Roundtable Presentation
Pectus Excavatum

Pectus Excavatum – Anatomy
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Disclosure Information
There were no financial interests or Relationships or conflicts of interest to disclose for any of the Pectus Excavatum Roundtable Moderators.
Objectives

- The learner will be able to:
  - Identify the anatomical abnormalities of pectus excavatum chest deformity.
  - Describe pectus excavatum clinical symptomatology.
  - Discuss post discharge management of children who have undergone surgical correction of a chest wall deformity.
  - List three elements essential to pectus excavatum discharge teaching.

Pectus Excavatum - Anatomy

- Irregular growth of the connective tissue (cartilage) that joins the ribs to the breastbone (also known as the costochondral region) causing inward defect of the sternum.
- Depression of the anterior chest wall, sternum and lower costal cartilages.

Chest Wall Deformities

**Pectus Excavatum**

**Pectus Carinatum**
Pectus Excavatum - Anatomy

- Pectus Excavatum accounts for approximately 90% of congenital chest wall deformities.
- Congenital – frequently noted at birth becoming more pronounced in early adolescence.
- Occurs in 1 of every 300-400 caucasian male births.
- More frequently in males M:F 3:1
- Approximately 40% of pectus excavatum patients have one or more family members with the same defect.

While the majority of pectus excavatum cases are not associated with any other conditions, some disorders can be associated with pectus excavatum, including:

- Marfan syndrome: A connective tissue disorder
- Rickets: a deficiency disease occurring primarily in children disturbing normal bone growth
- Scoliosis: more common association in females

- Pectus excavatum can cause compression of the heart and lungs.
- Varying degrees of severity
- Severe defects can force the heart into the left chest.
- CT scan without contrast – Haller index > 3.25.
Pectus Excavatum - Anatomy

Symptoms of Pectus Excavatum

• The severity of symptoms varies between patients and may include any of the following:
  • Fatigue
  • Shortness of breath
  • Chest pain
  • Tachycardia – arrhythmias
  • Pectus posture
  • Poor self image

Pectus Excavatum - Pre-Operative
Carmen R. Duque, MSN, CPNP
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Pre-Operative Process

• Initial evaluation with surgeon
  • Complete history and physical
• Testing
  • CT Scan
  • Pulmonary Function Tests
  • Cardiac Evaluation
  • Other
Pre-Operative Process

- Selection Criteria
  - Haller Index greater than 3.25
  - Cardiac or pulmonary compromise
  - Deformity progression

- Team Approach and Roles
  - Surgery Team
  - Nursing Team
  - Anesthesiologist/Pain Team
  - Physical Therapist
  - Child Life Therapist
  - Respiratory Therapist

What To Expect

- Pre-operative process – Day of procedure
- Anesthesia
- Pain management – Medications, PCA
- Oxygen, monitors
- Incentive spirometer
- Activity restrictions
- Pre-operatively, post-operatively, at home
- Follow-up – Discharge instructions

Pectus Excavatum – Intraoperative Care
Laura Koehler, MS, APNP
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Operative Technique

- Types of Pectus Excavatum Repair:
  - Nuss-Minimally Invasive Repair
    - Placement of stainless steel bar behind sternum, pushing sternum outward
    - +/- thoracoscopic visualization or digital palpation of the heart
  - Ravitch-Open Repair
    - Subperichondrial resection of the costal cartilages
    - Sternal osteotomy with retrosternal strut placement

Peri-Operative Complications

- Pneumothorax
- Hemothorax
- Pericarditis
- Pneumonia
- Wound/bar infection
- Bar displacement

Peri-op Nursing Considerations

- Prepping the patient
- Communicating with the family
- Reducing and recognizing complications through intra-operative care
- Hand off communication to the PACU staff
Postoperative Inpatient Care

- Usual Post-Operative Care
  - Pain Control
  - Mobility
  - Postoperative catheter routine

- Nursing Care
  - Handoff: What does this entail
  - Careplans: What is essential for the pectus excavatum patient
  - Nursing Centered Goals: How are these derived

Postoperative Inpatient Care

- Postoperative Teaching and Discharge Planning
  - What is included in discharge education
  - When does teaching begin
  - How is education completed and verified
  - How do parents receive information
Chest Wall Deformities

- Type of repairs
  - Ravich
  - Pectus bar
  - 3 MP Magnetic implant
- 2 week follow up then PRN
  - Pain management/pain clinic referral
  - Drain removal
  - Chest x-rays/chest protector PRN

Chest Wall Deformities

- Post operative guidelines
  - Pectus Bar – no contact sports > 6-12 months
  - Ravich – chest protector with sports > 6 months
  - Medical bracelet/dog tag – CPR/defib instructions
  - Magnetic Mini Mover Clinical trial
    - 24 months of therapy
    - No MRI
Chest Wall Deformities

- Post operative problems
  - Seroma
  - Wound infection
  - Trauma or bar shifting
- Long term follow up
  - Annual visit with CXR
  - Length of treatment 2 – 3 years
  - Strut removal for Ravitch