

Stellate ganglion block for the treatment of olfactory and gustatory dysfunction in patients with long COVID-19

Uzun COVID-19 hastalarında koku alma ve tat alma fonksiyon bozukluğunun tedavisi için Stellat ganglion bloku

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Severe acute respiratory syndrome-coronavirus 2 (SARS-CoV-2) infection, the causative agent of novel coronavirus disease 2019 (COVID-19), has caused a major pandemic, with significant mortality and morbidity worldwide. It usually takes seven to 10 days after the onset of symptoms to recover from mild SARS-CoV-2 infection and three to six weeks for severe/critical illness.^[1] However, long-term follow-up of patients recovering from COVID-19 has shown that one or more symptoms persist in a significant percentage of people even weeks or months after COVID-19. Long COVID-19 or post-COVID-19 condition is a term used to describe the presence of a variety of symptoms even weeks or months after recovering from SARS-CoV-2, regardless of viral status. Long COVID-19 is characterized as a disorder with a broad spectrum of clinical manifestations. The most common neurological symptoms of long COVID-19 include fatigue, 'brain fog', headache, cognitive impairment, sleep, mood, smell or taste disturbances, myalgias, sensorimotor deficits and dysautonomia. In COVID-19, dysautonomia, or more specifically increased sympathetic activity, can have adverse effects on pulmonary, cardiovascular, renal, metabolic, immune and neuroinflammatory homeostasis.^[2]

Although the complete mechanism of action is unclear, there are some reports on the use of

stellate ganglion block (SGB) for the treatment of long COVID-19 symptoms and olfactory dysfunctions with different etiologies.

In this article, we report the positive clinical results we observed after SGB in long COVID-19 patients who presented to our clinic with complaints of olfactory and gustatory disorders.

Case 1– A 27-year-old female patient presented to our clinic with persistent multiple symptoms after a moderate case of COVID-19 nine months earlier, including cacosmia, cacogeusia, fatigue, difficulty in concentrating, sleep disturbances, muscle pain and headaches. Despite previous unsuccessful treatments, including olfactory training, corticosteroids and duloxetine, her symptoms persisted and she had lost 7 kg. She had no history of smoking or other health problems. Brain magnetic resonance imaging (MRI) scans showed no abnormalities.

The patient underwent a right-sided SGB under ultrasound. A 6 mL solution of mixed bupivacaine and triamcinolone was injected. She developed right-sided Horner's syndrome after the procedure. The next day, she reported improvement in her symptoms on that side, in particular regaining the ability to taste coffee and chocolate. Two days later, she received a left-sided SGB due to persistent symptoms on that side. Her condition was closely monitored, with follow-up visits at one week and two

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months post-procedure showing significant symptom relief and improved quality of life. A written informed consent was obtained from the patient for publication of this case report.

Case 2– A 24-year-old female patient with a history of two episodes of mild COVID-19 eight months apart presented with unresolved anosmia, ageusia, myalgia and headaches. Her gustatory and olfactory disturbances initially resolved after the first infection, but remained after the second. Despite two months of olfactory training, her sensory problems persisted. She had no history of taste or smell problems, did not smoke and had no other health problems. Brain MRI scans were normal.

The patient received a right-sided block first, followed two days later by a left-sided block with a 6 mL solution of mixed bupivacaine and triamcinolone. Both procedures resulted in Horner's syndrome on the affected sides. At her follow-up visit a week later, she noted some relief, but felt it was insufficient. However, after repeating both blocks at 48-hour intervals, her follow-up at one week and two months also showed an unsatisfactory reduction in severity. When she was informed that the procedure could be repeated, she reported that her current condition was acceptable and that she did not wish to undergo any further procedures.

Both cases were assessed using a numerical rating scale (from 0 - no complaint to 10 - complaints are intolerable) for symptom severity. Detailed results are

displayed in Tables 1 and 2 for each case, respectively. A written informed consent was obtained from the patient for publication of this case report.

There are few case reports in the literature of SGB application to long COVID-19 patients and improvement in their symptoms after the procedure. Although Liu and Duricka^[3] reported complete recovery of olfactory and gustatory dysfunctions at two-month follow-up in their case series, in our cases we observed 90% recovery in the first patient and roughly 40% recovery in the second patient. The lack of desired improvement of gustatory and olfactory dysfunction in our second case may be because the patient had two times SARS-Cov-2 infections eight months apart, and a larger area of the sensory epithelium was affected, possibly with a more profound destruction of the epithelium that included the death of a larger number of sensory receptor neurons.^[4] On the other hand, headaches were completely resolved in both of our cases. The fact that in both previous reports and in our cases, significant improvement in all other symptoms, such as impaired concentration, sleep disturbance, fatigue and myalgia, was seen shortly after SGB may be a basis for the important role of dysautonomia in the pathophysiology of long COVID-19 cases.

There are also publications on the successful results of SGB application in cases with olfactory sensory impairment due to different etiological conditions. A study by Lee et al.^[5] showed that

Table 1. Assessment of the severity of complaints with numerical rating scale (NRS [0-10]) before and after the procedure (Case 1)

	Pre-procedure assessment	1 week after the procedure	2 months after the procedure	Achieved improvement (%)
Cacosmia	10	1	1	90
Cacogeusia	10	1	1	90
Fatigue	7	0	0	100
Impaired concentration	8	1	1	87,5
Sleep disturbance	6	2	1	83,3
Myalgia	7	3	2	71,4
Headache	5	0	0	100

Table 2. Assessment of the severity of complaints with numerical rating scale (NRS [0-10]) before and after the procedure (Case 2)

	Pre-procedure assessment	1 week after the 1 st procedure	1 week after the 2 nd procedure	2 months after 2 nd procedure	Achieved improvement (%)
Anosmia	8	5	5	5	37,5
Ageusia	7	4	4	4	42,9
Myalgia	3	1	1	1	66,7
Headache	2	0	0	0	100

superior cervical ganglionectomy enhanced the regeneration of olfactory receptor cells in zinc sulfate-induced mouse anosmia. Moon et al.^[6] reported that of 37 patients with anosmia or hyposmia with different etiologies, 15 (40.5%) responded to SGB with significant improvement in their symptoms.

In conclusion, the absence of reliable and effective treatment for olfactory, gustatory and other symptoms associated with dysautonomia in long COVID-19 cases makes SGB an interesting therapeutic option for these patients. However, evidence for the use of SGB to attenuate persistent parosmia and dysgeusia is limited by a few case reports. Well-designed, multi-center studies are needed to establish the efficacy and support the use of SGB as a therapeutic modality for dysautonomia-associated long COVID-19 symptoms.

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