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TITLE: A COMPARISON OF THE LATERAL DEVIATION OF THE ATRAUCAN, THE GERTIE MARX AND OTHER 26 GAUGE SPINAL NEEDLES

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INTRODUCTION: The advancement of bevelled spinal needles through the tissues of the back may cause their tips to deviate from the intended linear path. A bevelled spinal needle's tip may thus fail to reach the subarachnoid space necessitating another needle insertion or an alternate method of anesthesia. We evaluated the tendency of 3 types of bevelled and one type of pencil point 26 G. spinal needles to deviate laterally using an *in vitro* model.

METHODS: A device was constructed for fully advancing 26 gauge 3.5 in. long spinal needles perpendicularly through a stack of precisely aligned metal spacers. The spacers allow strips of 0.5 in. wide fiberglass strapping tape to be placed in the path of the needle at 42.5 mm and then every 4.4 mm from the top of the device. The strips of strapping tape were arranged in a parallel fashion, one below the other, and were used to simulate the predominately longitudinal alignment of the tissues of the back. Each spinal needle was then advanced through the strapping tape manually until fully inserted. The three types of 26 G. bevelled spinal needles studied were: (1) the Becton-Dickinson (BD) Quincke; (2) the Monoject

(Sherwood Medical) Diamond tip; and (3) the Atraucan (Braun Medical). In separate runs, new bevelled needles were inserted with their bevels either parallel or perpendicular to the strapping tape's fibers. The pencil point 26 G. Gertie Marx (International Medical) spinal needle was also investigated. The degree of lateral deviation of the spinal needles was determined by examining the spacers covered with strapping tape microscopically using a calibrated reticle.

RESULTS: Insertion of the Quincke and Diamond tip needles with their bevels parallel to the strapping tape's fibers result in progressive lateral deviations along the path of the needle in the direction opposite to the needles' openings of up to 2.3 and 5.7 mm respectively. The maximum deviation noted on parallel insertion of the Atraucan needle was 4.8 mm in the same direction as the needle's opening. When the Quincke and diamond point needles were inserted with their bevels perpendicular to the tape's fibers, the deviations were again progressive and in the direction opposite from the needles' openings, but the maxima were 3.9 and 2.8 mm respectively. The maximum deviation noted on perpendicular insertion of the Atraucan needle was 2.7 mm in the same direction as its opening. There was no deviation of the Gertie Marx needle.

DISCUSSION: We have determined that the degree and direction of lateral deviation in this *in vitro* model is needle design dependent. The Quincke and Diamond tip needles deviated in the direction opposite to their openings whereas the Atraucan needle deviated in the same direction as its opening. The pencil point Gertie Marx needle demonstrated no lateral deviation.