

Evaluation of echogenicity of needles used in continuous infusion regional techniques

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Introduction: Multiple studies have compared the echogenicity of different needles used in single shot regional anaesthesia, but no studies have looked at needles used for continuous infusion. In this study, needles designed for insertion of continuous infusion catheters were compared, and their echogenicity was analysed in two different media and at two angles. The hypothesis was that the five needles would not differ in echogenicity in animal tissue and in a Blue phantom (Advance Medical Technologies).

Methods: The five needles were visualised under ultrasound in standard settings on animal tissue and Blue phantom at 0 degree and 30 degree angles. The needle was visualised using the in-plane approach at a fixed depth. Optimal still images were obtained. These pictures were graded by five expert blind observers using a visual analogue scale (0-10). Visibility of the needle and distinction of the needle contrast to the surrounding area were evaluated.

Table 1: Details of continuous regional anaesthesia needles

Needle	Size
Pajunk Stimulong Plus Nanoline Tuohy	18 G
Pajunk StimuLong Plus Nanoline Facet	19 G
BBraun Contiplex Tuohy	18 G
BBraun Contiplex D	18 G
Portex Tuohy Epidural	18 G

Results: In Blue phantom, all needles had median visibility scores above 7 except for the BBraun Contiplex D ($p=0.0158$). Even though the median visibility score dropped at 30°, the difference between the needles was not statistically significant. The median contrast of the needles dropped from 0° to 30°. In the animal phantom, median visibility score was higher and it was more than 7 at 0° except for the BBraun Contiplex D ($p=0.0114$). At 30° the visibility score reached 7 only with Pajunk StimuLong Plus Nanoline Facet 19G ($p=0.0046$). Pajunk Stimulong Plus Nanoline Tuohy 18G and BBraun Contiplex D reached median contrast score above 7 with statistical significance ($p=0.0184$) at 0°. At 30° the median contrast score declined for all. Multivariate analysis of the data showed that the angle of insertion was an independent predictor of the needle visibility and the contrast to the surrounding tissue in both Blue and animal phantom.

Conclusions: Echogenicity decreases as the angle of insertion increases. Portex Tuohy Epidural 18G and BBraun Contiplex D showed less echogenicity than the other needles in both Blue and Animal phantoms.

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