

Role of superficial cervical plexus block in somatic referred cervical spine pain

INTRODUCTION

Referred pain is defined as an entity where pain is felt in the distribution of a nerve that does not belong to the actual source of pain, although the nerves share the same spinal cord segment as that of the pain source.^[1] We present a case series of three patients with chronic unilateral cervical origin pain, moderate-to-severe in intensity and being referred to the neck and facial region.

CASE REPORTS

Patient 1

A 45-year-old female reported continuous, moderate-to-severe pain in auricular, temporal, mandibular and upper neck areas for 2 years. The visual analog score (VAS) was 7 to 8 and pain aggravated on chewing solid foods. She obtained multiple consultations and received intraoral blocks for pain, but pain relief was suboptimal. There were no neurological symptoms in the upper limbs. Musculoskeletal pain, facet joint involvement, glossopharyngeal neuralgia, trigeminal neuralgia and cervical spondylosis were considered as differential diagnoses and evaluated. The blood investigations were normal, and neck radiograph revealed bilateral prominent styloid processes (20 mm). A cervical spine radiograph revealed reduced C5–C6 intervertebral disc space with multiple osteophytes. Magnetic resonance imaging (MRI) neck reported cervical spondylosis with diffuse circumferential disc bulge at C5–C6 and C6–C7 levels without canal stenosis. Based on symptomatology, a diagnostic left side glossopharyngeal nerve block was performed but did not provide pain relief. Mandibular nerve blocks provided for mandibular pain at two different settings also could not provide adequate pain relief. Consequently, a clinical diagnosis of cervical spondylosis with somatically referred anterior neck and facial pain from cervical spine tissue was made considering magnetic resonance imaging (MRI) findings and the territorial distribution of pain. An ultrasound-guided (USG) superficial cervical plexus (SCP) block with 7.0 ml of 0.2% ropivacaine

and 40 mg triamcinolone was performed. This resulted in resolution of pain (VAS of 2) from all the painful areas. During follow-up of 1 year, patient reported a VAS score of 0. The World Health Organization quality of life-BREF (WHOQOL-BREF) raw score^[2] improved from 45 to 117.

Patient 2

A 37-year-old female had mandibular and anterior neck pain for 1 year with no motor or sensory deficit. Cervical spine X-ray showed degenerative changes at C4–C5 and C5–C6 levels. MRI evaluation showed multilevel disc desiccations with diffuse disc bulge at C4–C5 and C5–C6 levels. The clinical diagnosis was degenerative cervical spondylosis with disc bulge and somatically referred anterior neck pain from cervical tissue. A SCP block (as described above) resulted in pain reduction from pre-block VAS of 7 to zero. The WHOQOL-BREF raw score^[2] improved from 77 to 98 during follow-up of 6 months. The patient is now pain-free but occasionally takes analgesics for mild pain.

Patient 3

A 35-year-old female reported moderate pain and hyperalgesia in anterior part of the neck and submandibular area for 2 years. The patient reported no pain on neck movements or any other neurological symptoms. Medical management of hypothyroidism was optimal with oral thyroxine for 2 years. The cervical spine X-ray was normal, but MRI revealed C5–C6 disc protrusion along with thecal sac compression and compromised bilateral lateral recesses. Similarly, in this patient, the topographic distribution of pain represented the distribution of SCP. A diagnostic USG SCP block resulted in complete relief of pain. Pain recurred after 1 month and a pulsed radio frequency (PRF) treatment of SCP for 8 min at 42°C was performed. At 6 months follow-up, the pain was stabilised with oral gabapentin 100 mg HS. WHOQOL-BREF raw score^[2] improved from 46 to 109.

None of the above patients reported any adverse effects.

DISCUSSION

The present case series highlights the importance of the first use of less invasive SCP block over conventional more invasive interventions in managing the pain of cervical spine origin. The above three patients

appeared to have had pain generator in degenerative cervical spine and para cervical structures (ligaments, musculature, facet joint, osteophytes or degenerative tissue)^[1,3] with pain transmission to neck, facial or/and mandibular regions. Interestingly, MRI revealed disc herniation at C5–C6 and C6–C7 intervertebral space, but the pain was distributed to C1–C4 area in the neck and face. Published medical literature supports the observation that pain from the actual territory of nerve is transmitted in cephalic direction rather than caudal.^[3] The pain from C5–C7 segments in above patients, therefore, might have been referred cranially toward C1–C4 cervical segments and thereafter to face and periauricular area through SCP. Possibly, an occult pain generator may have been present in the C1–C4 distribution of degenerated cervical spine producing above symptoms which was not evident on MRI.

The topographical correlation of cutaneous nerve supply of SCP and the distribution of pain provided the basis for performing SCP blocks in the present case series. Main reasons for selecting SCP block were; first, SCP is confluence of superficial branches of nerves transmitting somatically referred pain from the neck and face. These include four cutaneous branches: greater auricular (C2–C3), transverse cervical (C2–C3), lesser occipital (C2), supraclavicular nerve (C3–C4), and two posterior roots of spinal nerve; pre-(C2–C3) and post-auricular nerve (C3–C4) causing periauricular pain.^[4] Second, the convergence-projection theory explains that when multiple nerves converge onto a single shared neural pathway, the central nervous system becomes unable to differentiate the origin of pain. Moreover, there is sometimes unmasking of silent or latent synaptic connections that causes the activation of nociceptive pain fibres.^[5] Third, patients could have coexisting pain generators in C1–C4 cervical spine as describe above. In that case, cutaneous direct representation of pain in the neck and face was also a distinct possibility.

The central referral of pain from cervical to trigeminal system (mandibular nerve) could be ascertained from the fact that the mandibular nerve block did not provide pain relief in the first patient. In addition, there is peripheral referral of pain due to sensory overlapping of auriculotemporal branch of mandibular nerve and auricular branches of SCP. Due to convergence pathway, the brain fails to differentiate their origin interprets these impulses as originating from same areas.^[5]

In the present case series, diagnostic SCP blocks with local anaesthetics provided relief of pain for few weeks.^[6] The benefit beyond this period in patients one and two was possibly due to breaking of pain cycle or due to the addition of steroids as adjuvants. In patient number 3, the second SCP treatment with PRF was performed which extended the duration of pain relief and resulted in resolution of pain. Further studies are required to strengthen our findings.

CONCLUSION

Pain relief with less invasive SCP block provided a distinct possibility of its applicability in patients with somatically referred anterior neck, face or mandibular pain from cervical origin without any neurological deficit.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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