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Minimally Invasive Repair of Pectus Excavatum Without Stabilizers Does Not Result in Increased Bar Displacement or Other Post-operative Complications

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The background features a white central area with watercolor-style illustrations of clouds in shades of light blue and cyan. A bright yellow sun with orange rays is positioned in the top right corner. The entire scene is framed by a colorful border with purple, blue, and orange tones.

INTRODUCTION

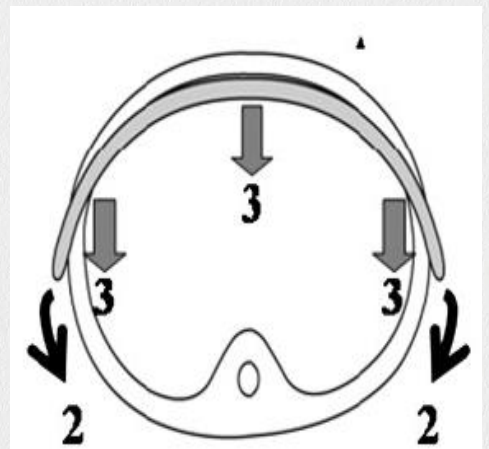
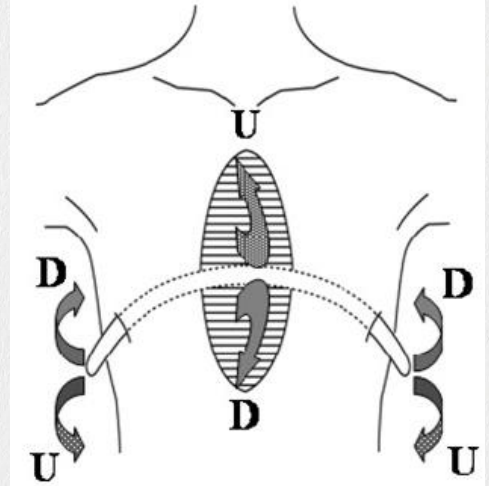
Background

- Surgeons have adopted various modifications to optimize patient outcomes and minimize complications following pectus excavatum repair
- Bar dislocation is a dreaded complication
- Surgeons often secure bars using stabilizers
 - Dislocation rates range from 2-4%
- Foreign material can be associated with increased morbidity



Types of Bar Dislocations

- Bar Flipping: rotation of the bar along the axis of hinge
- Lateral sliding: horizontal slipping of the bar to one side laterally
- Hinge-Point Disruption: dorsal shift of the bar
- Multi-point bar fixation
- Stabilizer use
- Lateral fixation site reinforcement



The background features a white textured surface with three light blue watercolor clouds: one in the top left, one in the bottom left, and one in the bottom right. In the top right corner, there is a yellow sun with several orange and yellow rays. The entire scene is framed by a colorful border with shades of purple, pink, and blue.

AIM

Evaluate patient outcomes, primarily bar displacement, in patients who undergo Minimally Invasive Repair of Pectus Excavatum (MIRPE) without stabilizer use.

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METHODS

Methods

- Single-institution, retrospective review of patients undergoing MIRPE without stabilizer use
- Timeline: 2020 to present
- Primary Outcome: bar displacement
- Secondary Outcomes: post-operative infection, post-operative analgesia, post-operative length of stay
- Demographics were recorded, as well as Haller index and corrective index

Surgical Fixation Technique

Two-point Tevdek



&

Vicryl Fixation



or

FiberWire



CMH Pectus Standard of Care

- All patients undergo minimally invasive repair with use of cryoablation intra-operatively
- Aim for a same day discharge
- Post-op analgesia is standardized and includes OTCs, muscle relaxants, and set number of opioids
- Post-op activity restrictions:
 - 20-pound weightlifting restriction for one month post-op
 - no additional activity restrictions to follow
- Patients are scheduled for outpatient follow-up within the month after surgery, then at three years



RESULTS

Results

Outcome Measures	
N	34 29 males (85%), 5 females (15%)
Age (months)	16 (14, 17)
Haller Index	3.9 (3.5, 4.6)
Corrective Index	26 (21.3, 41)
Post-op Length of Stay	1 (0, 1)
Days Opioid Use Post-op	5 (3, 7)

All values are reported as medians with interquartile range (IQR)

Results

- Displacement:
 - **Zero patients have experienced post-operative bar displacement or dislodgement**
 - No patients have required early bar removal
- Post-op Infection: two patients
 1. Left chest erythema, managed with oral antibiotics and supportive care
 2. Bilateral surgical site infection and dehiscence; managed conservatively with supportive care and oral antibiotics
- Readmission:
 - Short-term readmission immediately post-operatively for pain control

The background features a white textured surface with watercolor-style illustrations. In the top left, there is a light blue cloud. In the top right, a yellow sun with orange rays is partially visible. In the bottom left, there is a light blue cloud. In the bottom right, there is a light blue cloud. The word "CONCLUSION" is centered in a bold, orange, sans-serif font.

CONCLUSION

Conclusion

- Pectus bar placement without stabilizer use can be a safe means of correcting pectus excavatum without increased risk of bar displacement
- Minimizing semi-permanent surgical hardware can mitigate post-operative morbidity such as infection, irritation, and pain
- Future Directions:
 - Compare cohort outcomes to controls: patients undergoing MIRPE *with* stabilizer use
 - As patients begin to undergo bar removal, examine intra- and post-operative findings

References

For more information on this subject, see the following publications:

H.J. Park, W.J. Chung, I.S. Lee, K.T. Kim. Mechanism of bar displacement and corresponding bar fixation techniques in minimally invasive repair of pectus excavatum. *J Pediatr Surg*, 43 (2008), pp. 74-78.

N. Cruz-Centeno, J.A. Fraser, S. Stewart, D.R. Marlor, T.A. Oyetunji, S.D. St. Peter. Determining the optimal technique for bar fixation in the repair of pectus excavatum. *J Lap & Adv Surg Tech*, 34:4 (2024), pp. 368-370.

M.L. Teddel, J.R. Milanez de Camposl, J. Das-Neves-Pereira, F.C. Abrãol, F.B. JateneI
The search for stability: bar displacement in three series of pectus excavatum patients treated with the Nuss technique. *Clin Sci*, 66 (2011), pp. 1743-1746.

A watercolor-style background with a rainbow gradient. The colors transition from deep purple on the left, through magenta, pink, yellow, and green, to a vibrant blue on the right. The texture is soft and painterly, with visible brushstrokes and color blending.

THANK YOU