



28th Annual Gabor Racz Advanced Interventional
Pain Conference and Workshop
Budapest, Hungary **August 25-27, 2025**

The Role of Neurostimulation in Neuropathic Cancer Pain

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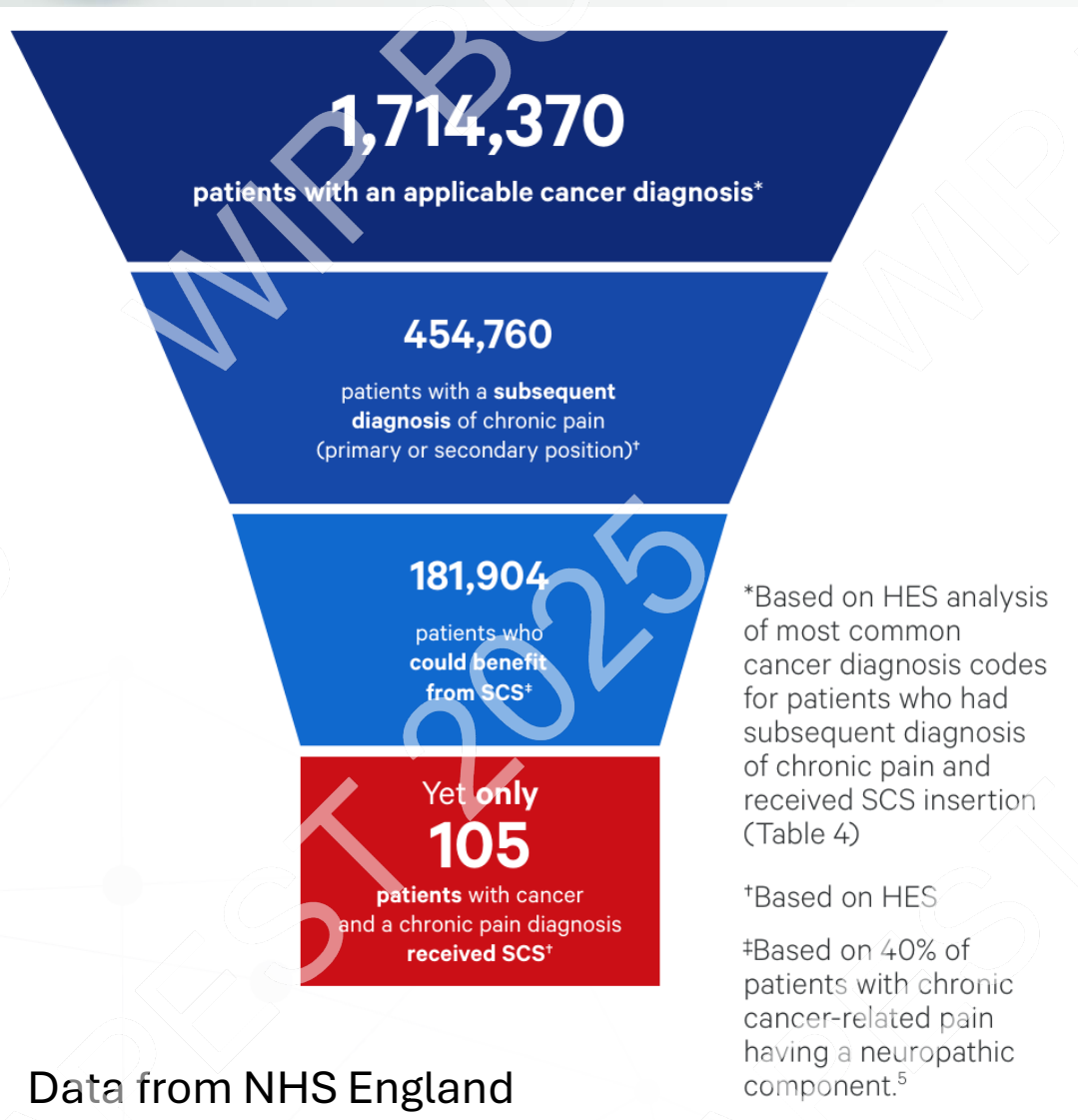
Conflicts of Interest

- Speaker and consulting fees from Boston Scientific and Abbott



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*Based on HES analysis of most common cancer diagnosis codes for patients who had subsequent diagnosis of chronic pain and received SCS insertion (Table 4)

†Based on HES

#Based on 40% of patients with chronic cancer-related pain having a neuropathic component.⁵

Cancer Pain Numbers

The image shows the cover of a report titled 'Spinal cord stimulation for cancer-related neuropathic pain in the NHS'. The cover has a dark purple background with a red geometric pattern. The title is in white text. Below the title, it says 'Funded by Boston Scientific'. At the bottom, there is a white bar with the word 'Published' and the date 'March 2023'. The logo for 'Wilmington Healthcare' is in the bottom right corner.

Spinal cord stimulation for cancer-related neuropathic pain in the NHS

Funded by Boston Scientific

Published March 2023

Wilmington Healthcare



Evolution of Cancer treatment



Cancer survival rates
are increasing



But cancer survivors
often have chronic pain



And 40%⁵ of cancer-related
pain has a neuropathic
component



Neuropathic Pain in Cancer Patients

Cancer-related neuropathic pain

- Radiculopathies
 - Lumbosacral
 - Cervical
 - Thoracic
- Plexopathies
 - Cervical
 - Brachial
 - Lumbosacral
 - Coccygeal plexopathy
- Peripheral neuropathies
 - Cranial neuralgia
 - Glossopharyngeal
 - Trigeminal
- Leptomeningeal seeding
- Tumour-related bone pain*
- Spinal cord compressions

Cancer treatment-related neuropathic pain

- Chemotherapy-induced peripheral neuropathies (CIPN)
- Chronic post-surgical pain syndromes:
 - Post-mastectomy
 - Post-neck dissection
 - Post-thoracotomy
- Post-radiation pain syndrome
 - Radiation-induced brachial plexopathies
 - Radiation myelopathy
 - Lymphoedema pain



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Spinal cord stimulation for pain caused by cancer and cancer treatment

Simon Thomson and Dmitry Kruglov

- Group 1: cancer survivors cured of disease (5+ years after treatment)
- Group 2: patients, who received curative therapy, but remain under surveillance (usually <5 years after treatment is completed) (good life expectancy)
- For group 1, there is no concern about the use of SCS
- This is less true for group 2





- Group 3: patients, currently receiving radical/ curative treatment
 - SCS might help them to continue therapy (i.e. chemotherapy) and, therefore, improve prognosis, when pain as a complication of treatment (e.g. painful neuropathy) might be a reason for discontinuation of curative treatment
- Group 4: cancer patients with a short- to- medium prognosis
 - Patients with active malignant disease, greater than 1- year life expectancy, where pain is the major problem, to improve quality of life
 - Patients with stable/ well- controlled long- term neoplastic conditions
- Group 5: advanced cancer with poor prognosis
- For groups 3 and 4, SCS is used rarely, mostly under clinical trial conditions or outside a public- funded healthcare system
- In group 5 SCS would not now be considered



Issues that Limits SCS Use in Cancer Patients

- Belief that opioids can treat adequately all cancer pain
- Need for regular MRI/ CT surveillance; currently, most SCSs allow some conditional use of MRI scanning but the presence of SCS leads and the implantable pulse generator (IPG) may distort imaging and impact oncological surveillance
- Immunosuppression and delayed wound healing related to cancer treatment increase the risk of infections

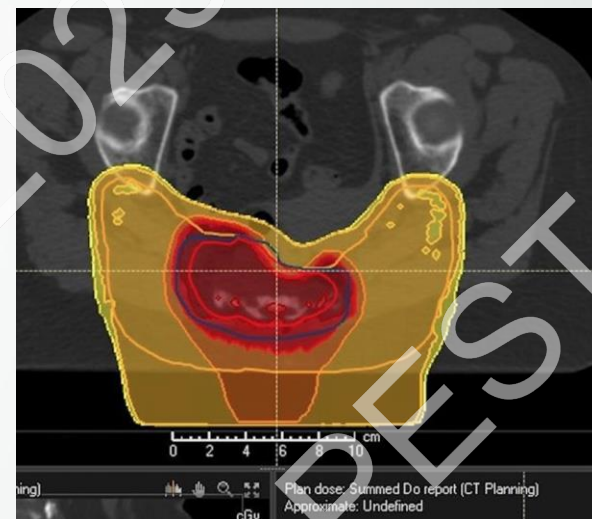
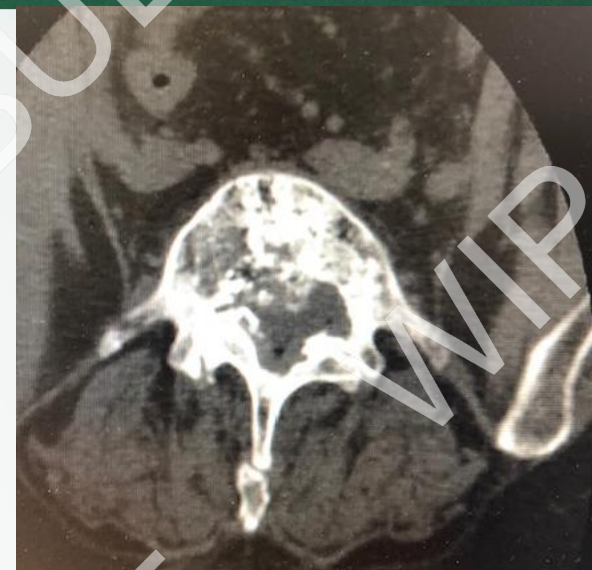


Needs for a Change in Cancer Pain Treatment

- Studies have reported that the severity of cancer-related pain is associated with shorter survival, independent of known prognostic factors (Zylla et al. Br J Anaesth. 2014; Halabi S et al. J Clin Oncol. 2014)
- Studies also suggest that there may be an association with long-term opioid use and shorter survival in cancer patients, warranting consideration of non-opioid-based therapy and interventional management (Boland JW et al. Pain. 2015)

Case 1. DMG, m 56y

- 17.8.2021: right inguinal and scrotal pain; CT, MRI and byoptic diagnosis of chordoma L4, L5, S1, T9; right inguinal lymphadenomegaly
- No surgical indication
- 24.11.2021-21-12.21: hadrontherapy, an advanced form of radiotherapy with protons and carbon ions, on L4, L5, S1
- 5.2022: low back pain and feet paresthesia
- 7.2022: MRI demonstrated minimal decrease of lumbosacral mass, persistence of T8, T9 lesions
- 9.2022: proton therapy on dorsal lesions





Pain History

- Since 4.23: low back and leg pain discreetly controlled with low doses opioids, feet paresthesia
- 4.23: increase in pain intensity: no effect of facet joint, SJ and epidural injections in a Palliative Care Unit
- 8.23: Referral to our Pain Unit for a IT pump implant



Pain Evaluation

- Patient referred pain (NRS 10) in lumbosacral and gluteal regions and posterior aspect of lower limbs, paresthesias in the same area
- Pain is continuous but increases when sitting (he uses a pillow) and getting up; electric like pain controlled by pregabalin
- Therapy: pregabalin 300 mg x 3, oxycodone 20 mg + acetaminophene 500 mg 2-3/day, morphine sc 10 mg x 2 with short lasting effect
- MRI: Conspicuous edema of the sacral alae with intraspongious fractures. Edema of the piriformis muscles. Stable vertebral lesions



Objective Assessment

- Skin alteration in sacral area due to radiotherapy
- Pressure on SJs doesn't evoke pain but paresthesias in lower limbs
- Pain evoked by pressure on iliac insertion of lower gluteal muscles (piriformis)
- Lower limbs distal motor impairment
- Tactile and thermal hypo-anesthesia in the territory L4-S2 on the left side, L4-L5 on the right
- Injection of lidocaine and steroid in periformis muscles reduced pain to 2

Treatment Proposal

- Change in pharmacologic treatment:
pregabalin 300 mg x 3, MS Contin 30 mg x
3, morphine 10 mg sc OD
- PRP injections in the piriformis muscles
to treat post-actinic edema
- After 3 months pain intensity was 5 NRS



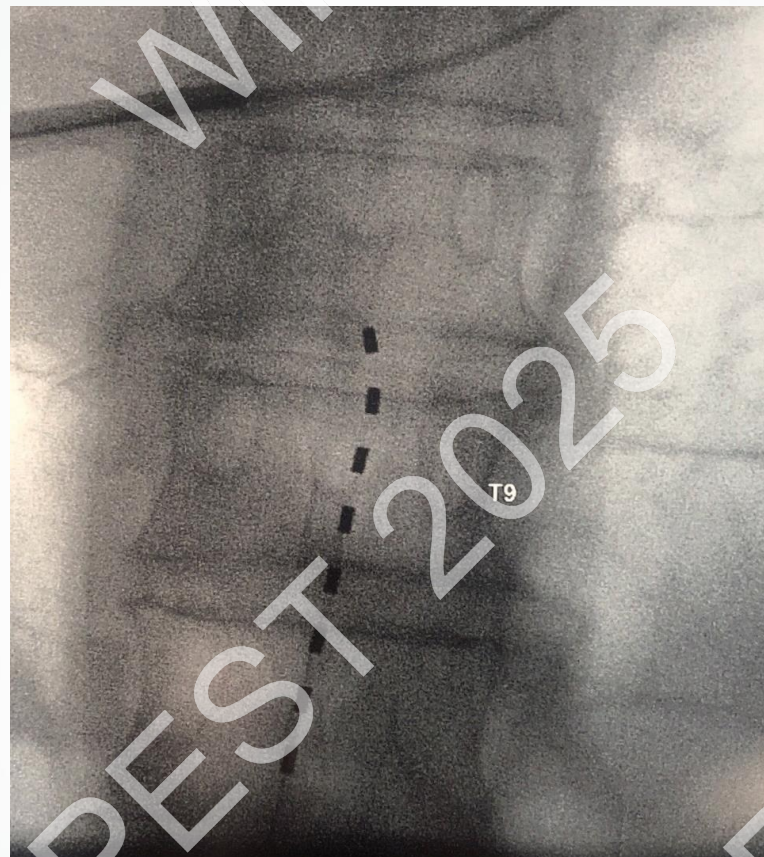
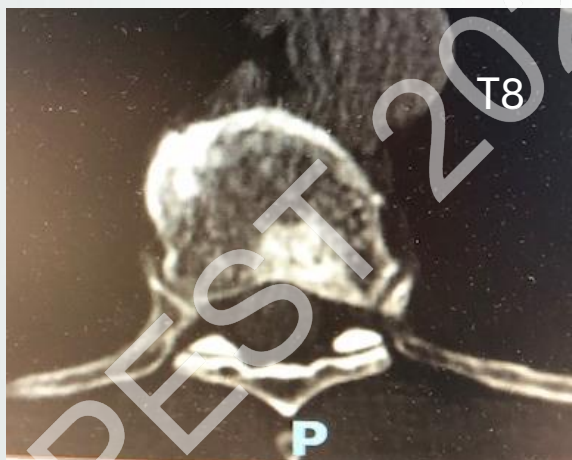
Follow up

- 4.24: defibrillator implantation for arrhythmias due to myocarditis
- 11.24: in the last 3 months increase in motor deficit and pain in lower limbs
- MRI and CT demonstrate stability in spinal lesions
- EMG demonstrate ongoing radiculopathy distal to L4 probably due to the effect of radiotherapy
- Therapy with MS Contin 30 mg x 3 and Depalgos 20 mg x 3 (OD) controls pain by 30% (NRS 7)



**IDD or
SCS?**

SCS



Outcomes
End of trial: 50% pain
control
No change in opioid
therapy
NRS 5
6 months FU: good pain
control

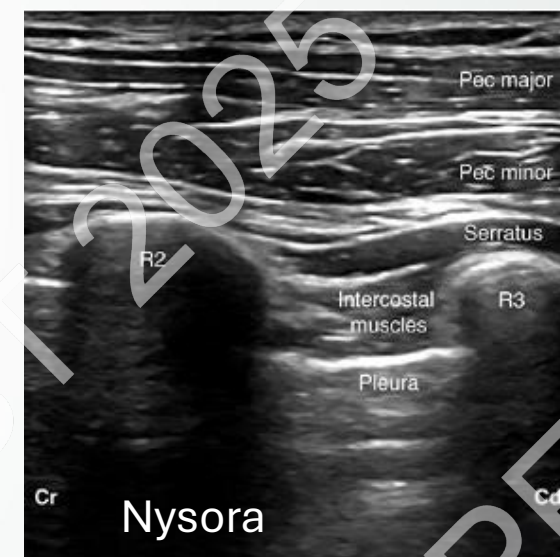


Case 2. CF, f 59y

- Celiac disease, rheumatoid arthritis in remission, fibromyalgia treated with cannabis oil
- 1.22: right quadrantectomy and axillary lymphadenectomy, no chemotherapy, radiotherapy
- After radiotherapy, skin erythema and recurrent nipple ulcers; pain in the breast, axillary and scapular regions and on the medial side of the arm
- Therapy: tamoxifen, duloxetine up to 60 mg/d suspended due to ineffectiveness and side effects; side effects from opioids and gabapentinoids

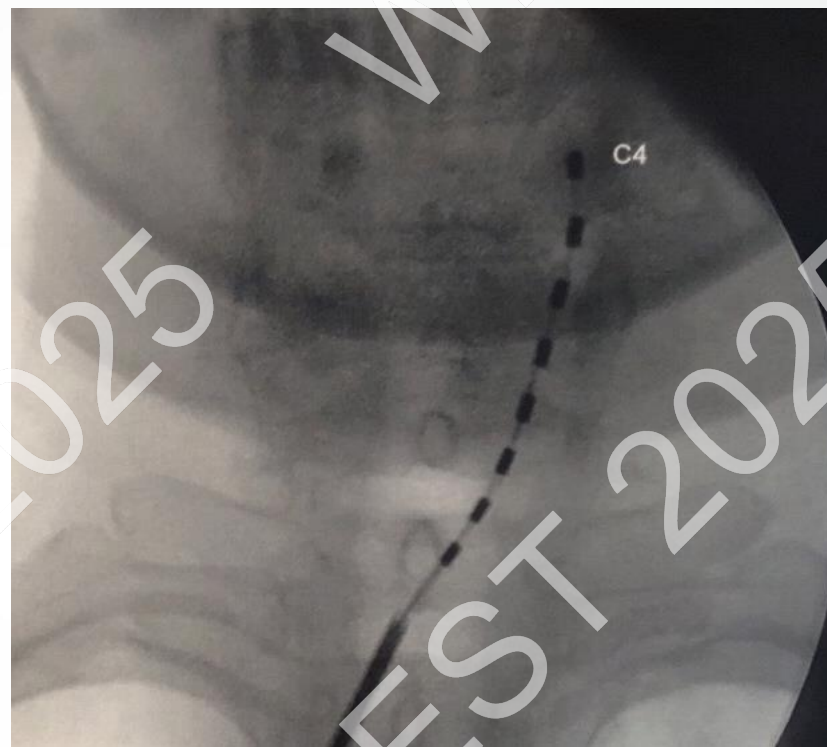
Pain evaluation

- 11.23: The patient refers continuous pain that disappears with sleep and episodes of stabbing pain. The patient is limited in shoulder abduction movements and in lifting weights due to increase of pain in the pectoral and axillary regions. She cannot wear a bra
- Tactile and thermal hypo/anaesthesia in a large area which affects the medial part of the arm, the sub-axillary region, the lateral breast and supra-mammary region and the lateral scapular region
- No change in pain intensity from intercostobrachial e long thoracic nerve blocks



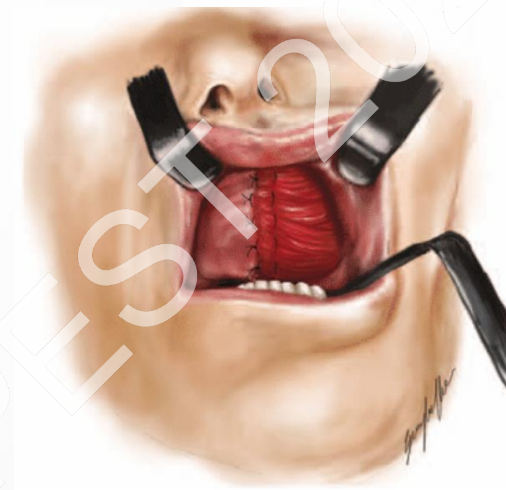
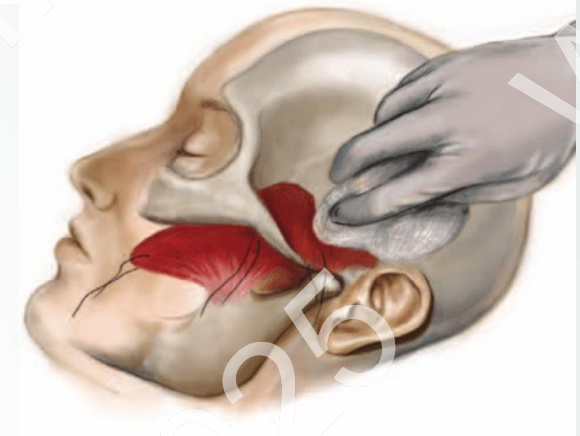
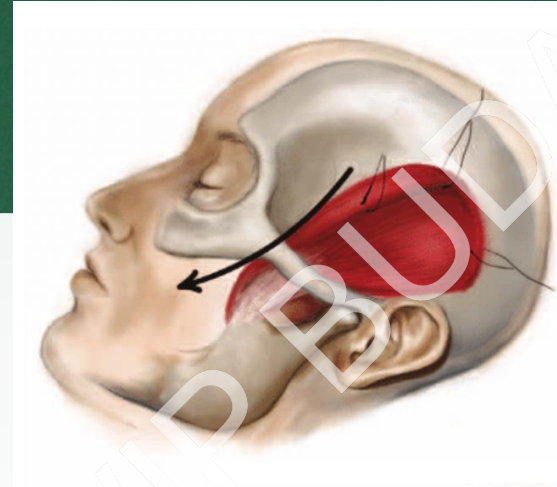
SCS

- SCS trial: painful area difficult to cover with paraesthesias
- 40% pain relief with pain now localized mainly at the nipple



Case 3. NB, m 51 y

- 5.23: surgery for removal of squamous cell carcinoma of the right maxillary sinus. Reconstruction of palate with temporalis muscle flap. Latero-cervical emptying complicated by infection
- After surgery, pain in the territory of the mandibular nerve, in the neck, shoulder and right upper limb



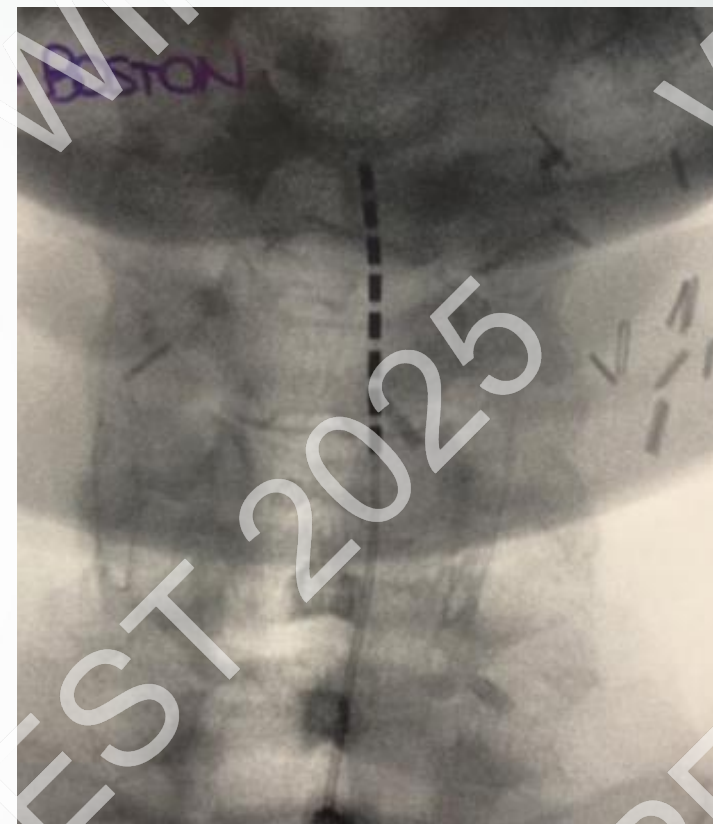


Patient evaluation

- 11.24: Minus in the right temporal area. Edema and rubor in mandibular and upper latero-cervical regions.
- Tactile and thermal anaesthesia in the territory of right V3 and cervical roots till C7, hypoesthesia in the territory of C8. Motor deficit of shoulder movements; he does not use the right upper limb because of pain and mouth opening is limited by pain
- Pain evoked by pressure on the TMJ and zygomatic area
- NRS 9 with Gabapentin 600 mg x 3, Fluoxetine 20 mg, Risperidone 0,50 mg x 2, Carbamazepine 200 mg x 2, Alprazolam 0,25 mg OD. No benefit from opioids, clonazepam, amitriptyline

SCS

- 4.25: Trial with a lead at C2 with good results on upper limb pain, some effect on facial pain
- 7.25: Pain from 9 to 4 in the neck and upper limb that he can move now. Pain 8 in the face. Still in therapy with Gabapentin 600 mg x 3 and Carbamazepine 200 mg x 2, Ketorolac 30 mg OD.
- Anaesthetic and steroid blockade of mandibular nerve behind the mandibular notch reduces pain to 2 and permits a wider mouth opening.
- I will try PRF on the mandibular nerve





Take at home message

SCS can be an option for neuropathic cancer pain

- In patients with good life expectancy; we can consider less invasive and temporary systems for advanced cancer
- Painful area is possible to cover with paraesthesias
- Cancer progression or scar tissue doesn't limit lead implant



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