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Case Report

Complications of Nausea, Vomiting, and Headache after Epidural Steroid Injection in Two Elderly Patients after Multilevel Lumbar Surgery: A Case Series

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ABSTRACT

Epidural steroid injection is an effective method for controlling spinal radicular pain. However, in elderly patients with a history of lumbar fusion surgery, anatomical changes can lead to complications such as headache, nausea, and vomiting after the injection. In this report, two patients, 70 and 75 years old, with a history of multilevel lumbar fusion surgery who developed these complications after epidural injection are presented. Conservative treatment, including furosemide and 3% hypertonic saline, was associated with complete improvement of symptoms.

Introduction

Epidural steroid injection has gained widespread use as a minimally invasive method for relieving radicular pain caused by spinal disorders [1-2]. This technique alleviates pain through the anti-inflammatory effects of steroids and by temporarily blocking nerve transmission [3-4].

However, in patients with a history of spinal surgery, anatomical alterations and fibrotic scar formation may lead to complications such as headache, nausea, and vomiting, possibly due to drug spread into the subarachnoid space and increased intracranial pressure [5-6].

In this report, we present two elderly patients with a history of spinal fusion surgery who developed headache, nausea, and vomiting following epidural steroid injection.

Case Report

Case 1:

A 70-year-old man, with a history of five-level lumbar fusion performed three months earlier, presented for management of radicular pain.

If you'd like, I can continue translating the rest of your case descriptions in the same formal medical style so the whole report is consistent and ready for publication.

Preparation and Injection

A 20-gauge intravenous cannula was inserted into the patient's right hand. After preparation, the patient was placed in a sitting position. The skin over the lumbar region was shaved, disinfected with 2% chlorhexidine, and prepared under full sterile conditions (prep and drape). Following local anesthesia, the epidural space was identified at the L3–L4 level using an 18-gauge Tuohy needle and the loss-of-resistance technique.

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A mixture of 2 mL of 0.2% ropivacaine and 40 mg of triamcinolone (total volume: 10 mL) was then slowly injected. Epidural injection is performed using a Tuohy needle, the tip of which is positioned within the epidural space, located between the ligamentum flavum and the dura mater. This space is typically identified by the loss-of-resistance technique, in which the operator applies gentle pressure to the syringe plunger and perceives a sudden decrease in resistance as the needle passes through the ligamentum flavum into the epidural space [7-8].

Baseline vitals prior to injection

Oxygen saturation on room air 98%, heart rate 76 bpm, blood pressure 130/80 mmHg

Post-injection complications

Forty-five minutes after the injection, the patient established severe headache, nausea, and vomiting. Vital signs at that time were oxygen saturation 97%, blood pressure 135/85 mmHg, heart rate 85 bpm, and the neurological examination was unremarkable.

Treatment

Intravenous furosemide 20 mg and hypertonic saline 3% given at a rate of 5 mL/min, with close monitoring. Symptoms resolved within six hours, and the patient was discharged without further complications.

Case 2:

A 75-year-old woman, with a history of a three-level lumbar fusion performed five months earlier, presented with similar radicular pain. The preparation, injection, and monitoring process were identical to Case 1.

Baseline vitals prior to injection

Blood pressure 125/75 mmHg, heart rate 70 bpm, oxygen saturation 98%.

Post-injection complications

Forty minutes after the injection, the patient established headache, nausea, and vomiting. Neurological examination was normal.

Treatment

Intravenous furosemide 20 mg and hypertonic saline 3% administered at 5 mL/min. Symptoms resolved within five hours, and the patient was discharged without complications.

Discussion

Epidural steroid injection (ESI) is a well-established and effective method for managing radicular pain caused by spinal disorders and has been widely used in specialized clinics for many years [1-2]. However, a history of multiple lumbar surgeries can lead to significant anatomical alterations within the epidural space. This increases the technical difficulty of the procedure and elevates the risk of adverse events [5,6]. The formation of scar tissue and fibrotic adhesions reduces the available epidural volume and disrupts the normal distribution pathway of injectates. This disruption can facilitate unintended spread into the subarachnoid space, potentially resulting in neurological or systemic complications [9]. In elderly patients and those with a history of multiple spinal surgeries, post-epidural steroid injection (ESI) symptoms like headache, nausea, and vomiting may be explained by several mechanisms:

Inadvertent Subdural or Intrathecal Injection: In patients with post-surgical anatomical distortion, the risk of accidental needle placement into the subdural or intrathecal space is heightened. This can cause cerebrospinal fluid (CSF) leakage, leading to reduced CSF pressure and positional headache [3,6].

Transient Increase in Intracranial Pressure (ICP): The injection of a substantial fluid volume into a confined and scarred epidural space can cause a transient elevation in ICP. This pressure increase may irritate the meninges and trigger symptoms such as headache and nausea [7].

Local or Systemic Reaction to Injectable Agents: Although less frequent, hypersensitivity or inflammatory reactions to the corticosteroid or local anesthetic components can also produce similar symptomatology [10].

In the two cases presented, symptom onset occurred 40–45 minutes post-injection. Given the patients' surgical histories and the injection volume administered, inadvertent subdural/intrathecal spread or a significant ICP increase are considered highly probable etiologies. For such patients, prompt intervention to manage elevated ICP is crucial to prevent progression to more severe complications like altered consciousness or neurological deficit. In these instances, intravenous furosemide and 3% hypertonic saline were administered to reduce cerebral interstitial fluid volume and lower ICP. Combination therapy with these agents has been shown to be effective in managing elevated CSF pressure [7,11]. Hypertonic saline acts by establishing an osmotic gradient that draws fluid from the intracellular and interstitial compartments into the vasculature, while furosemide promotes diuresis, reducing total body fluid volume [12]. This conservative management strategy resulted in complete symptom resolution within hours for both patients, averting the need for more invasive procedures such as an epidural blood patch.

Therefore, it is imperative for anesthesiologists and neurosurgeons to meticulously evaluate the surgical history of patients prior to performing epidural injections, with a high index of suspicion for anatomical distortion and subsequent complication risk. Employing image-guidance techniques, such as fluoroscopy or ultrasound,

can enhance needle placement accuracy and potentially reduce the incidence of such adverse events [13,14].

In addition, reducing the volume and rate of drug injection is recommended in these patients. This report, given the advanced age of the patients and their history of spinal surgery, highlights the importance of preparedness for the prompt management of rare but potentially serious complications of epidural steroid injection. As there are limited case reports on this subject, documenting and publishing such cases can increase awareness and help refine treatment protocols.

Epidural steroid injection is a minimally invasive and effective approach for reducing radicular pain caused by spinal disorders. However, several complications—such as hypothalamic–pituitary–axis suppression, hyperglycemia, and immunosuppression—have been reported, albeit infrequently but with clinical relevance. Studies have shown that when injections are performed according to strict guidelines, whether by the transforaminal or interlaminar approach, the rates of both immediate and delayed complications are very low. Furthermore, analysis of outcomes in elderly patients suggests an increased risk of vertebral fractures associated with the procedure in this population, warranting cautious use. Overall, although epidural steroid injection can provide short-term benefits, its long-term safety in specific populations such as the elderly or obese requires more thorough evaluation. Rare but serious complications, including neurological injury or vertebral fracture, may occur more frequently in these groups compared with younger populations. Accordingly, it is recommended that the procedure be performed under imaging guidance, such as fluoroscopy or ultrasound; that in elderly patients or those at high risk, the injection volume and frequency be reduced; and that the potential benefits and risks be clearly explained to the patient.

Conclusion

Epidural injection in elderly patients with a history of multilevel spinal surgery should be performed with caution, under strict aseptic conditions and close monitoring. Prompt recognition of complication-related symptoms and timely intervention can lead to complete recovery without sequelae.

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