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Patient handout for Pectus Carinatum

Pectus carinatum is characterized by a protrusion of the sternum that occurs as a result of an abnormal and unequal growth of the costal cartilage connecting the ribs to the sternum. Rather than growing flat along the chest wall, the costal cartilages grow outward pushing the sternum forward, giving it a bird like appearance. Another name for pectus carinatum is 'pigeon chest'. It is a cartilage problem not a bone problem. There can be asymmetry of the chest with one side more prominent than the other. Pectus carinatum is reported to occur less commonly than pectus excavatum.

The cause of pectus carinatum is not known. This deformity occurs in approximately 1 out of 1500 children, often runs in families, and is seen more commonly in males than females. The deformity presents later in childhood than pectus excavatum and becomes more severe as the child grows. Some children with pectus carinatum report that they have chest pain and shortness of breath or limited stamina with exercise. Some children can develop scoliosis. Some children develop self esteem issues related to the appearance. Other children have no symptoms.

How pectus carinatum is treated:

For mild cases there is no reason to do any treatment. For more severe cases or if the family would like to pursue treatment, the standard treatment is bracing of the chest wall. This is done by custom fitting a circumferential external brace that puts constant force on the most prominent portion of the sternum or cartilages in order to cause flattening of the chest wall. Bracing is done by an orthotist skilled in care of children with chest wall deformities.

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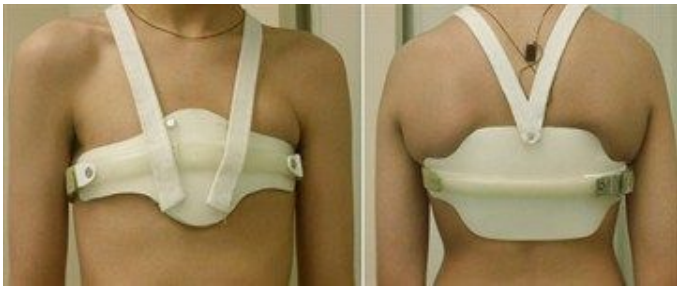

Children can be braced in childhood through adolescence with good results. The brace must be worn throughout the day and night (usually 16-20 hours a day) to be most effective and often for a period of many months to more than a year. Younger children often respond faster that teenagers but must be followed for recurrence during puberty. Children undergoing external chest wall bracing will be followed by both the orthotist and the pediatric surgeon. If your insurance does not cover bracing the brace usually runs about $2,000- $2,500.

Surgery is usually not needed and only offered if bracing does not result in the desired correction or if the child has completed puberty and the skeleton is too stiff to respond to bracing. Surgical repair (Ravitch procedure) is done through a horizontal chest incision across the mid chest. In this repair, the abnormal costal cartilages are removed, preserving the lining that covers the outside of the cartilage, allowing the sternum to be pushed downward in a more normal position. This procedure takes several hours.

In certain patients, an osteotomy (a break) in the sternum is done to allow the sternum to be positioned downward. In addition, to keep the sternum in the desired position after the removal of the cartilages and the osteotomy, a temporary metal chest strut (bar) may need to be placed.

What is the care in the hospital following surgery?

The surgical repair of pectus carinatum is a painful procedure. Length of stay in the hospital is determined primarily by pain control and usually ranges from 5-10 days.

Anesthesia and and care at time of surgery

At the time of surgery, an epidural catheter will be placed in your child's back for continuous local anesthesia and will stay in place for several days. While the epidural is in place, a urinary catheter will drain urine from the bladder. An intravenous (IV) catheter will be inserted for giving fluids and IV medications. Sometimes nasal oxygen is needed and sometimes the surgeon will place a tube to drain fluid from the surgical area. All of these therapies are temporary and will be discontinued when no longer needed, usually before discharge.

Day after surgery

Your child will be expected to get up out of bed and walk the day following surgery and will need to practice deep breathing in order to keep the lungs healthy and prevent pneumonia. Physical therapy will be consulted to help with movement restrictions.

Constipation

Constipation is a common problem for children on narcotics. Laxatives will be started in the hospital and should be continued, as needed, at home after discharge.

Hospital Discharge

Children will be discharged when they are comfortable on oral pain medication, are eating and drinking without difficulty and have no fever or signs of an infection. If a surgical drain was placed at the time of the operation, your child may go home with the drain in place. The nursing staff will teach you how to take care of the drain while your child is at home. The drain is usually removed at the first clinic visit.

Homecare After Surgery

Children who have a chest strut placed during Ravitch procedure will be seen at least annually after the first postoperative visit. The chest strut is expected to stay in place for 1-2 years.

- A shower can be taken 3 days after surgery. Have your child take the film dressing off before the shower and leave the tape strips in place. These will fall off on their own.
- There are no stitches to be removed. These are under the skin and dissolvable.
- Narcotic pain management may be required for up to one month after surgery.
- Constipation is a common problem, and daily use of laxatives while on narcotics is recommended.
- Redness or swelling of the incision(s) should be reported as soon as noted.
- If you child is discharged with a drain in place, it will be removed in the surgical office when the draining had stopped.
- Sports may be resumed as soon as the surgeon determines this is safe this is usually a few months after surgery. *** above information adapted from USCF website

There are two companies in Alaska that offer Pectus Carinatum bracing. As a courtesy we have faxed the a prescription to one of the companies, but you are free to use whichever company you would prefer.

Pectus Exercises

Background
Children with pectus excavatum/carinatum often have a posture which makes the chest appear worse. The typical pectus posture includes forward sloping shoulders and a belly that sticks out. A mild pectus may appear to be severe simply because the posture is so poor.

Purpose
The purpose of the exercise program is to get the child to straighten the backs and pull the shoulders back and develop a “military” posture.

Technique
The exercise program needs the cooperation of both the child and the parent. The best way to motivate the child to do the exercises may be to have the child stand in front of a mirror to show how improving the posture improves the look of the chest.

Exercise #1 – Back Straightening Exercise
Hands are placed behind the head and fingers interlocked. The elbows are pulled back as much as possible and the head and neck needs to remain straight. This posture causes the chest to fill out in front. The child then bends from the hips forward and down. This position is held for two to three seconds. It is very important that during the exercise the elbows, head and neck remain straight. The child should do this exercise 25 times each day. This exercise will straighten the back and pull the shoulders back.

Exercise #2 – Strengthening the Chest Muscles
The child, if able, should do 25 push-ups each day. Another exercise to strengthen the chest muscles is to lie on his/her back on the floor with arms extended out from the body. Place small weights in each hand and keeping arms straight, bring them together over the chest. The child should do this exercise 25 times each day.

Exercise #3 – Chest Expansion
The child breathes in as deeply as he/she can, pulling shoulders back while taking in a breath. The child should then hold his/her breath for as long as possible. This exercise should be done while keeping the back as straight as possible. The child should do this 20 times, twice each day.

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Total exercise time should be no more than ten minutes per session. The child should do these exercises immediately upon getting out of bed in the morning, and before going to bed in the evening. During the day, the child should be active. Motivation is extremely important and it is important that the child be monitored on a regular basis or he/she may lose interest. Taking an interest in the child's activities not only motivates the child but also builds good communication.

An exercise program like this will not cure a severe pectus excavatum. However, it can help poor posture, which may make even a good surgical result look bad.

(Last edit 2/2019)

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