



## PALLIATIVE CARE CASE OF THE MONTH

### “Trigeminal Neuralgia in Head and Neck Cancer”

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**Case:** A 78-year-old woman is admitted to the hospital with a femoral neck fracture that required surgical intervention. Palliative Care is consulted to help manage post-operative pain as well as mouth and facial pain in the area of her known metastatic squamous cell carcinoma of the right oral cavity (not a surgical candidate). Though her hip pain is controlled, she describes paroxysms of excruciating, burning, electricity-like jolts of pain involving her right oral cavity, mandibular teeth, and the skin overlying her jaw. Additionally, when these short bursts of pain resolve, she is left with continuous aching and throbbing pain in the same area. Brushing her teeth, eating, talking, and clinical exams worsen the intensity and duration of the paroxysmal pain. The oxycodone she takes for her post-surgical hip pain only marginally improves her mouth and facial pain. Earlier in her admission, she was started on gabapentin for the mouth and facial pain, but she was unable to tolerate doses higher than 300 mg total per day due to somnolence. Her pain is so severe that she is barely tolerating any oral nutrition and hydration, her sleep quality is impaired, and she is desperate for relief. Examination reveals mild right facial swelling and white mucosal plaque at the site of known squamous cell carcinoma, all unchanged from baseline.

#### **Anatomy Alert!**

The trigeminal nerve (cranial nerve V) provides both motor and sensory input to the face and oral cavity. It has three branches on each side (ophthalmic—V1; maxillary—V2; and mandibular—V3). The ophthalmic branch provides sensory innervation to the scalp and the face above the palpebral fissure in addition to the nasal cavity. The maxillary branch provides sensory innervation to the face between the palpebral fissure and the mouth, the nasal cavity, the palate, and maxillary teeth. The mandibular branch provides sensory innervation to the rest of the face, mandibular teeth, oral mucosa, and the anterior two thirds of the tongue (note—not taste, which is provided by the facial nerve, cranial nerve VII). This branch also provides motor innervation to the muscles of mastication.<sup>1</sup> When a head and neck cancer spreads and invades the perineural area of the trigeminal nerve, patients can develop trigeminal neuralgia.<sup>2</sup>

The symptoms of trigeminal neuralgia arise when the trigeminal nerve is compressed or injured (e.g., due to trauma, tumor, swelling, vascular anomaly, demyelinating disease), though it can also be idiopathic.<sup>3,4</sup> Typical symptoms include paroxysmal stabbing/electricity-like pain (lasting seconds to a few minutes) with or without continuous background aching or throbbing pain in the affected nerve distribution.

The mandibular and maxillary distributions are the most affected sites despite the pathophysiology often occurring at the trigeminal nerve root.<sup>4</sup> In one study of 140 patients, 136 (97%) reported at least one trigger of a paroxysm of pain. In this study, triggers included touching the face (79%), talking (54%), chewing (44%), and brushing teeth (31%).<sup>5</sup>

The diagnosis is clinical, though in cases with abnormalities on the neurologic exam and without prior known etiology, MRI of the brain (with thin cuts through the posterior fossa) and MRA of the head and neck are the best tests to determine the etiology while also aiding in the preparation for operative intervention if applicable.

While our patient’s most prominent symptoms suggest neuropathic pain in the form of trigeminal neuralgia, mixed nociceptive and neuropathic pain is common in head and neck cancer<sup>6</sup>. Using screening tools such as the Leeds Assessment of Neuropathic Symptoms and Signs questionnaire to characterize pain, neuropathic pain is found in 50% - 90% of patients with head and neck cancer reporting pain<sup>7</sup>. A recent randomized controlled trial showed that patients with head and neck cancer with radiotherapy-induced pain, which is typically neuropathic, had improved pain, mood, and quality of life when treated with pregabalin<sup>8</sup>.

#### **Management of trigeminal neuralgia**

##### **Non-pharmacologic management:**<sup>5</sup>

Limit clinical exams as much as possible and consider batching conversations and provider visits, so that triggers like touching the face and talking are kept to a minimum.

##### **Pharmacologic management:**<sup>3,4</sup>

Note that the primary pharmacologic management of trigeminal neuralgia involves various antiepileptic medications.

- **1st line:** carbamazepine or oxcarbazepine; both structurally similar, both generic, both similarly effective at relieving symptoms of trigeminal neuralgia; carbamazepine has numerous drug-drug interactions due to it being a potent CYP3A4 inducer, something oxcarbazepine does not share
  - o **Efficacy:** NNT of 1.5 – 2.1 to achieve at least 50% reduction in pain severity and a 50% reduction in number of pain paroxysms
  - o **Dosing (all in divided doses):** Carbamazepine 200 mg/day, increase by 200 mg/day every three days until symptoms are controlled; Oxcarbazepine 300 mg/day, increase by 300 mg/day every three days until symptoms are controlled
- **2nd line:** lamotrigine, gabapentin, pregabalin, phenytoin, baclofen, topical agents (like lidocaine rinse)

*Personal details in the case published have been altered to protect patient privacy.*

For palliative care consultations please contact the Supportive and Palliative Care programs at PUH/MUH, 412-647-7243, pager # 8511, Shadyside, 412-647-7243, pager # 8513, Perioperative/ Trauma Pain, 412-647-7243, pager # 7246, UPCI Cancer Pain Service, pager 412-644-1724, Magee Women’s Hospital, pager 412-647-7243 pager # 8510, VA Palliative Care Program, 412-688-6178, pager # 296. Hillman Outpatient: 412-692-4724. For ethics consultations at UPMC Presbyterian-Montefiore and Children’s pager 412-456-1518

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### Interventional management:<sup>3,4</sup>

- **Surgery:** in cases of resectable benign tumors or compressive vascular anomalies, surgery is highly effective (between two thirds and 90% of patients are pain-free over periods from 3-11 years of follow up). In cases of severe symptoms refractory to all other management options, destructive therapy can be an option, though this leads to permanent sensory loss of the affected distribution
- **Injections:** botulinum toxin type A injections (3rd line), unclear efficacy
- **Radiation:** this is a noninvasive method of destructive therapy for refractory trigeminal neuralgia that, like surgery, also leads to permanent sensory loss of the affected distribution

### Case Conclusion:

While her entire inpatient care team implements the above non-pharmacologic interventions to minimize triggers, the Palliative Care service recommends initiating oxcarbazepine. The patient notes some improvement in her symptoms within 24 hours of initiating oxcarbazepine (300 mg total/day); she has near resolution of her symptoms after increasing oxcarbazepine to 600 mg total/day. Thereafter, her sleep improves, she consumes 100% of her meals, and she enjoys conversations with her loved ones for longer periods of time than in the recent past. Her outpatient Otolaryngologist who follows her for the metastatic oral squamous cell carcinoma remains involved in her care and management in the hospital as well as at discharge.

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