

Results for the Study: Biomechanics of Epidural Loss-of-Resistance: A Clinical Observational Study.

Introduction

This study took place at the Royal University Hospital between June 2013 and December 2016. If you participated in this study, we would again like to thank you, and share what we found.

Background

Epidurals are inserted with a syringe attached to a special needle. A particular injection technique (the “Loss of Resistance” technique) is used to find the exact spot to place the needle. This study was done to determine the force exerted on the syringe and the flow pattern of the fluid in the syringe by the anesthesiologist while finding that exact spot.

Results

We recruited and analyzed results from 16 participants (11 women and 5 men). Our study demonstrated 4 main findings. First, this technique of studying epidural biomechanics worked in a hospital setting, maintaining sterility without interfering with epidural insertion. Second, there was a lot of variability in the rates of injection, volume injected, and force applied to the plunger. Third, “Loss of Resistance” thrust during injection of saline was insufficient to push the tough outermost membrane of the spinal cord (dura) away from the needle end. Lastly, pressure dispersion time showed that the epidural space behaves as a poroelastic tissue (spongy tissue with a thick sticky fluid). Further study of its properties should lead to safer epidural insertion.

Conclusion

Health quality experts criticize a highly variable application of health-care measures to seemingly similar patients, reasoning that they cannot all be best practice. Further research into dynamic biomechanics may suggest an optimal “Loss of Resistance” volume and force.

If you have any questions, please feel to contact me.

Sincerely,

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