



Complications and safety of cervical interlaminar epidural block

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Cervical interlaminar epidural block (CIEB) can be effective for the treatment of neck or upper extremity pain [1]. It can also be effective in cervical post-surgery syndromes [2]. In Korea, this procedure is widely used for the treatment of pain. Although the frequency is low, cervical epidural blocks, including interlaminar and transforaminal epidural blocks, may cause several complications. These complications include neck pain, facial flushing, nausea, vomiting, transient hypotension, infection, respiratory insufficiency, subjective weakness in the arms, insomnia, dizziness, double vision, subdural block, dural puncture, headache, nerve injury, neuropathic pain, epidural hematoma, systemic toxicity of local anesthetics, syrinx formation, stroke, spinal cord/cerebellum/brainstem infarction, paralysis, or death [3–10].

There are published opinions on the safety of CIEBs. Recommendations include appropriate techniques, mandatory imaging guidance with multiple views, use of contrast media under real-time fluoroscopy or digital subtraction imaging, and performing the block at the C7-T1 spinal level (not higher than the C6-7 level) [2,11–14]. After these recommendations were published, Manchikanti and Falco [15] pointed out a lack of evidence for some recommendations. They mentioned that mandatory fluoroscopy was necessary for all procedures, but

multiple views were not. Many physicians use the loss-of-resistance (LOR) technique to confirm the epidural space. However, without C-arm fluoroscopy, 53% of the first LOR attempts resulted in inaccurate needle placement in the epidural space [16]. Therefore, C-arm fluoroscopy guidance is needed to ensure a safe and accurate CIEB. When performing CIEBs, physicians should not rely solely on the LOR technique for needle placement in the epidural space. At lower cervical levels, lateral views may be inappropriate for confirming the epidural space due to unclear images, while contralateral oblique views can be helpful for confirming needle placement in the epidural space and preventing dural puncture [17,18].

Manchikanti and Falco [15] did not agree with the approach at the C7-T1 level because the incidence of dural puncture at the C6-7 level and above was not higher than at the C7-T1 level. Many experienced pain physicians perform CIEBs at the C5-6 and C6-7 levels [15]. These levels are frequently associated with pathology and have minimal or similar complications compared with the C7-T1 level [6,15,19].

In a retrospective study of 12,168 CIEBs with particulate steroids, the complication rate was 1.1%, with only 0.06% encountering serious complications [6]. However, there were no cases of permanent disability, paralysis, or death,



and most of the complications were minor. Serious complications (7 cases) included increased blood pressure (3 cases) during and after the procedure, substernal chest pain (1 case), dural puncture (1 case) with intrathecal air, and spinal cord penetration with the needle (2 cases). Although they used particulate steroids, there were no infarctions or other complications related to particulate steroids. In Korea, particulate steroids have been prohibited during epidural blocks since 2016 [20].

Although CIEBs may cause some complications, their incidence is low and most complications are transient. Serious complications associated with CIEBs are very rare. For safe CIEBs, physicians should perform the procedure with care and use imaging guidance techniques, such as C-arm fluoroscopy with contrast media. During and after the procedure, the patient's condition should be carefully monitored for abnormalities.

DATA AVAILABILITY

Data sharing is not applicable to this article as no datasets were generated or analyzed for this paper.

CONFLICT OF INTEREST

Jae Hun Kim is a section editor of the Korean Journal of Pain; however, he has not been involved in the peer reviewer selection, evaluation, or decision process of this article. No other potential conflict of interest relevant to this article were reported.

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AUTHOR CONTRIBUTIONS

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