

## Ultrasound-guided Penile Nerve Block for Circumcision: Suggesting Lower Anesthetic

### Volume and Narcotic Use

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Circumcision is one of the most frequent surgical procedures for pediatric males. Dorsal penile nerve block(DPNB)<sup>1</sup> has been approved for this procedure<sup>2</sup> We describe a new, modified ultrasound-guided(UG)penile block technique in pediatric patients undergoing circumcision and compare this technique to patients who received landmark guided DPNB.

After administering general anesthesia, penis and surrounding area were prepped sterilely. Sterilized gel was used and ultrasound probe was covered with 4" sterile Tegaderm® film to ensure sterility. Holding the probe and positioning the needle against it can be problematic, but we found that 25 gauge, 1.5" regular needle was easy to position. We used linear ultrasound probe with frequency range of 5 to 10 MHz and adjusted ultrasound machine to musculoskeletal setting for better view. We placed the probe transversely along the base of penis with gentle traction of penis. After recognizing the anatomical structures, needle was advanced using the in-plane technique under real-time ultrasound guidance until loss of resistance was felt when needle passed through the hyperechoic superficial lining of Buck's fascia. Immediately after passing through this layer, needle tip was positioned lateral to dorsal artery into the substance of Buck's fascia. After negative aspiration, we injected 1-2 ml of plain 0.25% bupivacaine under direct vision.<sup>3</sup> The same procedure was performed on the other side. We placed a small ventral bleb with local anesthetic at the penoscrotal junction to block the scrotal branches of the pudendal nerve.<sup>4</sup>

Analyses were conducted using R version 3.0.2 (Vienna, Austria: R Development Core Team). Wilcoxon rank sum test and Fisher's exact test were applied.

Comparisons of both groups showed significant difference in bupivacaine and total intra-operative opioids usage (p-values <0.001 and 0.001). The UG group used significantly less bupivacaine, 4 mls less in the median and 0.14 mg/kg less total intra-operative opioids in the median than the DPNB group. No significant difference of post-operative opioid and baseline variables were found. The DPNB group was approximately 1.8 times more likely to require rescue medication and approximately 2.14 times more likely to have a complication than the UG group. Among the patients who required rescue medication, we found the UG group took the rescue medication 21.5 minutes in median later than the DPNB group. This difference is statistically significant (p-value=0.014), indicating the UG group had a more lasting effect than the DPNB group.

Ultrasound allows three-dimensional anatomy allowing needle placement directly into the subpubic space, thus avoiding possible complications. Our use of placing needle close to the nerves appears to be a reliable technique that minimizes adverse events, thus supporting the existing studies.<sup>5,6</sup>

We recommend the ultrasound technique to improve clinical outcome for patients undergoing circumcision.

## References

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