Influence of Leg Position on The Depth and Sonographic Appearance of the Sciatic Nerve in Volunteers

Valerie Quah¹; Graham Hocking¹,²; Kevin Froehlich¹

¹. Sir Charles Gairdner Hospital, Perth, Australia
². School of Medicine, University of Notre Dame, Fremantle, Australia

Introduction: Body position affects the position of neural structures and this is of direct relevance to regional anaesthesia. For example, abduction of the arm moves the infra-clavicular brachial plexus, pulling it away from the thoracic wall, reducing the depth of puncture and the risk of pneumothorax. We have noticed this movement also makes the brachial plexus appear more echogenic. We investigated the effect of leg position on the depth of the sciatic nerve and quality of ultrasound images at the proximal and mid thigh level.

Method: Twenty-one volunteers of average build were imaged in the lateral position, with the hip flexed and with the hip in a neutral (straight) position by a single operator (GH). The best images of the sciatic nerve at the proximal and mid thigh level were saved and nerve depth was measured. Eleven clinicians experienced in ultrasound guided regional anesthesia reviewed the images as a PowerPoint presentation on a single computer under standard lighting conditions. After a standardised introduction, each clinician was shown the series of 21 paired images, at the proximal and mid thigh level. Paired images were displayed simultaneously, alongside each other on the screen. Clinicians were not told which of the two images was obtained with the hip flexed or in the neutral position. Placement of the flexed and neutral images on the screen was randomised for each pair. The clinician recorded whether the sciatic nerve was better visualised in one image compared to the other or if there was no difference. No time limit was imposed. A Wilcoxon signed-rank test was used to compare clinician visualisation of the images.

Results: In the proximal thigh, the sciatic nerve was deeper with the hip flexed (median 30mm) compared to the hip neutral (median 23mm) (p=0.0002). There was no consistent depth difference in the mid thigh. There was no difference in nerve visibility.

Conclusion: We suggest clinicians consider not flexing the hip when performing proximal thigh sciatic blocks. The nerve will be more superficial, and equally visible. However, given that the magnitude of the depth difference is small, patient positioning should still primarily be dictated by what makes performance of the nerve block the easiest.

Acknowledgement: We thank Dr W Weightman for his assistance with the statistics.