Case Series

Analgesic efficacy of stellate ganglion block in head and neck cancer pain: A case series

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Abstract

Patients with head and neck cancer (HNC) have ongoing pain but Stellate ganglion block which is a sympatholytic block may be a viable therapy for treating it. The data were retrospectively collected from five histopathologically confirmed HNC patients who had completed chemotherapy and radiation doses. Stellate ganglion block was given to these patients and was subsequently monitored for 3 months to assess pain alleviation and overall satisfaction. Over a 3-month period, there was a decrease in the pain levels with a better quality of life so the stellate ganglion block can be a promising modality for reducing the pain of HNC.

Keywords: Analgesics, head and neck neoplasm, stellate ganglion block

Introduction

Head and neck cancer (HNC) is the seventh most common disease worldwide, killing 325,000 people each year.[1,2] Pain is the most common initial symptom in 20% to 50% of cancer patients, but it can be as high as 85% in HNC patients.[3-5] This has a significant impact on such individuals' mental health, making them prone to depression and lowering their quality of life. Because of the varied mechanisms of pain generation and complex innervations of anatomical regions, we must use a multimodal strategy to address pain in HNC cancer. Pain has an impact on cancer rehabilitation strategies. Distinctive first-line therapy comprises the use of oral drugs, such as opioids, and combinations with other pain-relieving medications, along with lifestyle adjustments. However, most of the time, these medications manage pain insufficiently and cause toxicities, necessitating target-oriented interventional pain management intervention.[1] Sympathetic inhibition of the stellate and sphenopalatine ganglia is largely used to manage pain caused by HNCs in the temporomandibular joint, upper limb, and orofacial regions. Since the sympathetic nervous system is involved in the pain pathway, Stellate ganglion block (SGB), being a sympatholytic block, may be a viable therapy for treating HNC-related pain.[2]

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Case Presentation

Case 1

A fifty-year-old male with unresectable, right buccal mucosa carcinoma had progressive right facial pain. He underwent palliative radiation and chemotherapy. His pharmacological treatment consisted of acetaminophen, gabapentin, Oxcarbazepine, and morphine; Due to tumor location, a right SGB was given and following the block, the patient's Brief Pain Inventory (BPI) (short form) Hindi version decreased from 5/10 to 1/10. He reported improvement in pain within 5 minutes of the procedure. The patient was satisfied with the block and had consistent pain relief postprocedure for up to 3 weeks.

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Case 2

A forty four-year-old male with chronic right facial pain on pregabalin, tramadol, and paracetam had a history of inoperable squamous cell carcinoma (SCC) cheek earlier treated with a right selective neck dissection and radiotherapy. Right SGB was given and his pain decreased from 8/10 to 5/10 on BPI-H (short form). Six weeks later, she returned with 9/10 pain along her right cheek and underwent a second SGB block using the same technique and drug with postprocedure pain of 4/10. She was very satisfied with the two blocks and reported pain relief at 6 weeks also.

Case 3

Fifty five-year-old women with persistent left buccal mucosa carcinoma after radiotherapy were referred to our side for burning, tingling pain despite treatment with acetaminophen, tramadol, and pregabalin. A left SGB block was planned but due to location of the tumor and anatomical constraints the block failed and finally a left SGB was given. Her pain decreased from 7/10 to 3/10 on BPI-H (short form). She was very satisfied with the block and was discharged the following day, but unfortunately lost to follow-up.

Case 4

A 63-year-old male with primary stage IVa SCC of the tongue was referred for right tongue pain and radiation to the right face and ear. The patient was kept on paracetamol, nonsteroidal anti-inflammatory drugs, and tramadol with incomplete relief of pain. He was also kept on IV (PECA) patient-controlled analgesia, but pain relief was not obtained due to compliance issues. The patient did not want to take morphine in oral form so refused. An SGB was planned and pain decreased from 6/10 to 2/10 on BPI-H (short form) patient had consistent pain relief until he died 20 days after the block.

Case 5

A 72-year-old male with right facial pain on gabapentin, tramadol, and paracetamol had a history of buccal mucosa which was found inoperable and had cycles of radiation and was referred for pain management. Right SGB was given and his pain decreased from 9/10 to 4/10 on BPI-H (short form). Pain was relieved up to 4 weeks after which she returned with a similar amount of pain. A repeat SGB was then performed using the same technique and the drug concentration. His facial pain was reduced and is now well-controlled on medication.

This case series was created with the goal of evaluating pain reduction and quality of life improvement in patients being treated for HNC. From August 2021 to September 2023, data were collected retrospectively from the Department of Anesthesiology (Division of Pain Medicine) at a government tertiary care hospital in Uttarakhand, India. Histopathologically confirmed HNC cases more than the age of 18 years were included in the study, who had completed chemotherapy and radiation doses and no further surgical intervention was planned. Any patients with vocal cord paralysis, heart disease, pregnancy, or metastasis of the disease were excluded and quantitative techniques were used for data collection.

We present a case series of five cases of HNC effectively handled with SGB resulting in good pain alleviation.

A physician who was not participating in the study documented pain scores in the form of the BPI short version immediately before and after each block. The patients were subsequently monitored for 3 months to assess pain alleviation and overall satisfaction with the procedure. Over a 3-month period, there was a decrease in the pain levels with a better quality of life for the patient [Table 1].

According to recommendations of the American Society of Anesthesiologists, the block was performed on each patient inside the operating room under rigorous asepsis and monitoring. A preliminary scan was carried out using a high-frequency linear ultrasound probe (6-13 MHz, M Turbo, Sonosite, Gurugram, Haryana, India) with the patient in a supine position with a pillow under the neck to stretch the neck and head turned to the opposite side for a good view. After a quick scan, the transducer was placed anterior to the sternocleidomastoid muscle at the level of the cricoid cartilage. It was moved laterally to visualize the sixth cervical vertebra, which has the existing nerve root of C6, a large anterior tubercle, and a small posterior tubercle. The Longus coli (LC) muscle at this point appears as an oval structure over the base of the transverse process and the vertebral body and the Longus Capitus (LCa) Muscle is found lateral to the carotid artery. Added scanning was carried out using the Doppler mode to identify any nearby vascular structures. Following this, the patient's skin was prepared with 2% chlorhexidine and the puncture site was anesthetized with 2% lignocaine just next to the transducer. We employed a short axis view with needling in the "In-plane" view for all patients [Figure 1]. A 20 G needle was inserted and targeted the soft tissue plane between the prevertebral fascia between the LC and LCa muscle. One mL of

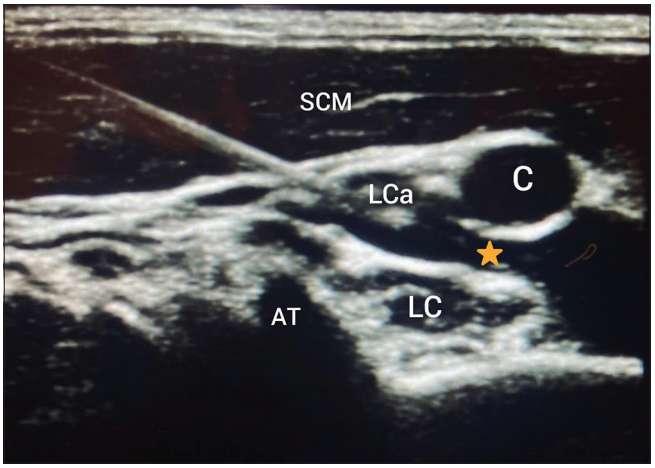

Figure 1: Sonoanatomy of SGB and spread of the injectate in SGB between the prevertebral fascia between the LC and LCa muscleSCM: Sternocleidomastoid C: Carotid LC: Longus Coli LCa: Longuscapitus AT: Anterior tubercle of C6 N: C6 nerve root

Table 1: Case description of the study participants

Case no.	Age/Sex (Year)	Malignancy	Chief complaints	Management	Pre-block BPI score (Hindi)	Post block BPI score (Hindi)	Patient satisfaction with block	Requirement of second block	Time till pain relief
1.	50/M	Carcinoma buccal mucosa	Progressive right sided facial pain	Persistent pain after radiotherapy and chemotherapy, Pain managed with – acetaminophen, oxcarbazepine, morphine. SGB performed	5/10	1/10	Yes	No	3 weeks
2.	44/M	Squamous cell Carcinoma	Chronic right facial pain	Radiotherapy and right selective neck dissection. The appropriate SGB was assigned	8/10	5/10	Yes	Yes, 3 weeks after block	6 weeks
3.	55/F	Carcinoma buccal mucosa	Burning tingling pain on the left face	4 cycles of radiotherapy done. Pain medically managed with tramadol and acetaminophen. Left sided SGB given	7/10	3/10	Yes	No	Lost to follow up
4.	63/M	Squamous cell carcinoma	Right sided tongue pain	Right sided ear and face received radiation therapy. Tapentadol is given to manage pain. Right sided SGB performed	6/10	2/10	Yes	No	Patient died 20 days after the block
5.	72/M	Carcinoma buccal mucosa	Right sided tongue pain	Tumor found inoperable; radiation given. Patient on	9/10	4/10	Yes	Yes, 2 weeks later	

normal saline was injected to confirm the needle tip. The drug mixture of 3 mL of 1% lidocaine and 8 mg dexamethasone was injected after negative aspiration if the spread was deemed sufficient. Any hematoma, hoarseness of voice, dysphagia, and intravascular spread were checked for right away while the patient was being monitored in the recovery room. Development of Horner's syndrome and a temperature difference (>1.5°C) in the upper limbs confirmed successful delivery of the block.[3]

Results

A physician who was not participating in the study documented pain scores in the form of the BPI short version immediately before and after each block. The patients were subsequently monitored for 3 months to assess pain alleviation and overall satisfaction with the procedure. Over a 3-month period, there was a decrease in the pain levels with a better quality of life for the patient [Table 1].

Discussion

The stellate ganglion, also known as the cervicothoracic ganglion, is an amalgamation of the sympathetic ganglions of the inferior cervical and first thoracic regions. It is located anterior to the first rib's neck and the seventh cervical vertebral body. The ganglion is roughly 2.5 cm long, 1 cm wide, and 0.5 cm thick.[6] In the case of oral cancer, mediators secreted by cancer cells stimulate Ad and C fibers, resulting in discomfort. As mediators, prostaglandins, bradykinin, and chemokines are implicated.[7] According to a study conducted by Cardona-Guarache *et al.*, cancer mass size has no link with pain, and the mechanism of pain is primarily related to perineural infiltration and nociceptive hypersensitivity.[9]

Although SGB was used to reduce pain in this case series, it demonstrates that sympathetic mediation of pain is a significant component in cancer-related pain because SGB is a block of the sympathetic ganglion. As a result, increased blood flow across the sympathetic route following blockage may be connected to pain reduction. The block also reduces vascular wall edema, which may lead to a reduction in headaches after SGB blocks.[8,9] Despite the fact that SGB has demonstrated a variety of potential benefits in the treatment of persistent cancer-related pain in the face and upper extremities, the therapy should be used with caution. Because of its close proximity to essential tissues, problems such as pneumothorax, intrathecal injection, intravascular injection, and nerve injury have occurred.[10] Although no such complications were observed in our cases, in a study of SGB, complications were observed in 11.1% of patients who received the therapy (33 of 287), with hoarseness and dysphagia being the most common (54.6%), followed by formation of a local hematoma (33.3%), pneumothorax (3%), and Horner's syndrome on the opposite side (3%).[10] As a result, image-guided procedures are strongly suggested to reduce the risk of severe problems. So, while not technically viable, numerous researchers have used computed tomography and magnetic resonance imaging to guide the block to the correct location. In our instances, ultrasonography is a popular and less time-consuming approach for

SGB because it quickly visualizes the nearby structures.[6] However, in cancer patients, there is a risk of deformity of the normal anatomy and scarring, thus extra care must be taken to inject at the correct spot, for which a preprocedure radiological imaging should be performed to fully identify the region of concern. As in previous research, all patients reported a significant reduction in pain scores and were delighted with the pain relief.[10] The majority of individuals experienced immediate pain relief, and in two cases, a second SGB was necessary 4-6 weeks following the initial block. There are various limitations to our study. The short sample size, loss of follow-up, and recall bias limit data accuracy, making it difficult to analyze strong relationships.

Conclusion

All of the individuals in our study had a reduction in HNC-related pain. For long-term treatment, a second dose of SGB may be required after 3-4 weeks of the initial dose. A larger sample size and longer duration of research are required to assess the block's long-term effect.

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Conflicts of interest

There are no conflicts of interest.

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