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Comparison of Post-operative Pain Control Modalities for Pectus Excavatum Repair

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Comparison of Post-Operative Pain Control Modalities for Pectus Excavatum Repair

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IRB Number: 17080489

Describe role of Submitting/Presenting Trainee in this project (limit 150 words):
Pediatric Surgical Scholar (research fellow in department of surgery) and primary author

Background, Objectives/Goal, Methods/Design, Results, Conclusions limited to 500 words

Background:

Postoperative pain following bar placement pectus excavatum is the dominant factor in the post-operative course and determines the length of stay. We previously conducted a randomized trial showing minimal differences between epidural and patient-controlled analgesia (PCA). We recently concluded enrollment of a second, 2-center trial of epidural versus PCA with more robust protocols for both. In this study, we compared the outcomes of cryoablation to our recent results with epidural and PCA protocols.

Objectives/Goal:

To compare outcomes of cryoablation with epidural and PCA for post-operative pain control in pectus excavatum repair.

Methods/Design:

We conducted a prospective observational study with a perioperative pain control protocol using intercostal cryoablation for patients undergoing bar placement for pectus excavatum. Results are reported here and compared with those of a recently concluded trial comparing epidural analgesia with PCA. Comparison of medians was performed using Kruskal-Wallis H tests with alpha 0.05.

Results:

There were 35 consecutive patients treated with cryoablation compared to 32 epidural and 33 PCA patients from the trial. There was no difference in gender, height, or weight (Table). Subjects

receiving cryoablation were older and had a higher correction index. Operating time was longer with cryoablation (median 101 min, versus 58 and 57 min for epidural and PCA groups, $p < 0.01$). Cryoablation resulted in far less time to pain control with oral medication and a dramatic decrease in length of stay (LOS) where most patients are discharged on post-operative day 1. We have encountered no patient with post-operative neuralgia.

	Epidural (n=32)	PCA (n=33)	Cryoablation (n=35)	p-value
Gender, Male (%)	90.6	93.9	82.4	0.20
Age (years, median [IQR])	15 [14,16]	14 [13,16]	16 [14,17]	0.02*
Height (meters, median [IQR])	1.8 [1.7,1.8]	1.7 [1.7,1.8]	1.7 [1.7,1.8]	0.46
Weight (kg, median [IQR])	56.6 [52,61.6]	56.1 [48,58.4]	57.1 [50,64]	0.24
Correction Index (% , median [IQR])	30 [27,30]	30 [30,40]	35 [30,47]	0.01*
Time to only oral pain meds (hours, median [IQR])	71.1 [50.4,82.7]	66.6 [50,70]	20.9 [11.6,28.4]	<0.01*
Length of stay (days, median [IQR])	4.3 [4.1,5.1]	4.2 [3.4,5.2]	1 [1,1.3]	<0.01*

Conclusions:

Intercostal cryoablation during minimally invasive pectus excavatum repair significantly reduces length of stay and time to oral pain medication alone compared with both epidural and patient-controlled analgesia.