



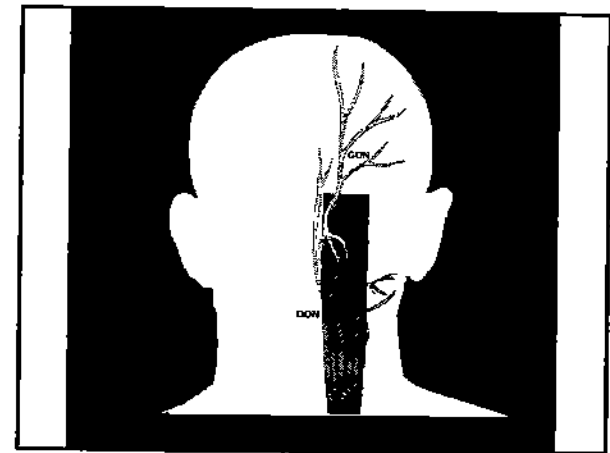
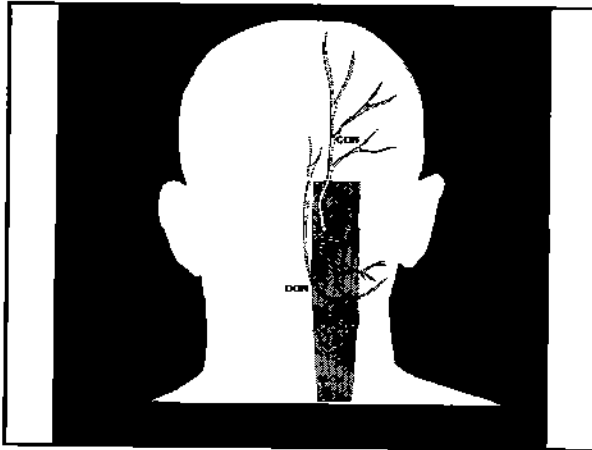
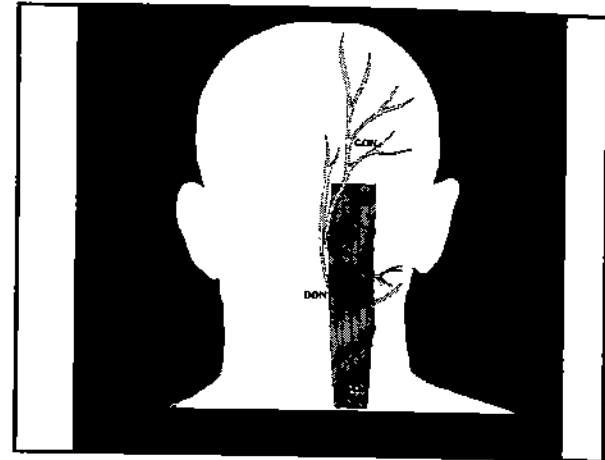
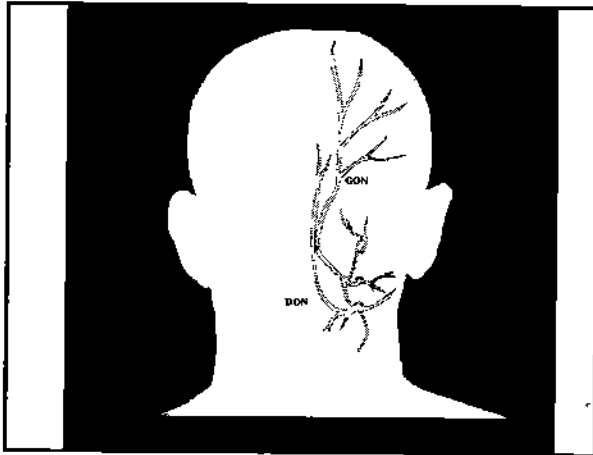
Nerve Decompression Surgery for Chronic Headaches

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Objectives: Define the appropriate patient for possible occipital nerve decompression; List the risks and benefits associated with the procedure.



Pathophysiology of occipital nerve compression, pt 1

- Embryologic anatomic abnormality
- Passage of the Greater Occipital Nerves through the Semispinalis Capitis Muscle
- Compression of the nerve within the muscle and at fascial attachments of the trapezius and other muscles at the occipital ridge

Pathophysiology of occipital nerve compression, pt 2

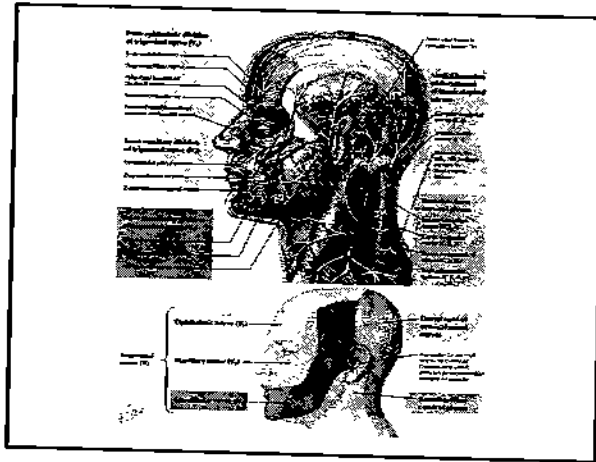
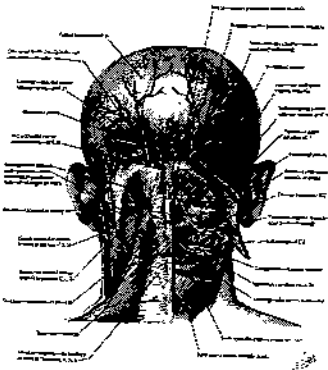
- Overlying inflammatory response
- Progressive accumulation of inflammatory tissue that thickens, adding to compression of the nerves (? Reflecting progressive worsening of headaches over time?)
- These changes are visible at surgery and potentially reversible with decompression

Occipital Nerve Decompression for Chronic Headache

Pathology and Clinical Presentation of Occipital
Nerve Compression Headache

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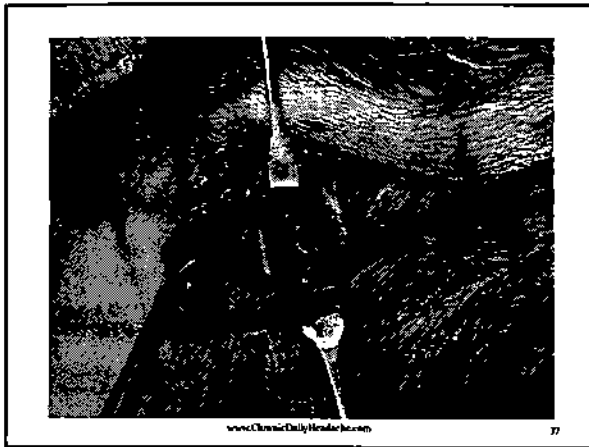
anatomy



Connections of superficial and intracranial nerves

- Brainstem – cervical nuclei and trigeminal brainstem nuclear complex
- Suture lines: in rats and humans, extension of trigeminal nerve fibers from the trigeminal ganglion to the dura, through the suture lines and emissary canals of the skull, innervating outer periosteum, temporalis muscle, and neck muscles
- ?overlap of superficial nerves and migraine features?

pathophysiology



History of Occipital Nerve decompression surgery

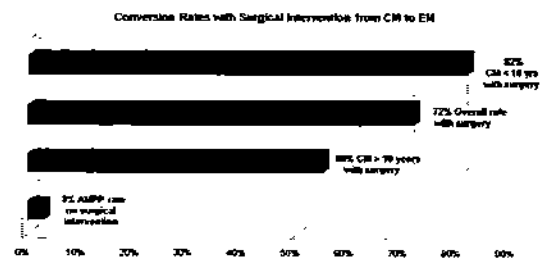
- 1992: Bovim et al, *Headache*. 50 pts, local anesthesia. Avg 14 months follow-up, 56% had benefit from surgery.
- 1996: Magnusson et al, *Headache*. 13 pts, local anesthesia. Avg 28 months f/u, 12 pts report good-excellent relief of pain.
- 2004; Gille et al, *Spine*. 10 pts, deeper surgical decompression, esp Inferior Oblique muscle. Avg 37 months f/u, pain had reduced from 7/10 to 3/10. 7 pts satisfied with results.

results

Results of occipital nerve decompression

- Carlton Perry, MD, board-certified plastic surgeon with extensive reconstructive exp
- 450 patients since May 2007
- Overall 70% of patients improve - defined as greater than 50% reduction in headache severity
- Patients with severe headaches less than 10 years - 83% improve
- Improvement is usually gradual, over several weeks to months

Blake/Perry experience



patient selection

Criteria for referral for nerve decompression surgery

1. High level of confidence in nerves involved
2. High level of confidence that anatomic compression of nerve(s) is the main cause of the headache (not psychological or muscle spasm)
3. Pain for at least 6 months
4. Affecting quality of life
5. Conservative methods failed (nerve blocks, 3-4 preventatives, muscle relaxants, ? Botox)

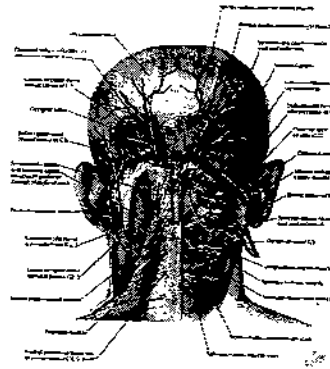
The steps: Correct patient selection is critical to success

1. Know the anatomy
2. Get the history - look for specific features
3. Do the exam - look for findings of nerve involvement
4. Consider and exclude or treat other factors
 - Neck muscle spasm or dystonia
 - Psychological

The steps: Correct patient selection is critical to success

5. Use nerve blocks to confirm involved nerve location, if not done
6. Conservative treatment , if not done
7. Refer for surgery
8. Monitor after surgery for muscle involvement, psych effects

1. Know the anatomy



Occipital nerve distribution of pain: Blake experience

- Usually – but not always - prominent component of pain in the occiput
- Pain will often radiate in the dist of the nerves, either up the back of the head to the vertex or over the top of the ear to the temples
- Pain will often be felt in the forehead (upper forehead – vertex) and behind the eyes
- Rarely pain is **only** in the front or temples

2. History

2. Get the history – look for specific features

- ***Frequency.** Usual response- daily , constant. If pt reports h/a are episodic, ask how head feels in between headaches- typically pt will say there is a constant sensation or pressure at the nerve site “always a little something...”
- ***Duration.** Typically constant or almost constant, pain-free episodes usually only with treatment (can mimic MOH)
- ***Location.** As above. Pick up long hair to look at the head. Be specific, do not allow pt to be vague. “Use one finger...”

History

- ***Character.** Variety of characteristics, most often pressure or tightness, sometimes burning, shooting ‘neurogenic pain.’
- Head is often tender to touch, **hurts to put head on pillow** (“pillow sign” – changing pillows, buying new pillows, need to travel with a specific pillow), hurts to rest head against back of sofa, etc.
- Ask if pt does not volunteer

History

- ***Severity.** No typical severity – varies a lot. Often fluctuates, often severe in the morning, *wake up with pain at night, have to get out of bed, maybe sleep in recliner.
- ***Associated symptoms.** Nausea, vomiting, blurry vision. Neck muscle tightness.
- ***Triggers** – usually not specific triggers as pain is usually constant. **Often worse with typical migraine triggers such as menses, bright lights, strong smells, stress,**

History

- ***Aggravating factors.** Turning head to the side, touching head, pressure on head (CPAP mask, hard hat, ball cap, headband). *Physical activity that activates traps – lifting, housework, keyboard.
- ***Alleviating factors.** Ice to the occiput- *sleep on ice pack, massage of neck muscles
- ***Medications** for acute. Triptans often help! NSAIDs may be helpful, opiates.

History

- **Preventatives.** *Usually history of failure of preventatives although pregabalin may be helpful. May have had initial good response to meds but then lose response.
- **Muscle relaxants.** Often may have some benefit.
- ***Effect on life.** Usually significant and bad- missed school, work, pt often tearful discussing this.

3. Physical exam

3. Examine for nerve tenderness

- With pt seated and you standing beside pt, hold the forehead to stabilize the head and palpate the lesser and then the greater occipital nerves.
- Check the uninvolved or less involved side first. Watch the pt's face for response to pain. Know the normal response.
- Then palpate the trigeminal nerve branches. Try to reproduce pain. Spend a few minutes on this.

Physical exam

- Palpate for several seconds. It may cause discomfort but this will be diagnostically very helpful.
- Ask the pt a few minutes later how the head feels if he does not volunteer.
- At the next visit the pt may volunteer (or if he does not, ask) how the head felt for the next few days. Often prolonged palpation will cause bad headaches.

4. Rule out other factors

4. Consider other factors – muscle, psych

- Neck muscle tightness is always involved and in some pts there may be true cervical dystonia present.
- You must know the usual amount of reported spasm to distinguish in pts with higher than usual spasm. Look for head tilt, turn, measure range of motion.
- Try extended release cyclobenzaprine. Consider Botox if the neck muscles are severe and a factor. (200-300 units to the traps)

Consider other factors

- Psychological. Big confounding factor. Some degree of anxiety or depression is usually present due to the pain and effect on life.
- Referral to therapist
- Neuropsych eval for PD, severe anxiety. The more time you spend working with pt leading up to possible surgery the better.
- Sometimes impossible to differentiate as depression and anxiety very common.

5. Nerve blocks

5. Perform nerve blocks to localize and confirm nerve involvement

- Based on the history and physical, you will usually have a sense of what nerves are involved. If those nerves have not been previously blocked, proceed to blocks.
- Do one set of blocks to LON and GON with bupivacaine hydrochloride/methylprednisolone.
- Do not make any other changes in meds, no other variables (no chiro, OC change, no severe stress)

5. Perform nerve blocks

- Have pt return 2 weeks later, I usually repeat block even if first one not successful. If first one is successful, use the second to confirm - reproduce. Pt keep Log.
- Lack of response to ONB does not rule out ON pathology or + response to OND
- For frontal nerves block the ZMT and STN.
- For temple pain may have to do separate blocks to LON and ZMT. Instruct the pt clearly how to evaluate response to blocks, keep log.

6. Other conservative treatments

6. Try conservative methods

- Lyrica if not tried
- Muscle relaxants
- Therapy for stress management
- Nerve blocks
- Reassurance
- Frequent follow-up visits
- If this fails...

7. Surgery

7. Refer for surgery

- Typically I refer earlier, when I am considering this as an option, for pt to get comfortable with the idea, to educate pt about the nerve pathology, and to check with insurance
- No steroid blocks within 6 wks of surgery
- 5 days post-op visit to discuss usual slow, gradual reduction of headache, increase when numbness wears off, need to minimize muscle activity
- Post-op physical therapy, mgmt of paresthesias

8. Peri-operative and post-operative management

8. Post-operative management

- Caution pt about need to avoid excessive muscle activity. Physical therapy.
- Massage of incisions to prevent scarring.
- Minimize stress
- Do not stop meds right away, wait until headaches are clearly getting better, usually 2-3 months post-operative

8. Post-operative management

- If headaches worsen, almost always due to muscle activation or stress – watch esp with return to work or school, ease into this
- Management of lingering headaches- either due to occipital nerves (?nerve damage) or migraine
- Ease back into physical activity

conclusion

Conclusion

- Occipital nerve decompression is an effective treatment for some patients with chronic frequent headaches
- Consider this treatment for pts with frequent headaches who are refractory to medications or even nerve blocks
- The longer the headaches have been present, the less likely to respond to decompression