

52. THE EFFECTS OF NEEDLE TYPE, GAUGE, INSERTION DEPTH AND THE USE OF INTRODUCER NEEDLE ON SPINAL OR EPIDURAL NEEDLE DEFLECTION

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Background: It is wellknown that, during spinal anesthesia, beveled needle deflects more than pencil-point needle does, and that deflection is correlated with gauge and the depth of insertion (1-3). With the use of introducer needle, the deviation is reduced (3). Introducer needle, however, also has its own bevel, so it may have some effect on the deflection of spinal needle. To our knowledge, there has been no report about the deflection of spinal needle during the combined techniques.

This study was performed to know how far spinal needle deflects when it is inserted through introducer or epidural needles and to assess how the bevel direction of spinal and introducer needles affects deflection.

Methods: A styrofoam block of 2, 3, 4, and 5 cm-thickness was used to simulate the paraspinal area of the back. A line was drawn perpendicular to the edge. Using the line as a guide, the needles were advanced through the block. Quincke-type needles of 22 and 25 gauge, pencil-type needles of 22 and 25 gauge or Tuohy needles of 17 and 18 gauge were used. By using a block of 6 cm thickness, spinal needle was advanced through the introducer with their apertures facing to the same or opposite direction. The total deflection of combined spinal-epidural needle, namely, the deflection of spinal needle tip inserted through Tuohy needle was measured by using a 5 cm-thick block. The deflection from the perpendicular line was measured in mm intervals.

Results: Small-gauged and beveled spinal needles had more deflection depending on the block thickness ($P < 0.05$). However, the deflection of epidural needles was not consistent. When the bevel of the introducer and spinal needle was facing the same direction, the use of an introducer needle decreased the deflection in 22 and 25 G Quicke, and 25 G Whitacre needles ($P < 0.05$). When facing each other, the deflection was reduced in all the spinal needles ($P < 0.05$), and reduced more in the 25 G Quicke needles ($P < 0.05$).

Conclusions: Considering the estimated depth of the spinal canal, needle type, bevel direction, its gauge and the use of an introducer needle, we can take advantage of the deflection phenomenon to reduce post-dural puncture headache and to increase the success rate of a spinal or epidural block.

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