

REGIONAL ANESTHESIA FOR POSTOPERATIVE PAIN MANAGEMENT IN ADULTS WITH CONGENITAL HEART DISEASE UNDERGOING CARDIAC SURGERY: *A CASE SERIES*

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Background and aim:

Adults with congenital heart disease (ACHD) undergoing cardiac surgery present unique anesthetic challenges. While regional anesthesia reduces time to extubation and hospital length of stay (LOS) in pediatric congenital heart surgery (1), similar literature in ACHD is limited. This case series describes individualized regional anesthesia strategies in five ACHD undergoing epicardial pacemaker insertion or exchange.

Methods:

Regional anesthesia for each patient was tailored to surgical plan and incision pattern with the various combinations described in the following table.

Case	Surgery	Block
1	Pacemaker generator exchange via sternotomy	Left T5–9 intercostal blocks Right PIFB
2	Pacemaker insertion via subxiphoid converted to sternotomy	Bilateral T6–7 & Left T8–9 PVB Bilateral PIFB
3	Pacemaker insertion via redo sternotomy Thoracotomy + VAC closure	Bilateral PIFB catheters Left T3–7 intercostal cryoneurolysis
4	Pacemaker insertion via subxiphoid incision	Bilateral T6-7 & Left T8-9 PVB
5	Insertion new atrial epicardial lead via left thoracotomy Pacemaker replacement & generator exchange via subxiphoid incision	Left T4-8 intercostal blocks & cryoneurolysis

PIFB: Pecto-Intercostal Fascial Block PVB: Paravertebral Block

Results:

Time to Extubation: 3 of 5 patients were extubated in the OR and the remaining 2 were extubated within 6 and 8 hours post-op

Pain: Minimal to no incisional pain on postoperative day 0 and 1

- Pain more noticeable at chest tube insertion site than at surgical incision
- All patients reported improved analgesia compared to previous similar surgeries

Opioid use: None to minimal in first 24 hours

Length of Stay: 2–20 days (unrelated to pain)

Cryoneurolysis: The two patients who received intercostal cryoneurolysis experienced prolonged analgesia at the incision site with no reported neuropathic symptoms during their hospital stay.

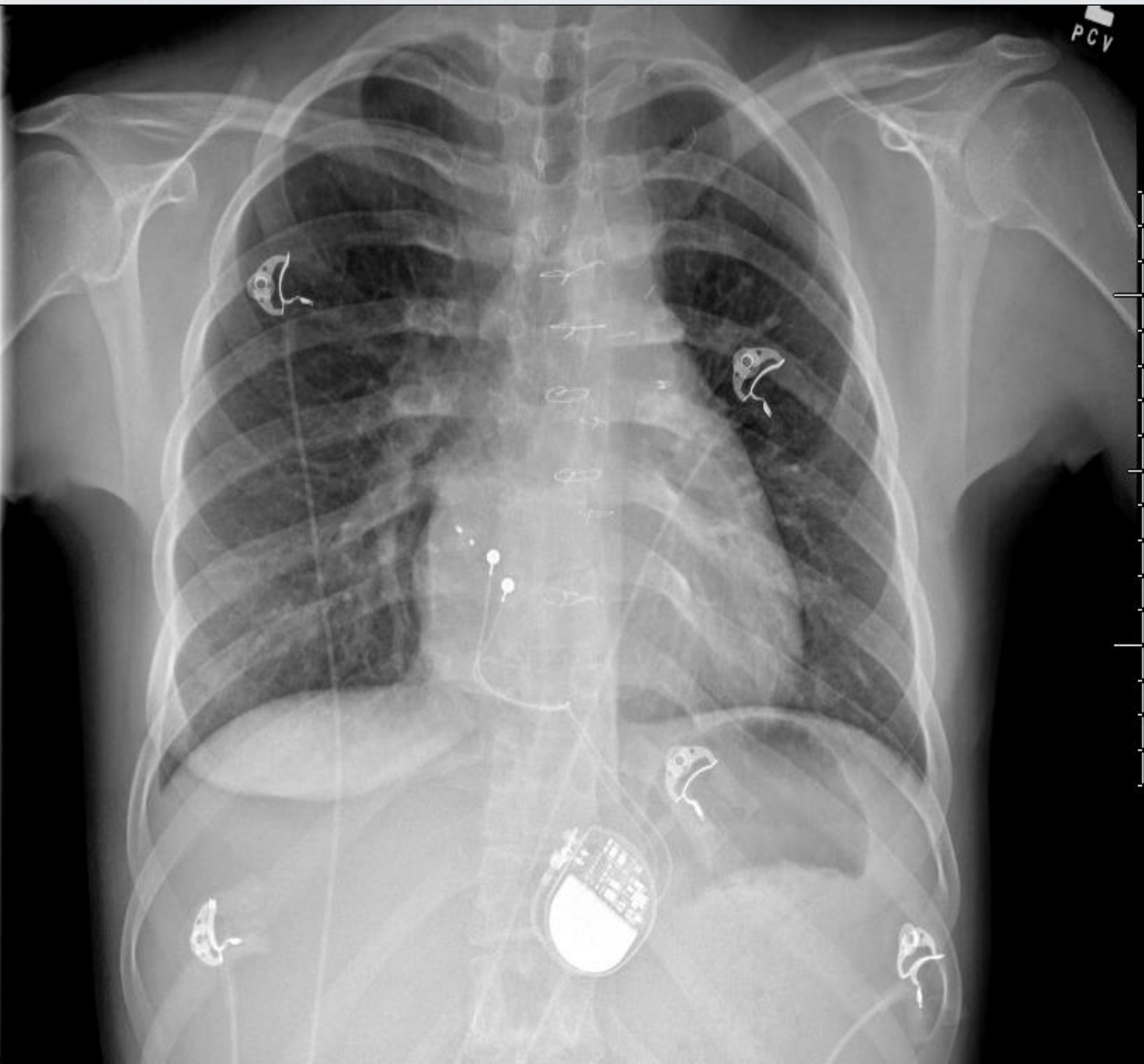


Figure 1. Chest radiograph showing position of subrectus epicardial pacing system. De-identified and used with patient permission.

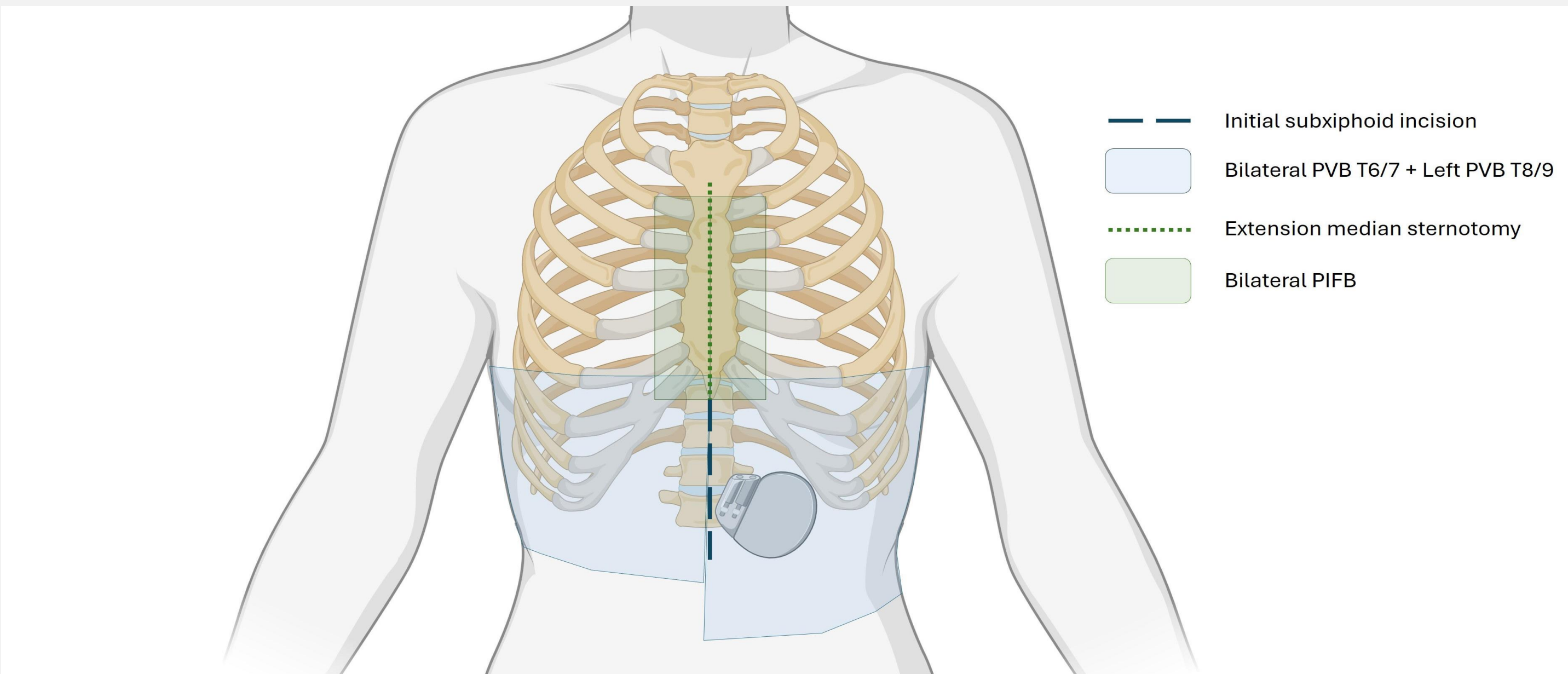


Figure 2. Schematic of Case 2 with dashed lines indicating the incision and transparent boxes representing dermatomal coverage from each block. Created with BioRender.com

Conclusions:

Regional anesthesia proved to be both effective and safe for managing postoperative pain in ACHD undergoing major cardiac interventions. It facilitated early extubation and reduced reliance on opioids, even in cases involving sternotomy or thoracotomy. These findings highlight the strong potential of tailored regional techniques to enhance recovery in ACHD undergoing cardiac surgery. Continued research is essential to optimize these approaches for this growing, high-risk population.

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References: 1. Yamamoto T. Regional anesthesia as part of enhanced recovery strategies in pediatric cardiac surgery. J Anesth. 2022;36(4):498-507. Available from: <https://pmc.ncbi.nlm.nih.gov/articles/PMC10155682/>