

# An unexpected complication following lumbar epidural steroid injection: Hiccups

## Lomber epidural steroid enjeksiyonu sonrası beklenmedik bir komplikasyon: Hıçkırık

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### ABSTRACT

Interventional spine procedures are widely used non-surgical approaches for the management of acute and chronic pain. Although usually considered safe, these procedures may still be associated with temporary and minor complications, including hiccups. In this article, we report a rare case of a 60-year-old male patient with low back pain who developed recurrent hiccups following a lumbar epidural steroid injection. In conclusion, the exact mechanism of hiccups remains unclear, and their relationship with the level of epidural injection or the specific drug mixture used is not well established. As hiccups following epidural injections have been insufficiently documented in the literature, this case aims to highlight hiccups as a potentially under-recognized adverse effect of epidural steroid injections in interventional pain management.

**Keywords:** Adverse effects, epidural steroid injection, hiccups, interventional spine procedures, lumbar spine, pain management.

### ÖZ

Girişimsel omurga prosedürleri, akut ve kronik ağrının yönetiminde yaygın olarak kullanılan cerrahi dışı yöntemlerdir. Genellikle güvenli kabul edilmekle birlikte, bu işlemler geçici ve minör komplikasyonlarla, örneğin hıçkırık ile ilişkili olabilir. Bu makalede, bel ağrısı nedeniyle lomber epidural steroid enjeksiyonu sonrası tekrarlayan hıçkırık gelişen 60 yaşında erkek bir hasta sunuldu. Sonuç olarak, hıçkırığın kesin mekanizması halen net değildir ve epidural enjeksiyon düzeyi veya kullanılan ilaç karışımı ile ilişkisi iyi anlaşılmamıştır. Epidural enjeksiyon sonrası hıçkırık olgularının literatürde yeterince bildirilmemiş olması nedeniyle, bu olgu girişimsel ağrı yönetiminde epidural steroid enjeksiyonlarının potansiyel olarak gözden kaçabilen bir yan etkisine dikkat çekmeyi amaçlamaktadır.

**Anahtar sözcükler:** Yan etkiler, epidural steroid enjeksiyonu, hıçkırık, girişimsel omurga prosedürleri, lomber omurga, ağrı yönetimi.

### INTRODUCTION

Interventional spine procedures are commonly used non-surgical methods for managing acute and chronic pain. The main goal of these procedures is the relief of radicular pain and deemed as a therapeutic option in the cervical, thoracic, or lumbar spine. Lumbar epidural steroid injection is a common procedure. Injectate typically is composed of a combination of anesthetics and steroids.<sup>[1]</sup>

Corticosteroid injections help reduce inflammation and can be effective when delivered directly into the painful area. However, these injections are not free of complications.<sup>[2]</sup> Rare side effects that may occur

including weakness, dizziness, fatigue, skin changes, and osteoporosis. Extremely rare adverse events include infection, bleeding, dural puncture, a nerve damage, and hiccups. In this article, we report a rare case of hiccups following lumbar epidural steroid injection.

### CASE REPORT

A 60-year-old male patient presented with chronic lower back pain. On admission, his Visual Analog Scale (VAS) was an 8-10/10. Magnetic resonance imaging (MRI) revealed findings consistent with L4-L5 and L5-S1 lumbar disc herniation and degenerative disc disease. Physical examination showed normal reflexes and sensations. His medical history

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revealed hypertension, chronic arterial disease. Once conservative treatment including opioids did not provide pain alleviation, lumbar epidural steroid injection was planned.

The patient was taken to the operating room where standard monitoring was conducted. Vital signs were stable and continuously monitored. The patient was placed in prone position on the operating table with a cushion under the abdomen. The sterile area was prepared. The patient was draped in a sterile manner. The fluoroscopic image of L5-S1 interlaminar space was observed in the anteroposterior (AP) position and, then, an 18-gauge epidural needle was inserted into the L5-S1 intervertebral space under fluoroscopic guidance using the loss of resistance technique, and a 10 mL solution containing 16 mg of dexamethasone (2 mL) and 10 mg of 0.5% bupivacaine (2 mL) was administered slowly. After the procedure, the patient's hemodynamic status remained stable, and the VAS for pain decreased from 8 to 0. No significant complaints were noted during the early post-intervention period. The patient was discharged without any complaints. However, hiccups started 10 hours after the injection and continued for about 60 hours. Each episode of hiccups lasted about 45 min and, then, resumed after a 15-min break. The patient attempted traditional, non-pharmacological treatment methods that did not alleviate the symptoms. These techniques included breath holding, Valsalva maneuvers, pressing on the eyeballs, sipping cold water, and pulling the tongue. Twenty-four hours after the procedure, 25 mg of oral chlorpromazine was administered, which relieved hiccups for about 4 hours. During follow-up, the hiccups returned and the patient was routinely given 25 mg oral chlorpromazine twice daily, which resulted in a reduction in symptoms and cessation of hiccups.

A written informed consent was obtained from the patient for publication of this case report.

## DISCUSSION

Hiccups are synchronous diaphragmatic flutter and singultus caused by a sudden, reflexive spasmodic contraction of the diaphragm, which is followed by an abrupt closure of the glottis and associated vocalization. The entire hiccup process occurs within 35 msec.<sup>[3]</sup> The mammalian hiccup reflex involves afferent pathways (including the phrenic nerve, vagus nerve, or thoracic sympathetic fibers from T6-T10), a central processor (the medulla oblongata), and an efferent pathway (the phrenic nerve).<sup>[4]</sup> Any physical, chemical, inflammatory, or neoplastic irritant affecting any component of this reflex arc can trigger

hiccups.<sup>[5]</sup> Hiccups are mainly classified based on their duration: transient (lasting sec to min); persistent (lasting 48 hours to one month); and intractable (lasting more than one month). Recurrent hiccups are characterized by repeated episodes lasting several minutes or longer.<sup>[4]</sup>

Causes are often idiopathic, it is known that hiccup has over 100 etiologies.<sup>[6,7]</sup> The causes of hiccup are many and include electrolyte imbalance, nutritional deficiencies, gastrointestinal disorders and instrumentation, cardiovascular disorders, renal impairment, central nervous system (CNS) disorders and drugs.<sup>[3,8]</sup>

There is no evidence that local anesthetic agents or steroids used in epidural injections cause hiccups; however, cases of hiccups developing after epidural injection have been reported. Beyaz<sup>[9]</sup> reported a 61-year-old male patient with a history of low back pain over 10 years complaining of hiccups subsided 48 hours later, after single shot lumbar epidural steroid injection. Slipman et al.<sup>[7]</sup> reported a case in which betamethasone was used, and there have been cases reported of persistent hiccups following betamethasone epidural injection with and without local anesthetic. The cause of hiccups was attributed to the steroid agent in the mixture. McAllister et al.<sup>[10]</sup> reported a patient who developed persistent hiccups following the epidural administration of bupivacaine was noted. The use of saline instead of diluted bupivacaine during epidural steroid injection did not result in hiccups; however, subsequent postoperative epidural analgesia with bupivacaine led to a recurrence of the hiccup. These cases suggest that steroids and local anesthetic agents in epidural injections may have a triggering effect on hiccups, and that the presence or absence of certain agents in the mixture can influence this complication. Kaydu et al.<sup>[11]</sup> reported a patient with chronic back pain who developed hiccups secondary to a caudal epidural steroid injection. Abubaker et al.<sup>[12]</sup> reported persistent hiccups after cervical epidural steroid injection without no direct association between the level of epidural injection and the development of hiccups. Ritz et al.<sup>[13]</sup> reported persistent hiccups following cervical epidural steroid injection with betamethasone. These cases indicate that hiccups induced by epidural steroid injections may occur independently of the injection level and suggest that steroid agents may play a potential triggering role in this complication.

The volume of the solution injected into the epidural space could influence the mechanism of hiccups by

modifying the cerebrospinal fluid balance; hiccups may arise due to compression of the dural sac as a result of this volume effect.<sup>[14]</sup> Different steroids have been implicated in various case reports, and switching from one steroid to another has been observed to prevent recurrences.<sup>[15]</sup>

In patients with persistent hiccups lasting longer than 48 hours, it is important to consider potentially life-threatening etiologies before proceeding with a treatment algorithm. These potential causes include vertebral artery dissection, epidural hematoma, spinal cord infarction, and stroke. Nonetheless, frequent lack of definitive etiological understanding in presentations of hiccups leads to considerable variation in treatment approaches. Although not validated in randomized-controlled trials, physical maneuvers to terminate hiccups may be successful if the hiccups last for less than 48 hours. Some of these techniques for vagal stimulation include breath holding, Valsalva maneuvers, pressing on the eyeballs, sipping cold water, and pulling on the tongue. Treatment protocols typically start with non-pharmacological and conservative methods, advancing to pharmacological interventions, if needed. Treatment usually begins with monotherapy including gabapentin, baclofen, and pregabalin, and may escalate to dual therapy with agents such as metoclopramide and chlorpromazine. In most persistent cases, options may include phrenic nerve blocks and peripheral nerve stimulation.<sup>[4]</sup>

In conclusion, hiccups are a complication of epidural steroid and local anesthetics injections, and it is of utmost importance to inform patients undergoing epidural injections about this potential side effect. When hiccups occur, patients should be reassured that this condition is benign and typically resolves spontaneously without the need for treatment. Given that the exact mechanism of hiccups is still unclear and considering that hiccups are regarded as a rare complication of epidural injections, their occurrence may be independent of the level of injection or the type of drug mixture used. Since cases of hiccups following epidural injections have not been sufficiently documented in the literature, we believe that further case reports may help elucidate the etiology and determine the true incidence of this complication.

#### Author Contributions

E.B., E.Y.A.: Idea/concept, design, analysis and/or interpretation, literature review, references and fundings; E.Y.A.: Control/supervision, critical review; E.B.: Data collection and/or processing, writing the article.

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