Superficial Parasternal Intercostal Plane Block for Post Sternotomy Pain in Pediatrics: A Case Report

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Background and Objective

Pain control after cardiac surgery involving median sternotomy is a major concern for pediatric patients [1]. Although the literature has several references to anterior truncal blocks in adults for the control of post sternotomy pain [2], there is a paucity of such procedures in the pediatric literature [3]. Our case presents the use of a superficial parasternal intercostal plane block (SPIP) in a pediatric patient undergoing cardiac surgery with median sternotomy.

Methods

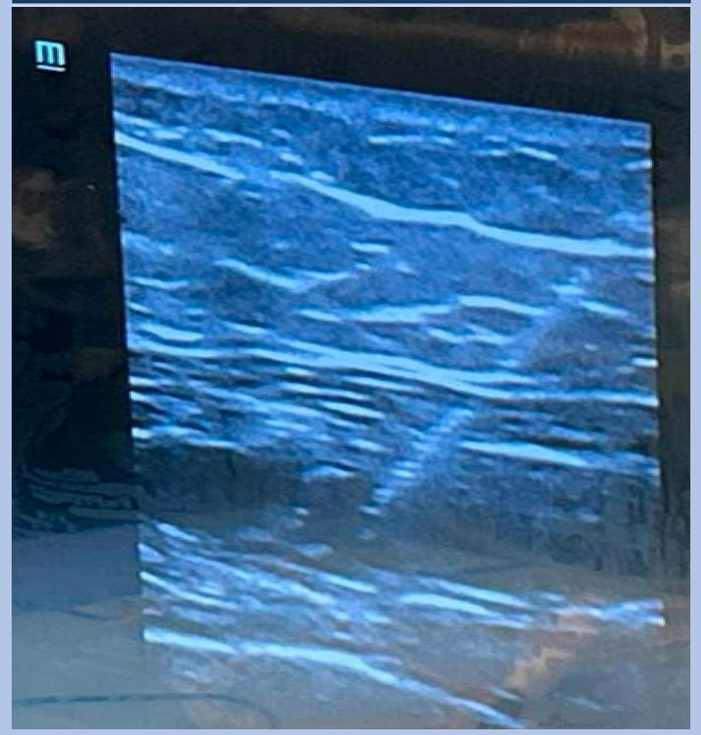
Parent/guardian informed consent was obtained through verbal discussion for both the procedure and the submission of this case presentation. This is a case presentation and IRB approval is not required.

Case Description

A 12 year old male weighing 85.5kg presented for **resection of subaortic membrane via redo sternotomy and cardiopulmonary bypass.**

The case was done under **general anesthesia**. The patient received a total of **6mg of midazolam, 950mcg of fentanyl as a bolus and infusion, and 0.8mg of hydromorphone** during the case.

Figure 1. Ultrasound Image of SPIP Block



References

[1] Mazzeffi M, Khelemsky Y. Poststernotomy pain: a clinical review. *J Cardiothorac Vasc Anesth*. 2011;25(6):1163–1178. doi: 10.1053/j.jvca.2011.08.001

[2] Chen T, Vargas Galvan LA, Walsh KL, Winegarner A, Apruzzese P, Asher S, Maslow A. A Retrospective Review of the Deep Parasternal Intercostal Plane Block in Patients Undergoing Cardiac Surgery with Median Sternotomy. J Clin Med. 2025 Mar 18;14(6):2074. doi: 10.3390/jcm14062074. PMID: 40142882; PMCID: PMC11942828.

[3] Ohliger S, Harb A, Al-Haddadin C, Bennett DP, Frazee T, Hoffmann C. Addition of Deep Parasternal Plane Block to Enhanced Recovery Protocol for Pediatric Cardiac Surgery. Local Reg Anesth. 2023 Feb 16;16:11-18. doi: 10.2147/LRA.S387631. PMID: 36814520; PMCID: PMC9940490.

Regional Anesthetic and Results

At the end of the case, the block was performed using ultrasound guidance and full sterile technique. The probe was placed in the **sagittal orientation lateral to the sternum at the T4 rib space** and the superficial parasternal intercostal plane was identified. Using a 21 gauge 5cm echogenic needle, **20cc of 0.25% bupivacaine with 20mcg of dexmedetomidine was injected between the pectoralis major and internal intercostal muscles bilaterally** without complications (Figure 1).

The patient was extubated and transported to the ICU.

Post-operatively the patient received IV acetaminophen 1000mg every 6 hours and was ordered for a hydromorphone PCA with a demand dose of 0.14mg every 10 minutes. **Throughout post op day zero the patient rated his pain between a one and a three, using the PCA overnight to administer a total of 2.25mg of hydromorphone between 8pm and 8am, without requiring any clinician boluses.**

Discussion

The SPIP block used in this case report was easy to perform, did not require any change of patient position, was able to be completed in a timely manner, and resulted in good multimodal postoperative analgesia. Although this is only one case report, it demonstrates a valuable regional anesthetic technique currently underutilized in the pediatric population, and is an area that should continue to be explored.