DIAGNOSIS AND INTERVENTIONAL TREATMENT OF CHRONIC FACIAL PAIN

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“HOW TO MAKE $70 PLACING NEEDLES INTO SMALL HOLES WHILE MAINTAINING EXCELLENT RECTAL TONE”
DISCLOSURES

• PRODUCT ROYALTY FROM EPIMED INTERNATIONAL

• FORMER ADVISORY BOARD MEMBER OF AIS
OBJECTIVES

- REVIEW THE WORK UP FOR FACIAL PAIN
- DIFFERENTIAL DIAGNOSIS FOR FACIAL PAIN
- REVIEW THE TRIGEMINAL NERVE BLOCK
- REVIEW THE SPHENOPALATINE GANGLION BLOCK
- REVIEW THE GLOSSOPHARYNGEAL NERVE BLOCK
PAIN IN FACE ≠ TRIGEMINAL NEURALGIA
FACIAL PAIN

• PAIN IN THE HEAD AND NECK IS MEDIATED BY AFFERENT FIBERS IN THE TRIGEMINAL NERVE, NERVUS INTERMEDIUS, GLOSSOPHARYNGEAL AND VAGUS NERVES AND THE UPPER CERVICAL ROOTS VIA THE OCCIPITAL NERVES

• STIMULATION OF THESE NERVES BY COMPRESSION, DISTORTION, EXPOSURE TO COLD OR OTHER FORMS OF IRRITATION OR BY A LESION IN CENTRAL PATHWAYS MAY GIVE RISE TO STABBING OR CONSTANT PAIN FELT IN THE AREA INNERVATED

• CAUSE MAY BE CLEAR, BUT IN SOME CASES THERE MAY BE NO CAUSE APPARENT FOR NEURALGIC PAIN
EVALUATION

• THOROUGH HISTORY
  • SOMETIMES THE PAIN THE PATIENT PRESENTS WITH IS NOT THE SAME PAIN THE PATIENT STARTED WITH

• PHYSICAL EXAM
  • EVALUATE THE FACE AS WELL AS THE NECK
    • PAIN ORIGINATING IN THE NECK CAN PRESENT ITSELF AS PAIN IN THE FACE
    • CRANIAL NERVES AS WELL AS C₂ AND C₃

• RADIOLOGICAL EVALUATION
  • USUALLY MRI
Figure 1: Type and causes of non-dental chronic orofacial pain.

Zakrzewska, The Journal of Headache and Pain 2013, 14:37
13. Painful lesions of the cranial nerves and other facial pain

13.1 Pain attributed to a lesion or disease of the trigeminal nerve

13.1.1 Trigeminal neuralgia
   13.1.1.1 Classical trigeminal neuralgia
      13.1.1.1.1 Classical trigeminal neuralgia, purely paroxysmal
      13.1.1.1.2 Classical trigeminal neuralgia with concomitant continuous pain
   13.1.1.2 Secondary trigeminal neuralgia
      13.1.1.2.1 Trigeminal neuralgia attributed to multiple sclerosis
      13.1.1.2.2 Trigeminal neuralgia attributed to space-occupying lesion
      13.1.1.2.3 Trigeminal neuralgia attributed to other cause
   13.1.1.3 Idiopathic trigeminal neuralgia
      13.1.1.3.1 Idiopathic trigeminal neuralgia, purely paroxysmal
      13.1.1.3.2 Idiopathic trigeminal neuralgia with concomitant continuous pain

13.1.2 Painful trigeminal neuropathy
   13.1.2.1 Painful trigeminal neuropathy attributed to herpes zoster
   13.1.2.2 Trigeminal post-herpetic neuralgia
   13.1.2.3 Painful post-traumatic trigeminal neuropathy
   13.1.2.4 Painful trigeminal neuropathy attributed to other disorder
   13.1.2.5 Idiopathic painful trigeminal neuropathy

13.2 Pain attributed to a lesion or disease of the glossopharyngeal nerve

13.2.1 Glossopharyngeal neuralgia
   13.2.1.1 Classical glossopharyngeal neuralgia
   13.2.1.2 Secondary glossopharyngeal neuralgia
   13.2.1.3 Idiopathic glossopharyngeal neuralgia

13.2.2 Painful glossopharyngeal neuropathy
   13.2.2.1 Painful glossopharyngeal neuropathy attributed to a known cause
   13.2.2.2 Idiopathic painful glossopharyngeal neuropathy
13.3 Pain attributed to a lesion or disease of nervus intermedius
   13.3.1 Nervus intermedius neuralgia
      13.3.1.1 Classical nervus intermedius neuralgia
      13.3.1.2 Secondary nervus intermedius neuralgia
      13.3.1.3 Idiopathic nervus intermedius neuralgia
   13.3.2 Painful nervus intermedius neuropathy
      13.3.2.1 Painful nervus intermedius neuropathy attributed to herpes zoster
      13.3.2.2 Post-herpetic neuralgia of nervus intermedius
      13.3.2.3 Painful nervus intermedius neuropathy attributed to other disorder
      13.3.2.4 Idiopathic painful nervus intermedius neuropathy

13.4 Occipital neuralgia
13.5 Neck-tongue syndrome
13.6 Painful optic neuritis
13.7 Headache attributed to ischaemic ocular motor nerve palsy
13.8 Tolosa-Hunt syndrome
13.9 Paratrigeminal oculosympathetic (Raeder’s) syndrome
13.10 Recurrent painful ophthalmoplegic neuropathy
13.11 Burning mouth syndrome (BMS)
13.12 Persistent idiopathic facial pain (PIFP)
13.13 Central neuropathic pain
   13.13.1 Central neuropathic pain attributed to multiple sclerosis (MS)
   13.13.2 Central post-stroke pain (CPSP)
CLASSICAL TRIGEMINAL NEURALGIA

- Paroxysmal attacks of pain lasting from a fraction of a second to 2 minutes, affecting one or more divisions of the trigeminal nerve and fulfilling criteria B and C.

- Pain has at least one of the following characteristics:
  - Intense, sharp, superficial or stabbing
  - Precipitated from trigger areas or by trigger factors

- Attacks are stereotyped in the individual patient

- There is no clinically evident neurological deficit

- Not attributed to another disorder
CLASSICAL TRIGEMINAL NEURALGIA

• INCIDENCE 4-5/100,000/YEAR
• HIGHEST INCIDENCE AGES 50-70
• FEMALE : MALE - 1.5 : 1
• DISTRIBUTION
  • V2 + V3 - 32%
  • V2 ONLY - 17%
  • V1 + V2 + V3 - 17%
  • V3 ONLY - 15%
  • V1 + V2 - 14%
  • V1 ONLY - 4%
ETIOLOGY OF CLASSICAL TRIGEMINAL NEURALGIA

• VASCULAR COMPRESSION OF THE TRIGEMINAL ROOT AT THE DORSAL ROOT ENTRY ZONE BY ARTERY OR VEIN
  • USUALLY THE SUPERIOR CEREBELLAR ARTERY

• TUMORS
  • FOUND IN 2% OF PATIENTS WITH TN
  • USUALLY POSTERIOR FOSSA MENINGIOMAS OR NEUROMAS AT THE CEREBELLOPONTINE ANGLE

• MULTIPLE SCLEROSIS
  • DIAGNOSED IN 2-5% OF PATIENTS WITH MS
  • 20-FOLD INCREASED RISK OF TRIGEMINAL NEURALGIA

• IDIOPATHIC
  • 11% OF PATIENTS WITH TN
PATHOPHYSIOLOGY OF TN

• SEVERAL LOCATIONS INVOLVED:
  • TRIGEMINAL GANGLION IS NOT NORMAL
    • DEGENERATIVE HYPERMYELINATION AND FORMATION OF MICRONEUROMITA
      • MECHANISM OF HOW THIS OCCURS IS UNKNOWN
  • TRIGEMINAL DORSAL ROOT ENTRY ZONE
    • COMPRESSION OR MS PLAQUES LEADS WITH TIME TO HYPEREXCITABILITY IN TRIGEMINAL AFFERENTS
  • TRIGEMINAL ROOT
    • SITE OF COMPRESSION SHOWS DEMYELINATION AND REMYELINATION IN THE PRIMARY AFFERENTS AT THE ENTRY
      OF THE ROOT INTO THE PONS
  • HYPERACTIVITY OF PRIMARY AFFERENTS SECONDARILY INDUCES CENTRAL SENSITIZATION OF WIDE
    DYNAMIC RANGE NEURONS IN THE SPINAL TRIGEMINAL NUCLEUS
CLASSICAL TRIGEMINAL NEURALGIA
SYMPTOMATIC TRIGEMINAL NEURALGIA

• Paroxysmal attacks of pain lasting from a fraction of a second to 2 minutes, with or without persistence of aching between paroxysms, affecting one or more divisions of the trigeminal nerve and fulfilling criteria B and C.

• Pain has at least one of the following characteristics:
  • Intense, sharp, superficial or stabbing
  • Precipitated from trigger areas or by trigger factors

• Attacks are stereotyped in the individual patient.

• A causative lesion, other than vascular compression, has been demonstrated by special investigations and/or posterior fossa exploration.
TRIGEMINAL NEUROPATHIC PAIN

- Onset 3-6 months after a traumatic event
- Pain constant with minor fluctuations although some may have intermittent episodes
- Pain in the distribution of the injured nerve
- PE: Alldynia and hypoesthesia
INTERVENTIONAL TREATMENT OPTIONS FOR TRIGEMINAL PAINS

- INTERVENTIONAL THERAPIES
  - TRIGEMINAL NERVE/GANGLION BLOCK/RFTC/PULSED RF
  - SURGICAL MICROVASCULAR DECOMPRESSION (MVD)
  - STERIOTACTIC RADIATION THERAPY, GAMMA KNIFE
  - BALLOON MICROCOMPRESSION
  - PERCUTANEOUS GLYCEROL RHIZOLYSIS
  - GASSERIAN GANGLION STIMULATION/PERIPHERAL NERVE STIMULATORS
TRIGEMINAL NERVE/GANGLION BLOCK

• INDICATED FOR TREATMENT OF:
  • TRIGEMINAL NEURALGIA
    • TYPICAL
    • ATYPICAL
  • MIGRAINE HEADACHES
  • CLUSTER HEADACHES
TRIGEMINAL NERVE ANATOMY

- The trigeminal nerve is the largest and most complex of the 12 cranial nerves.
- It supplies sensations to the face, mucous membranes, and other structures of the head.
- It is the motor nerve for the muscles of mastication and contains proprioceptive fibers.
- It exits the brain by a large sensory root and a smaller motor root coming out of the pons at its junction with the middle cerebral peduncle. It passes laterally to join the gasserian ganglion in the Meckel cave.
TRIGEMINAL NERVE ANATOMY

• THERE ARE 3 MAJOR BRANCHES:
  • OPHTHALMIC – SENSORY
    • BRANCHES: FRONTAL, LACRIMAL, AND NASOCILIARY NERVES
  • MAXILLARY – SENSORY
    • BRANCHES: MIDDLE MENINGEAL, ZYGOMATIC, PTERYGOPALATINE, POSTERIOR SUPERIOR ALVEOLAR
  • MANDIBULAR – SENSORY AND MOTOR
    • BRANCHES: RECURRENT MENINGEAL, MEDIAL PTERYGOID, MASSETERIC, DEEP TEMPORAL, LATERAL PTERYGOID, BUCCAL, AURICULOTEMPORAL, LINGUAL, INFERIOR ALVEOLAR
TRIGEMINAL GANGLION BLOCK

- COMPLICATIONS:
  - BLEEDING
    - INTRACRANIAL
    - EXTRACRANIAL
  - MENINGITIS
  - HIGH SPINAL
  - DECREASED CORNEAL REFLEX
  - HYPOESTHESIA
  - ANESTHESIA DOLOROSA
  - INJURY TO ADJACENT CRANIAL NERVES
Review Article
Various surgical modalities for trigeminal neuralgia: literature study of respective long-term outcomes

M. Tatlı1, O. Satıcı2, Y. Kanpolat3, M. Sindou4

1. Among the surgical techniques, MVD provides the highest rate of long-term patient satisfaction with the lowest rate of pain recurrence. In experienced hands, its side-effects are uncommon. Therefore, it might be considered as the first treatment choice for an experienced team when the patient’s condition is satisfactory.

2. RF-TR provides a high rate of initial pain relief; however, it has not only a high rate of long-term failure but also serious complications. Despite of its various complications, it might be less invasive with experience, using neurophysiological tests. RF-TR is suitable for patients who do not tolerate general anaesthesia and in patients who have recurrent pain.

3. Among the surgical procedures, PBC has the highest rate of postoperative trigeminal motor dysfunction.

4. GR has both low initial pain relief and high pain recurrence rate; therefore, it may be suitable only in the treatment of elderly patients who desire no sensory loss and carry a high risk for open surgery to be used if the other modalities are not available.

5. Although SRS is associated with the fewest complications compared to those of the other destructive procedures, it has a low initial success rate as well as FU pain free rate. In our opinion, it may be a reasonable treatment option for those unwilling or unable to undergo more invasive surgical approaches, and in recurrence or failed TN.

6. Due to the low success rate, high complications, and available more eligible surgical options, there is no longer an identification to perform PSR compared to MVD in the treatment of TN.
<table>
<thead>
<tr>
<th>Refs.</th>
<th>Surgical technique</th>
<th>No. of patients</th>
<th>Average FU (year)</th>
<th>APR Rate (%)</th>
<th>Pain free rate at FU (%)</th>
<th>Recurrence or failure rate (%)</th>
<th>Major complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menzel et al. [25]</td>
<td>RF-TR</td>
<td>315</td>
<td>12.7</td>
<td>*</td>
<td>20</td>
<td>80</td>
<td>keratitis, dysaesthesia</td>
</tr>
<tr>
<td>Van Laveren et al. [47]</td>
<td>RF-TR</td>
<td>700</td>
<td>6</td>
<td>81</td>
<td>61</td>
<td>20</td>
<td>troublesome dysaesthesia (5%)</td>
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<tr>
<td>Latshaw et al. [19]</td>
<td>RF-TR</td>
<td>96</td>
<td>5</td>
<td>*</td>
<td>53</td>
<td>35</td>
<td>keratitis (4%), A–V fistula (0.14%)</td>
</tr>
<tr>
<td>Kalluri and Heron [15]</td>
<td>MVD</td>
<td>72</td>
<td>5</td>
<td>*</td>
<td>78</td>
<td>22</td>
<td>sensory loss</td>
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<tr>
<td>Apfelbaum [2]</td>
<td>MVD</td>
<td>446</td>
<td>6.4</td>
<td>*</td>
<td>67</td>
<td>18</td>
<td>hearing loss</td>
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<tr>
<td>Bederson and Wilson [4]</td>
<td>MVD</td>
<td>246</td>
<td>5.1</td>
<td>*</td>
<td>83</td>
<td>17</td>
<td>hearing loss (3%)</td>
</tr>
<tr>
<td>Broggi et al. [6]</td>
<td>RF-TR</td>
<td>1000</td>
<td>9.3</td>
<td>95</td>
<td>82</td>
<td>18.1</td>
<td>dysaesthesia, anaesthesia dolorosa</td>
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<tr>
<td>Lithbor and Mullan [21]</td>
<td>PBC</td>
<td>61</td>
<td>5</td>
<td>97</td>
<td>80</td>
<td>20</td>
<td>dysaesthesia, paraesthesia</td>
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<tr>
<td>Stiegler [37]</td>
<td>CR</td>
<td>122</td>
<td>5</td>
<td>84</td>
<td>59</td>
<td>41</td>
<td>sensory deficit, diminished corneal ref. (15%)</td>
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<tr>
<td>Klin et al. [14]</td>
<td>MVD</td>
<td>178</td>
<td>5.2</td>
<td>94</td>
<td>84</td>
<td>6</td>
<td>hearing loss</td>
</tr>
<tr>
<td>Zakrzew ska and Thomas [50]</td>
<td>MVD</td>
<td>65</td>
<td>5</td>
<td>*</td>
<td>62</td>
<td>38</td>
<td>hearing loss, facial hypaesthesia</td>
</tr>
<tr>
<td>Sun et al. [38]</td>
<td>MVD</td>
<td>61</td>
<td>6.6</td>
<td>*</td>
<td>82</td>
<td>18</td>
<td>hearing loss</td>
</tr>
<tr>
<td>Walchenbach et al. [48]</td>
<td>MVD</td>
<td>58</td>
<td>6.4</td>
<td>80</td>
<td>71</td>
<td>29</td>
<td>persistent neurological deficit (1.7%)</td>
</tr>
<tr>
<td>Mendota and Ilbingworth [24]</td>
<td>MVD</td>
<td>60</td>
<td>7.3</td>
<td>*</td>
<td>71</td>
<td>18</td>
<td>death (0.7%), CSF leak</td>
</tr>
<tr>
<td>Barker et al. [3]</td>
<td>MVD</td>
<td>1155</td>
<td>6.2</td>
<td>98</td>
<td>70</td>
<td>30</td>
<td>hearing loss, facial hypaesthesia, death (0.2%)</td>
</tr>
<tr>
<td>Taha and Tew [41]</td>
<td>RF-TR</td>
<td>500</td>
<td>9</td>
<td>98</td>
<td>80</td>
<td>20</td>
<td>facial hypaesthesia (98%)</td>
</tr>
<tr>
<td>Otura et al. [28]</td>
<td>RF-TR</td>
<td>183</td>
<td>8</td>
<td>83</td>
<td>49</td>
<td>49</td>
<td>facial paraplegia (23%), dysaesthesia (4%)</td>
</tr>
<tr>
<td>Kondo [16]</td>
<td>GR</td>
<td>45</td>
<td>8</td>
<td>42</td>
<td>18</td>
<td>84</td>
<td>hearing loss</td>
</tr>
<tr>
<td>Lee et al. [20]</td>
<td>MVD</td>
<td>146</td>
<td>5.7</td>
<td>96.5</td>
<td>89</td>
<td>8.6</td>
<td>facial dysaesthesia, death (1.4%)</td>
</tr>
<tr>
<td>Yoon et al. [49]</td>
<td>RF-TR</td>
<td>81</td>
<td>6</td>
<td>87</td>
<td>26</td>
<td>74</td>
<td>dysaesthesia (23%), corneal hypersensitivity (15%)</td>
</tr>
<tr>
<td>Karapol et al. [12]</td>
<td>RF-TR</td>
<td>1600</td>
<td>5</td>
<td>97.6</td>
<td>57.7</td>
<td>42.3</td>
<td>diminished corneal reflex (5.7%), motor deficit (4.1%)</td>
</tr>
<tr>
<td>Skivring and Dan [35]</td>
<td>PBC</td>
<td>496</td>
<td>100</td>
<td>10</td>
<td>52.3</td>
<td>41</td>
<td>dysaesthesia (3.8%)</td>
</tr>
<tr>
<td>Trommer et al. [44]</td>
<td>MVD</td>
<td>223</td>
<td>10.9</td>
<td>*</td>
<td>65</td>
<td>75</td>
<td>death (0.8%), hypeaesthesia (5.3%)</td>
</tr>
<tr>
<td>Tyley-Kabara et al. [45]</td>
<td>RF-TR</td>
<td>206</td>
<td>14</td>
<td>14</td>
<td>25</td>
<td></td>
<td>death (0.2%), meningitis, CSF leak complication (2%)</td>
</tr>
<tr>
<td>Olson et al. [27]</td>
<td>MVD</td>
<td>156</td>
<td>10</td>
<td>93</td>
<td>74</td>
<td>18</td>
<td>hypersensitivity (20%)</td>
</tr>
<tr>
<td>Urgonek et al. [46]</td>
<td>SRS</td>
<td>107</td>
<td>5</td>
<td>80.4</td>
<td>58</td>
<td>25</td>
<td>hearing loss, facial hypaesthesia, eating problems</td>
</tr>
<tr>
<td>Zakrzew ska et al. [51]</td>
<td>MVD</td>
<td>220</td>
<td>5</td>
<td>89</td>
<td>84</td>
<td>4</td>
<td>gait disturbances, diplopia (0.83%), hearing loss (1.9%), death (0.44%)</td>
</tr>
<tr>
<td>Sindou et al. [34]</td>
<td>MVD</td>
<td>362</td>
<td>8</td>
<td>86</td>
<td>54</td>
<td>30</td>
<td>-</td>
</tr>
</tbody>
</table>

* Not clear.


PERIPHERAL NERVE STIMULATION

- **TRIGEMINAL NERVE**  
  - CENTRALLY, i.e. GANGLION  
  - PERIPHERALLY  

- **SUBRAORBITAL / SUPRATROCHLEAR NERVES**  
  - FOR NEURALGIAS AND MIGRAINES (USUALLY WITH ONS)  

- **INFRAORBITAL NERVE**  
  - NEURALGIAS  

- **AURICULOTEMPORAL NERVE**  
  - INTRACTABLE HEADACHES
<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Patients (N)</th>
<th>Causes</th>
<th>Area of PFNS Implantation</th>
<th>Results</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dunteman, 2002</td>
<td>2</td>
<td>Postherpetic (2)</td>
<td>Supraorbital (2)</td>
<td>Effectively treated</td>
<td>2 y</td>
</tr>
<tr>
<td>Johnson &amp; Burchiel, 2004</td>
<td>10</td>
<td>Posttraumatic (4) Posttraumatic (5)</td>
<td>Supraorbital (8) Infraorbital (2)</td>
<td>50% pain relief in 70% of patients Medication use declined in 70% of patients Two failures (50%) in postherpetic group</td>
<td>26.6 ± 4.7 mo</td>
</tr>
<tr>
<td>Slavin et al, 2006</td>
<td>30</td>
<td>Craniofacial pain Atypical face pain (1)</td>
<td>Occipital (21) Supraorbital (7) Infraorbital (6)</td>
<td>73% of patients had &gt;50% pain relief</td>
<td>35 mo</td>
</tr>
<tr>
<td>Asensio-Samper et al, 2008</td>
<td>1</td>
<td>Posttraumatic</td>
<td>Supraorbital</td>
<td>VAS 9–10 out of 10 to 2 out of 10 following PFNS</td>
<td>4 y</td>
</tr>
<tr>
<td>Reverberi et al, 2009</td>
<td>1</td>
<td>Trigeminal neuropathic pain</td>
<td>Supraorbital and infraorbital</td>
<td>&gt;50% reduction in pain intensity</td>
<td>5 mo</td>
</tr>
<tr>
<td>Suryya Prasad Upadhyay et al, 2010</td>
<td>1</td>
<td>Postherpetic</td>
<td>Supraorbital</td>
<td>&gt;50% reduction in pain intensity with improvement in quality of life</td>
<td>8 wk</td>
</tr>
<tr>
<td>Yakovlev &amp; Resch, 2010</td>
<td>1</td>
<td>Atypical face pain</td>
<td>Mandibular nerve</td>
<td>&gt;50% reduction in pain intensity</td>
<td>12 mo</td>
</tr>
<tr>
<td>Lenchig et al, 2012</td>
<td>1</td>
<td>Posttraumatic</td>
<td>Supraorbital and infraorbital</td>
<td>&gt;50% reduction in pain intensity with improvement in quality of life</td>
<td>3 mo</td>
</tr>
<tr>
<td>Stidd et al, 2012</td>
<td>3</td>
<td>Posttraumatic (2) Postherpetic (1)</td>
<td>Supraorbital (1) Infraorbital (2)</td>
<td>&gt;50% reduction in pain intensity</td>
<td>6–27 mo</td>
</tr>
<tr>
<td>Feletti et al, 2013</td>
<td>6</td>
<td>Posttraumatic (2) Postsurgical (1) Postherpetic (1) PIPF (2)</td>
<td>Supraorbital (1) Infraorbital (2) Occipital nerve (1) Supraorbital nerve + infraorbital nerve + occipital nerve (1) Occipital nerve + infraorbital nerve + mandibular nerve (1)</td>
<td>VAS from 10 out of 10 to 2.7 out of 10</td>
<td>17 mo</td>
</tr>
<tr>
<td>Our experience (unpublished data)</td>
<td>80</td>
<td>Craniofacial pain</td>
<td>Supraorbital + infraorbital + mandibular + occipital nerve</td>
<td>80% of patients had &gt;50% improvement</td>
<td>60 mo</td>
</tr>
</tbody>
</table>
Don’t get carried away!
PERSISTENT IDIOPATHIC FACIAL PAIN

• PREVIOUSLY USED TERM:
  • ATYPICAL FACIAL PAIN.

• DESCRIPTION:
  • PERSISTENT FACIAL AND/OR ORAL PAIN, WITH VARYING PRESENTATIONS BUT RECURRING DAILY FOR MORE THAN 2 HOURS/DAY OVER MORE THAN 3 MONTHS, IN THE ABSENCE OF CLINICAL NEUROLOGICAL DEFICIT.

• DIAGNOSTIC CRITERIA:
  • FACIAL AND/OR ORAL PAIN FULFILLING CRITERIA B AND C
  • RECURRING DAILY FOR >2 HOURS/DAY FOR >3 MONTHS
  • PAIN HAS BOTH OF THE FOLLOWING CHARACTERISTICS:
    • POORLY LOCALIZED, AND NOT FOLLOWING THE DISTRIBUTION OF A PERIPHERAL NERVE
    • DULL, ACHING OR NAGGING QUALITY
  • CLINICAL NEUROLOGICAL EXAMINATION IS NORMAL
  • A DENTAL CAUSE HAS BEEN EXCLUDED BY APPROPRIATE INVESTIGATIONS
  • NOT BETTER ACCOUNTED FOR BY ANOTHER ICHD-3 DIAGNOSIS.
SPHENOPALATINE GANGLION

• SPG IS ONE OF FOUR AUTONOMIC GANGLIA INSIDE THE HEAD

• LOCATED IN THE PTERYGOPALATINE FOSSA WHICH IS LOCATED POSTERIOR TO THE MIDDLE TURBINATE AND IS 2 TO 7 MM DEEP TO THE LATERAL NASAL MUCOSA
  • ANTERIOR BORDER: MAXILLARY SINUS
  • POSTERIOR BORDER: MEDIAL PTERYGOID PLATE
  • SUPERIOR BORDER: SPHENOID SINUS
  • MEDIAL: PALATINE BONE
SPHENOPALATINE GANGLION

• AUTONOMIC COMPONENTS
  • DEEP PETROSAL NERVE: POSTGANGLIONIC SYMPATHETICS FROM THE SUPERIOR CERVICAL GANGLION AND UPPER THORACIC SPINAL CORD
  • GREATER PETROSAL NERVE: PREGANGLIONIC PARASYMPATHETICS FROM THE SUPERIOR SALIVATORY NUCLEUS SYNAPSE IN THE SPG WITH POSTGANGLIONIC AXONS, VASODILATOR, AND SECRETORY FIBERS

• SENSORY FIBERS FROM TWO SPHENOPALATINE BRANCHES OF THE MAXILLARY NERVE PASS THROUGH THE SPG AND FORM THE PALATINE NERVES WHICH INNERVATE THE UPPER TEETH, NASAL MEMBRANES, SOFT PALATE AND SOME PARTS OF THE PHARYNX.

• ALSO HAS SECRETOMOTOR NERVES TO THE NASAL GLANDS FROM THE GREATER PETROSAL NERVE.
SPHENOPALATINE GANGLION BLOCK

• INDICATED FOR TREATMENT OF:
  • PERSISTENT IDIOPATHIC FACIAL PAIN
    • AKA “ATYPICAL FACIAL PAIN”
  • TRIGEMINAL NEURALGIA
  • SPHENOPALATINE NEURALGIA
  • MIGRAINE HEADACHES
  • CLUSTER HEADACHES
  • POST-TRAUMATIC HEADACHES
  • CANCER PAIN OF FACIAL AND OROFACIAL STRUCTURES
TREATMENT ALGORITHM

Facial pain
Daily – during the whole day or the greater part thereof

No sensory loss or other physical signs

If necessary, MRI

Pharmacological treatment insufficient effect

Consider PRF of the ganglion pterygopalatinum

Figure 1. Clinical practice algorithm for the treatment of atypical facial pain. MRI, magnetic resonance imaging; PRF, pulsed radiofrequency.

Pain Practice, Volume 9, Issue 6, 2009 443-448
SPHENOPALATINE GANGLION BLOCK

• TECHNIQUES:
  • INTRANASAL
    • COTTON SWABS SOAKED IN LOCAL ANESTHETIC
      • 4% COCAINE
      • 2% LIDOCAINE
      • VISCIOUS LIDOCAINE
  • INTRAORAL VIA THE PALATINE FORAMEN
    • LOCATED MEDIAL TO THE 2ND MOLAR
    • FORAMEN ENTERED WITH A CURVED NEEDLE
  • INFRAZYGOMATIC THROUGH THE MANDIBULAR NOTCH
    • RFTC
    • PULSED RF
TECHNIQUE

• FOR RFA, APPLY SENSORY STIMULATION AT 50 HZ TO LOCALIZE THE GANGLION
  • PLACEMENT OF THE NEEDLE AT THE GANGLION WILL GENERATE A PARESTHESIA AT THE ROOT OF THE NOSE
    • THE LOWER THE STIMULATION THE BETTER.
  • BEST TO USE A 2-3 MM ACTIVE TIP TO DECREASE THE POSSIBILITY OF LESIONING THE MAXILLARY NERVE OR PALATINE NERVES
  • LESION AT 67-80 DEGREES CELSIUS
  • PULSE RF CAN BE DONE AT 45 VOLTS
Base of "inverted vase"

Pterygomaxillary fissure
SPHENOPALATINE GANGLION BLOCK

• COMPLICATIONS
  • HEMATOMA
    • LARGE VENOUS PLEXUS
    • MAXILLARY ARTERY
  • EPISTAXIS
  • NERVE INJURY
  • EYE INJURY
    • RETROBULBAR HEMATOMA VIA THE INFRAORBITAL FISSURE
  • INTRAVASCULAR INJECTION
  • MAXILLARY SINUS FRACTURE
Table 2. Summary of Sphenopalatine Block/Neurolysis Articles

<table>
<thead>
<tr>
<th>Authors</th>
<th>Study Type</th>
<th>Diagnosis</th>
<th>No. of Patients</th>
<th>Grade of Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gregoire et al.</td>
<td>CR</td>
<td>Trigeminal neuralgia</td>
<td>1</td>
<td>1C</td>
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<tr>
<td>Shah, Racz</td>
<td>CR</td>
<td>Posttraumatic HA</td>
<td>1</td>
<td>1C</td>
</tr>
<tr>
<td>Yang, Oraee</td>
<td>CR</td>
<td>Cluster HA</td>
<td>1</td>
<td>1C</td>
</tr>
<tr>
<td>Saade, Palge</td>
<td>CR</td>
<td>CA</td>
<td>1</td>
<td>1C</td>
</tr>
<tr>
<td>Manahan et al.</td>
<td>CR</td>
<td>Trigeminal neuralgia</td>
<td>1</td>
<td>1C</td>
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<tr>
<td>Peterson et al.</td>
<td>CR</td>
<td>Trigeminal neuralgia, Tooth pain</td>
<td>2</td>
<td>1C</td>
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<tr>
<td>Quevedo et al.</td>
<td>CR</td>
<td>CRPS lower extremity</td>
<td>2</td>
<td>2C</td>
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<tr>
<td>Salar et al.</td>
<td>CS</td>
<td>Sphenopalatine neuralgia</td>
<td>7</td>
<td>1C</td>
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<tr>
<td>Sanders et al.</td>
<td>CS</td>
<td>Cluster HA</td>
<td>66</td>
<td>1C</td>
</tr>
<tr>
<td>Puig et al.</td>
<td>CS</td>
<td>Sphenopalatine neuralgia</td>
<td>8</td>
<td>1C</td>
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<tr>
<td>Bayer et al.</td>
<td>RR</td>
<td>Atypical facial pain, sphenopalatine neuralgia, atypical trigeminal neuralgia, migraine HA</td>
<td>30</td>
<td>1C</td>
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<tr>
<td>Berger et al.</td>
<td>DB,PC</td>
<td>Low back pain</td>
<td>21</td>
<td>2B</td>
</tr>
<tr>
<td>Janzen et al.</td>
<td>DB,PC</td>
<td>Myofascial pain, fibromyalgia</td>
<td>21</td>
<td>2B</td>
</tr>
<tr>
<td>Ferrante et al.</td>
<td>DB,PC</td>
<td>Myofascial pain head, neck, shoulders</td>
<td>23</td>
<td>2B</td>
</tr>
</tbody>
</table>

CR, case report; CS, case series; RR, retrospective review; DB,PC, double-blinded, placebo-controlled; CRPS, complex regional pain syndrome; HA, headache; CA, cancer.
EVIDENCE-BASED MEDICINE
Evidence-Based Interventional Pain Medicine according to Clinical Diagnoses

3. Persistent Idiopathic Facial Pain

Paul Cornelissen, MD; Maarten van Kleef, MD, PhD, FIPP; Nagy Mekhail, MD, PhD, FIPP; Miles Day, MD, FIPP, DABIPP; Jan van Zundert, MD, PhD, FIPP

Table 3. Summary of Evidence for Interventional Pain Management

<table>
<thead>
<tr>
<th>Technique</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulsed radiofrequency treatment of the ganglion pterygopalatinum (sphenopalatinum)</td>
<td>2 C+</td>
</tr>
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</table>

2 C+ Effectiveness only demonstrated in observational studies. Given that there is no conclusive evidence of the effect, benefits closely balanced with risk and burdens
GLOSSOPHARYNGEAL NEURALGIA

• DESCRIPTION:
  • A DISORDER CHARACTERIZED BY UNILATERAL BRIEF STABBING PAIN, ABRUPT IN ONSET AND TERMINATION, IN THE DISTRIBUTIONS NOT ONLY OF THE GLOSSOPHARYNGEAL NERVE BUT ALSO OF THE AURICULAR AND PHARYNGEAL BRANCHES OF THE VAGUS NERVE. PAIN IS EXPERIENCED IN THE EAR, BASE OF THE TONGUE, TONSILLAR FOSSA AND/OR BENEATH THE ANGLE OF THE JAW. IT IS COMMONLY PROVOKED BY SWALLOWING, TALKING OR COUGHING AND MAY REMIT AND RELAPSE IN THE FASHION OF TRIGEMINAL NEURALGIA.

• DIAGNOSTIC CRITERIA:
  • RECURRING PAROXYSMAL ATTACKS OF UNILATERAL PAIN IN THE DISTRIBUTION OF THE GLOSSOPHARYNGEAL NERVE\(^1\) AND FULFILLING CRITERION B
  • PAIN HAS ALL OF THE FOLLOWING CHARACTERISTICS:
    • LASTING FROM A FEW SECONDS TO 2 MINUTES
    • SEVERE INTENSITY
    • ELECTRIC SHOCK-LIKE, SHOOTING, STABBING OR SHARP IN QUALITY
    • PRECIPITATED BY SWALLOWING, COUGHING, TALKING OR YAWNING
  • NOT BETTER ACCOUNTED FOR BY ANOTHER ICHD-3 DIAGNOSIS.
GLOSSOPHARYNGEAL NEURALGIA

• CLASSICAL GLOSSOPHARYNGEAL NEURALGIA
  • DESCRIPTION:
    • GLOSSOPHARYNGEAL NEURALGIA DEVELOPING WITHOUT APPARENT CAUSE OTHER THAN NEUROVASCULAR COMPRESSION.

• SECONDARY GLOSSOPHARYNGEAL NEURALGIA
  • DESCRIPTION:
    • GLOSSOPHARYNGEAL NEURALGIA CAUSED BY AN UNDERLYING DISEASE.

• IDIOPATHIC GLOSSOPHARYNGEAL NEURALGIA
  • DESCRIPTION:
    • GLOSSOPHARYNGEAL NEURALGIA WITH NO EVIDENCE EITHER OF NEUROVASCULAR COMPRESSION OR OF CAUSATIVE UNDERLYING DISEASE.
GLOSSOPHARYNGEAL NERVE

- GLOSSOPHARYNGEAL NERVE
  - RECEIVES SENSORY INFORMATION FROM THE POSTERIOR THIRD OF THE TONGUE, SOFT PALATE, TONSILS, PHARYNX, AND THE AUDITORY CANAL.
  - INNERVATES THE STYLOPHARYNGEUS MUSCLE
GLOSSOPHARYNGEAL NERVE

- GLOSSOPHARYNGEAL NERVE
  - ARISES FROM THE MEDULLA AND RUNS ANTERIORLY UNDER THE PETROUS PORTION OF THE TEMPORAL BONE.
  - EXITS THE SKULL VIA THE JUGULAR FORAMEN AND RUNS BETWEEN THE INTERNAL CAROTID ARTERY AND THE INTERNAL JUGULAR VEIN POSTERIOR TO THE STYLOID PROCESS.
GLOSSOPHARYNGEAL NERVE BLOCK

• INDICATIONS
  • GLOSSOPHARYNGEAL NEURALGIA
  • PERSISTENT IDIOPATHIC FACIAL PAIN
  • PAIN SECONDARY PHARYNGEAL CANCER

• DIAGNOSTIC BLOCK WITH LOCAL ANESTHETIC

• DEFINITIVE TREATMENT WITH RF/PULSED RF OR CRYONEUROLYSIS
GLOSSOPHARYNGEAL NERVE BLOCK

• COMPLICATIONS
  • INTRAVASCULAR INJECTION
  • UNINTENTIONAL BLOCKADE OF OTHER CRANIAL NERVES
  • DIFFICULTIES SWALLOWING AND HOARSENESS SECONDARY TO CN IX AND CN X BLOCKADE, RESPECTIVELY.
  • TACHYCARDIA AND HYPERTENSION SECONDARY TO BLOCKADE OF PARASYMPATHETIC OUTFLOW
<table>
<thead>
<tr>
<th>Table 1: The main characteristics of the most common chronic non-dental pains and their management</th>
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<td><strong>Post traumatic trigeminal neuropathy</strong></td>
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<tr>
<td><strong>Epidemiology</strong></td>
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<td><strong>Onset</strong></td>
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<td><strong>Severity</strong></td>
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<td><strong>Aggravating factors</strong></td>
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<td><strong>Associated factors</strong></td>
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<tr>
<td><strong>Examination</strong></td>
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<tr>
<td><strong>Management</strong></td>
</tr>
</tbody>
</table>

CBT cognitive behaviour therapy.

Zakrzewska J. The Journal of Headache and Pain 2013; 14:37
QUESTIONS