

Erector Spinae Plane Block for Pectus Deformity Surgery

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Introduction

Concerns over the risks of thoracic epidural in patients undergoing correction of pectus deformities have led institutions to search for pain control alternatives.

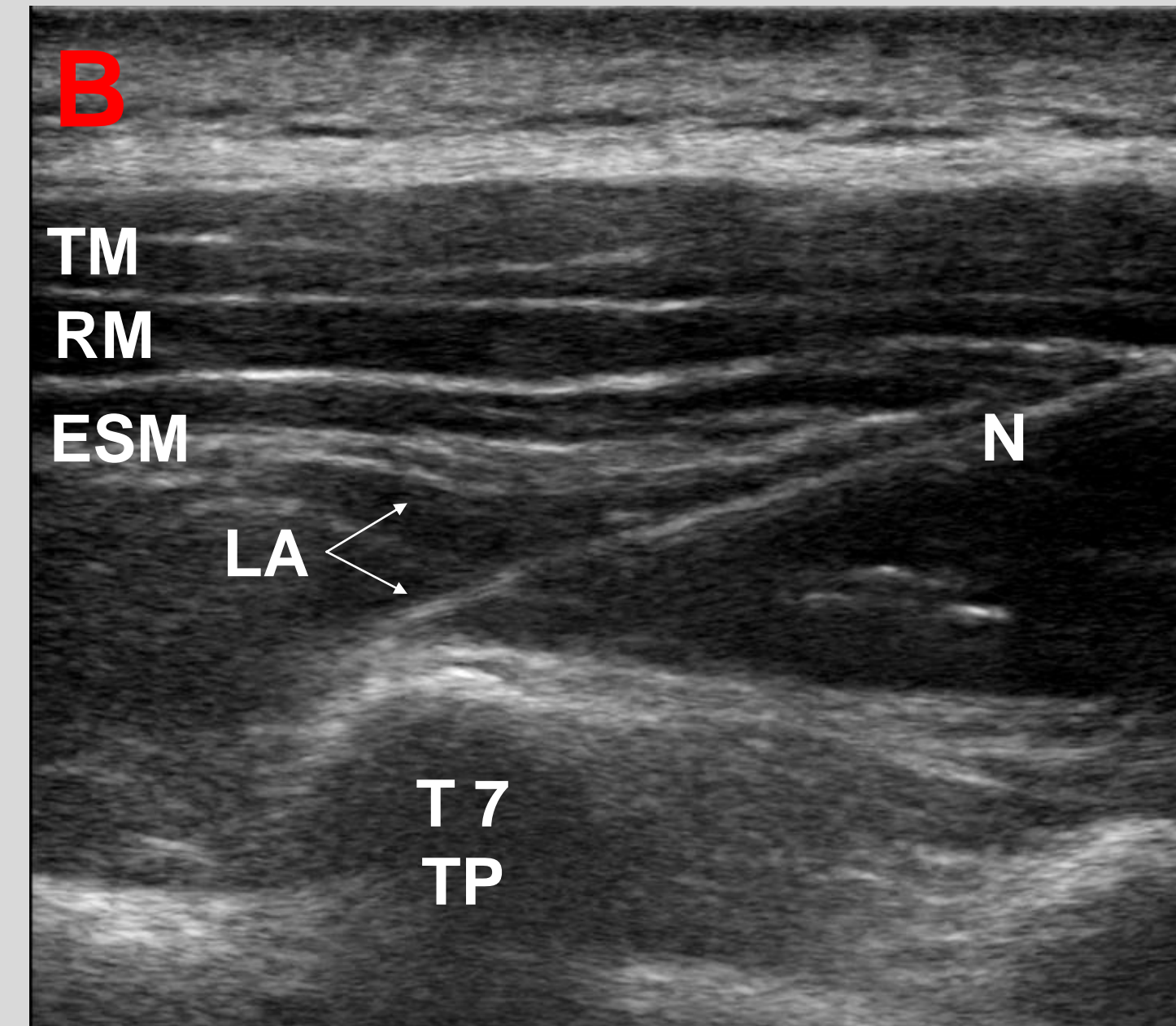
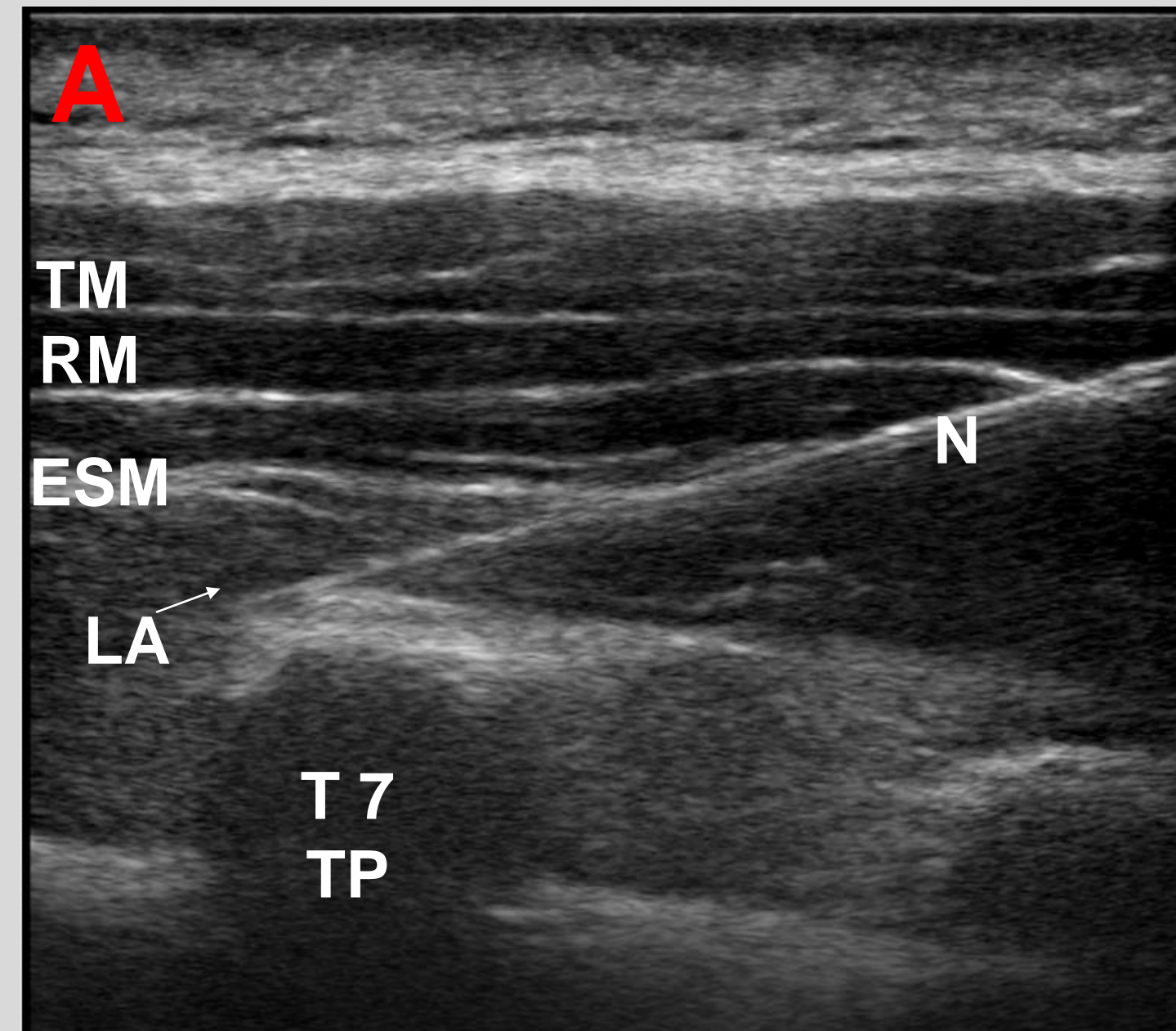
The erector spinae plane (ESP) block is an ultrasound-guided technique involving injection of local anesthetic in a fascial plane deep to the erector spinae muscle. It does not enter the neuraxial space, and is technically easier to perform with potentially greater caudocranial spread than a paravertebral block, making it a promising option for postoperative pain control. Here, we describe our early experience with this block.

Methods

A retrospective chart review was conducted identifying 10 pediatric patients who received bilateral single-shot ESP block for pectus deformity correction. Blocks were performed in left lateral decubitus position using a Sonosite L38 high-frequency linear probe and a 10 cm, 21-gauge echogenic block needle. We collected data regarding block placement, dosing, hemodynamic response to incision, and post-operative pain scores and opioid consumption

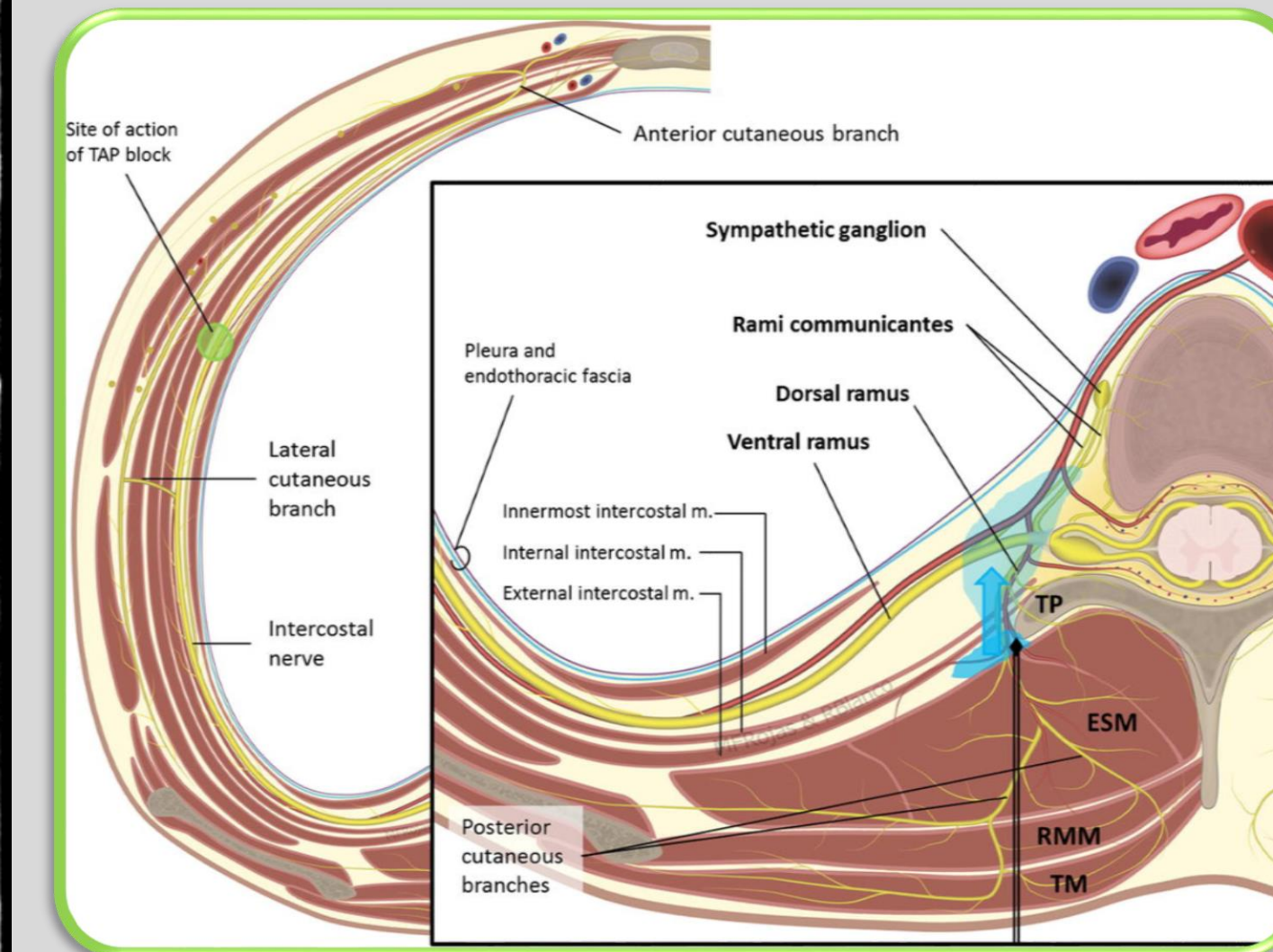
Results

- Average block time was 9 +/- 3.1 min,
- Block volumes ranged from 8-15 mL per side
- Average intraoperative fentanyl use was 1.2 mcg/kg
- 3 of 10 patients had an increase in heart rate and blood pressure >10% with incision.
- Postoperatively, all patients were managed with continuous wound infiltration and patient-controlled opioid analgesics.



ESM – Erector spinae muscle; RM – Rhomboid muscle; TM – Trapezius Muscle
TP – Transverse Process; N – Needle; LA – local anesthetic
A – Pre injection; B - Post injection: Notice lifting of ESM off of TP

Age (yr)	Wt (kg)	Level	Dose (mL/side)	Local Anesthetic	Block Time (min)	Intra-op Opioid	HR/BP Increase >10%	Time to First Opioid (min)	NRS PACU	NRS Max
17	71.0	T7	10	0.5% Bupi+Epi	8	Fentanyl 200 mcg	Y	25	5	5
19	68.0	T7	10	0.5% Bupi+Epi	8	Fentanyl 50 mcg	N	21	5	5
12	39.3	T7	8	0.5% Bupi+Epi	6	Fentanyl 75 mcg	N	22	3	10
13	59.8	T7	15	0.5% Bupi+Epi + 0.5% Ropi 2:1	7	Fentanyl 50 mcg, Alfentanil 400 mcg	N	45	5	10
15	60.4	T7	15	0.5% Bupi+Epi + 0.5% Ropi 2:1	6	Alfentanil 600 mcg	Y	37	7	8
15	54.2	T6	15	0.375% Bupi+Epi	6	Fentanyl 150 mcg	N	70	0	9
14	50.5	T7	15	0.5% Bupi+Epi	13	Alfentanil 1000 mcg	Y	45	0	10
17	62.8	T7	15	0.5% Bupi+ Epi	10	Fentanyl 50 mcg	N	14	5	5
17	58.2	T7	15	0.5% Bupi+Epi	14	Fentanyl 100 mcg, Morphine 4 mg	N	17	8	8
16	68.0	T7	15	0.5% Bupi+Epi + 0.5% Ropi 2:1	12	Alfentanil 1000 mcg	N	41	8	8
			13.3 ± 2.8 mL/side			9 ± 3.1 min		33.7 ± 17.3	4.6 ± 2.9	7.8 ± 2.1



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Conclusions

Single-shot ESP block is simple and quick to perform. Minimal hemodynamic response to incision and low intraoperative opioid consumption suggest that it is effective for pectus surgery. Patients had moderate-to-high postoperative pain scores and significant opioid requirement, suggesting that a single-shot block is of insufficient duration for postoperative analgesia.

As our current practice is to use continuous wound infiltration of local anesthetic, we have not yet evaluated continuous ESP catheters. Further research is needed to evaluate its efficacy for postoperative pain control compared to the use of continuous wound infiltration