

# Allodynia-like Phenomena Associated With Spinal Anesthesia

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## Abstract

Allodynia-like phenomena after intrathecal injection of local anesthetics were observed in five patients who had no evidence of neurological disorder before anesthesia. Allodynia was defined as a pain due to a stimulus that does not normally provoke pain. The frequency of allodynia after spinal blockade was 5/390 cases in our experiences. Symptoms were alleviated by intravenous administration of subanaesthetic doses of diazepam but not of pentazocine.

## INTRODUCTION

In the context of a separate clinical study using Neopercamine-S(r) (80 patients), tetracaine (156 patients), and bupivacaine (154 patients), we measured dermatome levels of responses to pinprick, cold, and touch after intrathecal injection of local anesthetics in patients who had received either atropine sulfate alone as premedication or no premedication at all, i.e., no sedation.

Unexpectedly, we observed allodynia-like phenomena after intrathecal injection of these agents except bupivacaine in five patients who had no evidence of neurological disorder before anesthesia. Allodynia was defined as a pain due to a stimulus that does not normally provoke pain. Symptoms were alleviated by intravenous administration of subanaesthetic doses of diazepam but not of pentazocine.

## CASE 1

A 55-year-old woman (54 kg, 162 cm) was admitted for a total abdominal hysterectomy for myoma uteri. Premedication, namely, intramuscular atropine sulfate (0.5 mg) was given 30 min before she entered the operating room. For anesthesia, 2.5 ml of Neopercamine-S(r) [combination of 0.24% dibucaine with 0.12% p-

butylaminobenzol diethylaminoethanol-HCl, in a 9.5% solution of glucose as solvent] were slowly injected intrathecally. About 1 minute after the intrathecal

injection, the sensory level with respect to a pinprick (18-gauge needle) and cold stimulation, as assessed with an alcohol wipe, was T11 on both sides. In the course of a complete examination, we noted that light touching with the hand of the body surface below the thigh, corresponding to the L1 level, evoked marked reports of pain and visible signs of discomfort (facial distortion), namely, allodynia. Five minutes after intrathecal injection, the sensory blockade level with respect to a pinprick and cold stimulation was T6 on both sides.

Allodynia was observed at T10 and below. Intravenous administration of 5 mg of diazepam had no effect on the patient's alertness but immediately relieved the allodynia, and loss of touch sensation was registered at T10 and below. The operation was completed. Two hours after intrathecal injection, the sensory blockade level with respect to a pinprick and cold stimulation was T5 on both sides. Touch sensation recovered completely and no further allodynia occurred postoperatively.

### OTHER CASES

In four additional cases, patients developed similar symptoms, when we used the same anesthetic technique.

All five of these patients were in good general health (ASA physical status I), with a negative medical history. The skin on the back of each patient was normal with no bony deformities of the spine and no neurologic abnormalities. Disposable spinal trays, sterilized in ethylene oxide, were used for all five patients. Before lumbar puncture, the skin over the lumbar area was cleaned with a solution that contained 10% iodine. After removal of excess iodine solution, an uneventful lumbar puncture was performed without difficulty in the left lateral position with a 25-gauge needle at the L3-4 or L4-5 intervertebral space. After intrathecal injection, each patient was turned to the supine horizontal position. There was adequate surgical anesthesia for each entire procedure, with no intraoperative perception of pain. No allodynia was observed during offset of spinal anesthesia.

No patient showed evidence of emotional disturbance, such as crying easily or fear of surgery.

### DISCUSSION

In contrast to severe pain and allodynia that have been reported after spinal anesthesia in patients who have a neurological disorder [1,2,3,4,5,6,7], the absence of any neurologic abnormalities in the present cases, before and after anesthesia, appears to exclude the possibility of exaggeration of an existing disorder of the central or peripheral nervous system by the local anaesthetic agents.

There is no clear understanding of the mechanism of allodynia-like phenomena after spinal blockade. Trauma, spinal cord ischemia, infection, neurologic toxicity, or chemical contamination cannot readily explain the present cases.

We did not make precise measurements of the mean duration of allodynia after spinal anesthesia nor can we provide the results of different treatments employed to reduce the incidence and severity of this problem because of ethical limitations to such studies. In the absence of prolonged neurologic problems after spinal anesthesia in our patients, the clinical significance of this phenomenon remains inconclusive. However, to our knowledge, such allodynia has not

previously been reported. We hope that this set of case reports will stimulate research into the clinical picture of abnormal sensation after spinal anesthesia.

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