

A Cadaveric Study on the Spread of Adductor Canal Block Dye to the Knee Joint Following Total Knee Arthroplasty

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INTRODUCTION:

The adductor canal block is a widely used analgesic technique following total knee arthroplasty and is feasible to perform intraoperatively. However, the risk of contamination of the knee joint is unclear. This cadaveric study aimed to assess the distance between the endpoint of adductor canal block with different volumes of methylene blue dye and the knee joint space.

METHODS:

An ultrasound-guided adductor canal injection with 10 milliliters and 20 milliliters of methylene blue was administered to 8 fresh cadavers by an experienced anesthesiologist. The cadavers were dissected to observe and measure the extent of dye distribution. Additionally, the study evaluated the injections performed after the knee joint was opened for total knee arthroplasty in 3 cadavers.

RESULTS:

Before the knee joint was opened for total knee arthroplasty, the mean distances from the most distal spreading of methylene blue to the knee joint space were 73.49 ± 25.06 millimeters and 75.67 ± 25.13 millimeters for the 10 milliliters and 20 milliliters injections, respectively ($p=0.869$). The lengths of the saphenous nerve stained with dye in the canal were longer in the 20 milliliters group (189.06 ± 43.53 millimeters) than in the 10 milliliters group (136.04 ± 42.46 millimeters) ($p=0.033$). In the knee joint opened for the total knee arthroplasty model, the mean distances between the distal spread of methylene blue and the knee joint space were 124.42 ± 18.87 millimeters and 86.91 ± 12.33 millimeters for the 10 milliliters and 20 milliliters injections, respectively ($p=0.054$). The methylene blue dye did not spread into the knee joint space in both conditions, before and after the knees were opened.

DISCUSSION AND CONCLUSION:

The adductor canal block injections of 10 milliliters and 20 milliliters provide a safe margin to avoid contamination from the injection. However, the 20 milliliters volume could spread to within 10 centimeters of the knee joint cavity. Therefore, caution is recommended when conducting adductor canal block in patients, with attention to superior extension dissection.