

Patient Care > Pectus Excavatum

Definition:

Pectus excavatum is the most common (90%) chest-wall deformity caused by depression of the sternum and anterior chest. The severity of the depression ranges from mild to severe. The deformity is sometimes referred to as sunken or funnel chest and may appear as though someone has been punched in the chest. Due to the chest depression, the abdomen may also seem to protrude. Mildly present at birth, Pectus Excavatum usually becomes more serious throughout childhood. It can magnify considerably during the teenage growth years.

Cause:

Pectus Excavatum tends to run in families and is often present at birth. Pectus excavatum occurs in an estimated 1 in 300-400 births, with male predominance (male-to-female ratio of 3:1). The condition is typically noticed at birth, and more than 90% of cases are diagnosed within the first year of life. Worsening of the appearance of the chest and the onset of symptoms are usually reported at the time of rapid bone growth in early teenage years. Many patients are not brought to the attention of a pediatric surgeon until the time that such changes are noted by the patient and the family.

Symptoms:

The inward facing sternum can apply pressure to the chest organs which can cause shortness of breath and restricted growth of the heart and lungs. Children with moderate to severe defects often experience shortness of breath, exercise intolerance and chest pain. These are the result of compression and displacement of the heart and secondary lung compression.

Some patients with pectus excavatum experience chest and back pain. This usually is musculoskeletal in origin, and the exact cause of it is poorly understood. The association of scoliosis (curvature of the spine) with pectus excavatum or carinatum is quite common. Mild cases may respond to an exercise and posture program, whereas more severe cases require surgical correction.

The appearance of the chest can be very disturbing to pre-teens and young teenagers. Problems with self-esteem and body image perception are frequently

reported in this age group. The condition may result in appearance and self-esteem issues as well as physiological concerns.

Diagnosis:

Diagnosis of pectus excavatum can be made after a complete health history and physical examination. Most patients undergo a chest x-ray during their initial evaluation. This helps the surgeon screen for other chest abnormalities or scoliosis. A computed tomography (CT scan) may also be performed to define the anatomy of the chest. If the patient suffers from respiratory symptoms, a pulmonary function test may also be performed to determine the degree to which lung function is compromised.

Additionally, an electrocardiogram (ECG or EKG) and an echocardiogram may be performed. An ECG is a test that records both normal and abnormal electrical activity of the heart. An echocardiogram is a procedure that uses sound waves to study the structures and function of the heart.

Treatment:

Surgical correction of pectus excavatum is done for medical reasons. The most common indication for operative repair of pectus excavatum is to achieve anatomical correction of this congenital chest wall deformity. This is particularly important in young teenagers where the appearance of the chest can result in significant problems related to body image and self-esteem. Other indications include exercise and physical activity limitations, evidence of cardiac and/or pulmonary dysfunctions, chest pain, and/or psychological distress.

The operation is easier and the recover time faster in children who are preadolescent, because their bones and cartilage are more flexible. However, there has been an increase in the number of teenagers undergoing the procedure and results are equally good in older patients up to their mid-twenties.

Surgical intervention:

The surgical correction of pectus excavatum is done using the Nuss technique. This technique is a minimally invasive surgery (MIS), meaning the surgery is done using minimal access with small incisions and a small camera (thoracoscope). The operation for correction starts with general anesthesia and the placement of an epidural catheter for the management of pain after the operation. Two lateral incisions, about 2 inches long, are made on either side of the chest for insertion of a curved steel bar under the sternum. A separate, small lateral incision is made to allow for a thoracoscope (small camera). The use of this camera, allows for direct visualization of the bar as it is passed under the sternum. The bar, which is individually curved for each patient, is used to pop out the depression. It is then fixed to the ribs on either side and the incisions are closed and dressed. A small steel, grooved plate may be used at the end of the bar to help stabilize and fix the bar to the rib. The bar is not visible from the

outside and stays in place for a minimum of two years. When it is time, the bar is removed as an outpatient procedure.

After surgery:

The immediate recovery time in the hospital is 4-5 days. Attention is paid to postoperative pain management, encouragement to breath deeply, assistance with movement (so as not to dislodge the bar), and patient/parent education. After discharge, the patient is expected to slowly resume normal, but restricted, activity. Most children are able to return to school in two to three weeks, with exercise restrictions (i.e. no physical education, no heavy lifting, etc.)

Activity Restriction:

Good posture with a straight back is very important following surgery. Patients are also instructed to avoid any bending at the hip and to not slouch for the first month. Heavy lifting is not permitted for 1 month following surgery (patients are not allowed to carry heavy book bags for at least 4 weeks), and contact sports are to be avoided for at least 3 months. After 3 months, the pediatric surgeon will determine the level of activity restrictions for the patient. Care must be taken in all activities to minimize risk of contact injury.

Bar Removal:

The bar can be removed 2 years after the repair of the pectus excavatum in an outpatient setting. Patients are not restricted from any activities, except for 1 or 2 days after this minor procedure

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