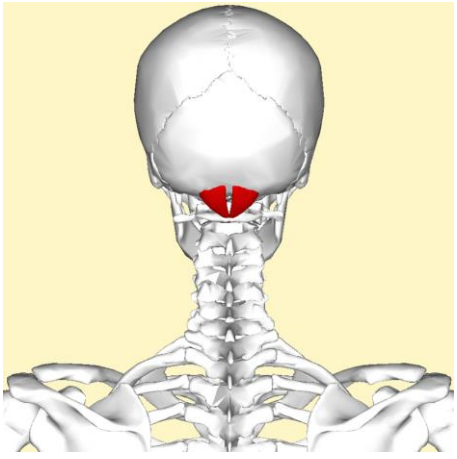


**Figure 11 Rectus Capitis Minor Muscle- courtesy of By Anatomography- Dec. 2, 2022**

# Conventional Diagnosis and Treatment

## Diagnoses

Diagnosing Occipital Neuralgia can be difficult because true occipital neuralgia is rare and the condition causes many of the same symptoms as migraines and other headache disorders, therefore, no one conclusive test to confirm the disorder. Typically, a physical examination and neurological exam will be done to look for abnormalities. If the physical and neurological exams are inconclusive, a doctor may order further imaging to rule out any other possible causes of the pain. A magnetic resonance imaging (MRI) test may be ordered, which can show three-dimensional images of certain body structures and can reveal any impingement. A computed tomography scan (CT or CAT scan) will show the shape and size of body structures. Some doctors may also use occipital nerve blocks to confirm their diagnosis. [7][23][30][31]

## Treatment

Treatment of occipital neuralgia aims to alleviate the pain; however, it is not a cure. Interventions can be surgical or non-surgical.

### Non-surgical treatment may include:

- **Hot therapy** or using heating pads on the affected area.
- **Physical therapy**- to help muscle relax, an remove scar tissues
- **Botulinum toxin** -injections to decrease inflammation.
- **Anticonvulsants**, drugs to treat seizures or other brain over activity.
- **Muscle relaxants**.
- **Non-steroidal anti-inflammatory drugs**.

- **Nerve blocks** are an injection of numbing medication and steroids. Nerve blocks can be used as both a diagnostic tool and as a form of treatment. A less invasive option is the use of a nerve block to prevent pain signals from the nerves from reaching the brain. These blocks are an injection solution, usually containing a long-acting local anesthetic and a steroid anti-inflammatory drug. The infusion itself may be somewhat uncomfortable, but pain relief often occurs within 15 minutes and can last from a few days to weeks, and even up to months. Sometimes the pain doesn't recur at all, and complications of nerve blocks are considered rare, when the procedure is performed by an experienced provider. After-effects may include some temporary numbness in the regions of the scalp and head supplied by the nerves, and, sometimes difficulty speaking or swallowing for a few hours. [18][23]

If your symptoms persist after trying non-surgical treatments; surgery is the next recommend option.

## Surgical treatment for occipital neuralgia includes:

- **Occipital nerve stimulation:** Placing electrodes on your occipital nerve to stop pain signals from reaching your brain.
- **Spinal cord stimulation:** Placing electrodes on your spinal cord to block pain signals from reaching your brain.
- **Nerve Decompression Surgery**
  Nerve decompression surgery is typically performed by reconstructive surgeons who specialize in nerve issues. Through this surgery, the occipital nerves are "released" from the scar tissue, fascia, muscle tissue, etc. that was compressing them.
- **Neuro Stimulator Implant** (i.e. Omega Procedure/Reed Procedure)
- Neurostimulators have been described as a "pacemaker for pain." They consist of a battery with multiple leads. The battery is usually placed in the chest while the leads are placed in the areas of pain, whether it is the forehead, back of head, or both. The leads are connected to a battery pack, which is placed beneath the skin, usually in the chest. Electrical impulses are sent to interrupt the pain signals from reaching the brain. A remote control is used to adjust the frequency, duration, intensity, etc., of the impulses to best suit the pain levels. A trial is conducted first, with temporary lead placement and an external battery, to see if it is a helpful way to reduce the pain. If successful, then consideration for a permanent implant can be discussed. [23] [25][29]

# What Is Osteopathic Manual Therapy?

Dr. Andrew Taylor Still (founder of Osteopathy in 1874), uses a drug-free, non-invasive manual therapy, that aims to improve health across all body systems by manipulating and strengthening the musculoskeletal framework. Dr. Still was dissatisfied with the in-effectiveness of 19th century medicine. He believed that many of the medications of his day were useless or even harmful.[22] Dr. Still says in his book 'Osteopathy Research and Practice', "I love the old doctors for their faithfulness. The medical doctor reasons that the body has chemicals in it that have to be met with other chemicals or poisons. The drugs which are chemical products have been administered according to his direction and have failed to relieve a suffering head, neck, chest, abdomen, pelvis, or any organ." (Osteopathy Research and Practice, Pantianos Classics, 1910)[42]

He was one of the first, of his time, to study the attributes of good health so that he could better understand the process of disease. He believed that osteopathy was a necessary discovery to treat medical disorders in the body. He termed these medical disorders as ***osteopathic lesions. This term has evolved over the years to what is now known as somatic dysfunction in the osteopathic community.*** It is defined as impaired or altered functions of related components of the somatic (body framework), which include the musculoskeletal, nervous, or lymphatic systems.[22]

Osteopathy is founded on a set of principles or tenets stating that the body is a unit. Its main goal is to promote the natural healing process of the body, by using various hands on techniques or manipulations, such as: Joint Mobilization, Muscle Energy, and Soft Tissue techniques, which are used to promote the function and circulation of a localized or generalized area of the body.

### The Four Principles of Osteopathy

- The body is a unit; the person is a unit of body, mind, and spirit.
- The body is capable of self-regulation, self-healing, and health maintenance.
- Structure and function are reciprocally interrelated.
- Rational treatment is based upon an understanding of the basic principles of body unity, self-regulation, and the interrelationship of structure and function.

## Manual Osteopathy, an Alternative therapy for Occipital Neuralgia

In order to prevent alterations of the musculoskeletal system, the areas of activity and competence of the professional profile include: (1) osteopathic assessment through observation, perceptual palpation, and osteopathic tests to detect the presence of clinical signs of somatic dysfunction (SD) in the musculoskeletal system, (2) Osteopathic treatment by selecting purely manual osteopathic approaches and techniques appropriate to the patient and clinical context, (3) Osteopathic treatment outcome assessment, verifying their appropriateness, planning follow-up, and sharing them with the patient, and (4) Patient education for proper self-management within a multidisciplinary perspective. [20][21] [39]

### Joint Mobilization

- Joint Mobilization (MOB) which works by stabilizing one segment of a joint and applying manual pressure or traction to the nearby section. This applied force is usually directed in a plane of motion that is very tight, or hypomobile, in an effort to improve overall joint function.[19] [20]

### Muscle Energy Mobilization

- Muscle Energy (MET) is designed to improve musculoskeletal function through mobilizing joints and stretching tight muscles and fascia, to reduce pain, and to improve circulation and lymphatic flow. [19] [20]

### Soft Tissue Therapy

- Osteopathic Soft Tissue therapy is an effective way to eliminate knots, adhesions and Scar tissue, in order to restore biomechanics, optimize movement and improve performance; by treating either a muscle or group of muscles tendons, ligaments and fascia. Once the muscle or tendon, ligament, and fascia has been relaxed or "released" then the technique has accomplished its purpose. [19] [20]

# Treatment Sequence

**treatment The sequence entails**

**First**, the patient fills out a Health History Questionnaire intake form.
A sit-down type interview discussion is conducted with the patient by the manual osteopath (MO). This is to gather more information about the patient's complaint.

**Sample Questions**

- What brought on ON?
- When did it happen, and for how long they've had ON?
- Was it caused by trauma, like a car accident, fall, blunt force to the head
- How would they rate their pain on the pain scale of 0 being no pain and 10 being the worst pain
- Ask patient to show exactly where their pain is located? Patient shows where and OM asks for permission to check the location.
- Was it brought on suddenly or gradually?
- Described their pain? Is it sharp, dull. Achy, pins and needle-like, numbness? On would exhibit stabbing knife-like, persistent piercing, throbbing, or electric-shock-like pain
- Have they seen a doctor, or any professional for care? Be it allopathic or alternative? If so, whom, for how long, and when?
- What aggravates, and what alleviates their pain?
- Have they had any Diagnostic exams done (X-rays, Ultrasound, MRI, etc.)?
- Does the pain radiate to any part of the body?
- Does the pain affect any other part of the body? If so, where? Have patient show where on the body pain located.
- In the case of ON, it would the back of the head, top of the scalp of the head, behind the ear, and eye of the affected side or sides.
- Do they have any diseases, such as; Tumors affecting the C2 and C3 nerve roots, Diabetes, Blood vessel inflammation, Infection, Gout, Heart Disease, High Blood Pressure, etc.?
- Any change of are sure to as if they could be pregnant?(women)

These are just some of the questions that the MO would ask the patient to help with osteopathic differential diagnosis (MODD), which will direct the MO with the assessment portion of the appointment

**Second**, the Manual Osteopath (MO) would then thoroughly explained the benefits and possible risk of treatment; giving the patient the power to make an informed decision to proceed, or not to proceed with the osteopathic assessment. For example; after treatment the patient may or will experience a decrease in pain and inflammation, increase range of motion, increase in "feel good" hormones like, endorphin, oxytocin, and increase in lymph, blood and cerebrospinal fluid flow. The patient may also experience soreness or a headache for a short while.

Older patients may experience, severe pain, rib fracture in patients with osteoporosis, numbness, and tingling. Again theses are rare, but must be disclosed to the patient. If patient decides to proceed with the assessment, a verbal and written consent is obtained by the MO and is documented in the patients file. The MO would then conduct a thorough assessment on the affect body part.

## Assessment Exam

Postural Assessment assesses for symmetry and alignment of the body in an anatomical position from an anterior, posterior, and lateral view. A gait exam is also performed to rule out neurological pathologies.

**Range of Motion Assessment** is also conducted. This exam is a must. The MO would have the patient perform cervical flexion, extension, lateral flexion, and rotation to ascertain if there are any restrictions or limitations. In Active Range of Motion (ROM) the patient does the movement them selves, and in Passive Range of Motion (POM), the MO does the movement for the patient. Cervical flexion of the head is 50-60 degrees, extension 70-80 degrees, lateral flexion is 45 degrees. If movement of the cervical spine is less then these estimated ranges; it is considered be in restricted or decreased range of motion.

After which **Visual and Palpation Exams** is conducted on the patient to assess for any osteopathic lesion- size, shape, colour change, consistency, muscle tone- hypertonicity or hypotonicity, temperature changes, skin drag, and red reflex adhesion or scar tissues, texture, location- localized or diffused, and pain or tenderness. This exam is a must!

Special **Orthopedic Tests** like Spurling test or Spurling compression test can be used to assess for cervical radiculopathy of the cervical spine.

### Spurling test A

Patient seared on, OM will bend patient's head toward the affected side of the body where patient have symptoms then apply axial pressure to the top of your head.

### Spurling test B

In addition to bending patient's head toward symptomatic side, MO will extend and rotate the neck while applying axial pressure to the top of patients head.

A positive Spurling test result means patient will feel pain radiating into the arm during the test. MO should stop the test as soon as patient feels pain.
Depending on patients' symptoms, the MO might do some additional testing to confirm the test results.

### Shoulder abduction test.

This test involves placing the palm of patient affected arm over the top of their head. If symptoms go away when patient does this, it's considered a positive result.

### Upper limb tension test

There are a variety of upper limb tension tests that are designed to place stress on the nerves that run from the neck and down the arm. During these tests, each nerve is stretched (stressed) to see if the patient's symptoms are produced.

However, the most accurate tests are diagnostic tests which are usually ordered by the patients' doctor or specialist. Such as X-rays, to determine whether there is any narrowing of the vertebra at the top of the spine, where the occipital nerves pass to the back of the head; or an injection of anesthetic called a nerve block (gold standard). This is given at the base of the skull around the occipital nerve itself. If blocking the occipital nerve results in resolution of the symptoms, the diagnosis of occipital neuralgia is usually confirmed. **(9) (12) (13)**

**Third**, the MO creates a treatment plan from the clinical impression or manual osteopathic diagnosis findings, then present this plan to the patient. By doing so, the MO gives the patient the option to make an inform decision to accept or not to accept the proposed treatment plan. If the patient accepts the plan, then the next step is to obtained consent to proceed with treatment. If the patient does not agree with the treatment plan, the MO is to refer the patient to the appropriate healthcare professional. This is done with the patients permission. The healthcare professional could be another colleague or another healthcare provider.

**PATIENT TREATMENT PLAN**

**Patient name:** **Manual Osteopath Name:** **Date:** **File #**
**Address** **Clinic name, address, phone number**
**Phone number** **License Number#**

| **Date** | | | | |
|---|---|---|---|---|
| **Initial Exam** | **ROM- active /passive**<br><br>**Orthopedic testing** | **Muscle Palpation for hypertonicity** | **Muscle Palpation for pain and static Joint play** | **Clinical Impression/osteopathic diagnosis** |
| **Follow up treatments frequency** | **1 treatment wkly for 3 wks** | **2x treatment wkly for 2 wks** | **1x wkly for 3 wks** | **2 treatment x wkly for 4 wks** |
| **Re-assessment** | **1st week** | **2nd week** | **3rd week** | **4th week** |
| **Type of treatment (MOB,METS,STT)** | **MOBs- for mins** | **METs – for mins** | **SST's – for mins** | **Other** |
| **Remedial exercises (stretches)** | **stretches** | **Weight exercises** | **swimming** | **other** |
| **Nutritional** | **Drink of water after treatment** | **Maintain a balance diet** | | |
| **Notes** | | | | |

**Figure example of patient treatment plan created by Petula Jennings, May 28, 2023**

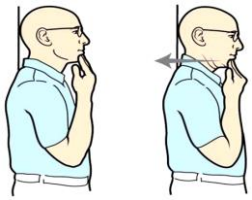
# Home Exercises for Occipital Neuralgia

Leading an inactive lifestyle, particularly sitting for hours while in a slouching position, can gradually weaken your occipital muscles. Maintain proper posture when sitting by keeping your ears in line with your shoulders, rather than too far forward. Some exercises can be too challenging if you have intense, chronic neck pain or migraines. Your doctor may recommend different exercises for your neck. (42)

These exercises and help to strengthen the deep cervical flexors, lower cervical extensors, and other muscles that keep the head pulled back in good posture. They Strengthen the muscles that align the head over the shoulders (upper thoracic extensors), and stretches the scalene and suboccipital muscles. **(42)**

## Neck Retraction (Chin tucks)

Tuck your chin in using 2 fingers of one hand.
Place your other hand on the back of your head and apply a gentle force down as you pull your head towards your chest.
When you feel a stretch at the back of your neck, hold the position for 20 to 30 seconds.
Repeat this stretch 3 times.
Keep your chin tucked as you do this stretch. **(41)**



norburgchiro.com, 2023

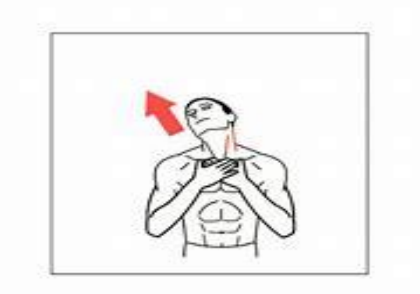
## Prone Cobra

Lie face down on the ground, a towel positioned underneath your forehead. Place your arms at your sides, palms against the ground and above your shoulders. Pinch your shoulder blades together and gently bring your arms off the ground. Lift your forehead an inch off the towel, your eyes looking down at the ground. Hold this position for 10 seconds, and try to perform this exercise 5 to 10 times. The prone cobra strengthens the muscles of the shoulder girdle as well as the neck and upper back. **(41)**

Cobra Pose Yoga stock illustrations May, 2023

## Platysma and Scalene

Place hand under clavicle (collar bone), then place other hand on top of first hand, look up and turn head to opposite shoulder using hands to apply slight downward pressure. You should feel a stretch. Hold for 5-10 seconds, and repeat 5-10 times. [36]



Scalene/platysma stretch – Pt helper.com

## Suboccipital Release with Tennis Balls

Place two tennis balls side by side in a sock.
The sock provides padding.
Lie back, placing the tennis balls just below the base of your skull.
The tennis balls will apply pressure directly into the suboccipital muscles of the neck.
These are the headache muscles.
It's important to use tennis balls and not a hard ball, such as a golf ball.
Hold the position on a tender spot. [41]


## Back Burn

Stand with your back against a wall and your heels 4 inches from the wall. Pull your head straight back so that it touches the wall. Then place your arms against the wall, with the back of your hands touching the wall, at shoulder level. Keeping your arms in constant contact with the wall, slowly bring your hands over your head, and then back down to shoulder level. Repeat this exercise 10 times. The back burn strengthens back muscles and helps open up tight chest muscles. [41]

# Conclusion

Occipital neuralgia can be very difficult to diagnose because of its similarities with migraines and other headache disorders. Therefore, it is important for sufferers of ON to seek medical care when experiencing unusually sharp pain in the neck or scalp and the pain is not accompanied by nausea or light sensitivity. Patient is encouraged to keep in communication with their primary care physician. The gold standard for confirming and treating occipital neuralgia is the Occipital Nerve Block. It is considered non-invasive and non- surgical, and can last for hours or up to a few months. On the other hand, Osteopathic Manual Therapy is also non- invasive and non- surgical in nature, with the added touch of relaxation, effective, therapeutic and gentle mobilization, stretches to remove restrictions and scar tissues, reduced pain and inflammation, increase blood, CFS fluid, and lymph flow, and relieve stress.

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