The Utility of Echocardiography and Pulmonary Function Testing in the Preoperative Management of Patients with Pectus Excavatum

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BACKGROUND
- Repair of pectus excavatum (PE) is typically based on the severity of deformity, cardiopulmonary abnormalities, & psychological impact.
- Preop evaluation usually consists of echocardiography (ECHO) & pulmonary function testing (PFT).
- ECHO & PFT results may not impact decision for surgery

RESULTS
- 64% Symptomatic
- 13% Abnormal ECHO
- 17% Abnormal PFT

- 12/14 Abnormal ECHO required cardiology follow-up
- None influenced surgical decision-making

<table>
<thead>
<tr>
<th>Abnormal PFT</th>
<th>Abnormal ECHO</th>
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<tbody>
<tr>
<td>Odds Ratio (95% CI)</td>
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<tr>
<td>Haller Index</td>
<td>1.81 (0.94-3.59)</td>
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<td>Correction Index</td>
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-Higher probability of abnormal PFT results if CI ≥ 42 or HI ≥ 4.5

CONCLUSIONS
- Prevalence of abnormal ECHO and PFT in patients undergoing Nuss procedure is low & does not correlate with symptoms.
- Increasing pectus severity is associated with higher likelihood of abnormal results.
- Routine ECHO is indicated to screen for cardiac anomalies requiring follow-up.
- Routine PFT is not indicated.

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Table 1. Multivariate Analysis of Pectus Severity & Cardiopulmonary Results
Repair of pectus excavatum (PE) is typically based on the severity of deformity, cardiopulmonary abnormalities, & psychological impact.

Preop evaluation usually consists of echocardiography (ECHO) & pulmonary function testing (PFT).

ECHO & PFT results may not impact decision for surgery.

Data: Symptoms, Pre-operative studies, CT Scan: Haller & Correction Index

Statistics: Multivariate logistic regression

Haller Index: $B/A = 3.4$

Correction Index: \((C-A)/C \times 100 = 31.7\%\)

Figure 2. HI & CI Assessment
**RESULTS**

- **64% Symptomatic**
  - (No correlation with abnormal tests)
  - **N=116**
  - 36% Symptomatic
  - 64% Asymptomatic

- **13% Abnormal ECHO**
  - **N=111**
  - 4% Normal
  - 2% MV Prolapse
  - 3% Dilated AR
  - 2% Bicuspid AV + Dilated AR
  - 4% Other
  - 87%

- **17% Abnormal PFT**
  - **N=90**
  - 2% Normal
  - 10% Obstructive
  - 5% Restrictive
  - 83%

- 12/14 Abnormal ECHO required cardiology follow-up
- None influenced surgical decision-making
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