

<u>CAUSE</u>	<u>SYMPTOMS</u>	<u>TREATMENTS</u>	<u>DETERMINING DX</u>
<ol style="list-style-type: none"> 1. Motor Vehicle Crash 2. Repetitive Microtrauma 3. Trauma 4. Overuse of Arms 5. Respiratory viral infection 6. Arthritis 	<ol style="list-style-type: none"> 1. Sharp Sternal Pain 2. Pain w/deep breathe/cough 3. Tenderness at Sternum 5. Redness at Anterior Rib attachment 	<ol style="list-style-type: none"> 1. Chiropractic Care 2. Physiotherapy 3. Heat/Ice 4. Medication 5. Electrical Stim. 	<ol style="list-style-type: none"> 1. Physical Exam 2. Ortho/Neuro Exam 3. X-ray/MRI 4. CT Myelogram (rule out other diagnosis) 5. All imaging would be to rule out all other diagnosis

COSTOCHONDRITIS

Costochondritis is a self-limited condition defined as inflammation of costochondral junctions of ribs or chondrosternal joints, usually at multiple levels and lacking swelling or induration. Pain is reproduced by palpation of the affected cartilage segments and may radiate on the chest wall. Tietze syndrome is an inflammatory process causing visible enlargement of the costochondral junction. It occurs in a single rib 70 percent of the time, usually within costal cartilages of ribs two through three, predominantly in rib two. Infectious, rheumatologic, and neoplastic processes may cause it. Infection is particularly associated with chest wall trauma, such as in patients with stab wounds, postsurgical patients, and those who use intravenous drugs. Less common causes include primary neoplasms of the rib, lung, pleura, and muscle, and metastatic disease to the costal cartilage.



Anatomy

The diagnosis of costochondritis relies on patient history and physical examination findings; therefore, understanding of the chest anatomy is important. Ribs consist of bone and cartilage, with cartilage serving as an elastic bridge between the bony portion of the rib and the sternum.⁸ Anteriorly, the costal cartilage of the first rib connects with the manubrium via a rigid fusion of bone and cartilage. The next seven pairs of ribs articulate with the sternum via cartilage at synovial-lined joints. Ribs eight through 10 attach in front to the cartilaginous

portion of the rib above them and often have synovial-lined interchondral articulations. The lowest two ribs do not articulate with any structure anteriorly. The ribs move with respiration and with truncal motion or movement of the upper extremities. The innervation of the thoracic wall is supplied mostly by the intercostal nerves. Impingement of these nerves by movement of the overlying rib or cartilage can cause pain. The shoulder girdle muscles develop in the lower cervical region and carry this innervation with them as they move to attach to the chest wall. Thus, cervical or shoulder problems may refer pain to the chest wall.

Epidemiology

Costochondritis can affect children as well as adults. A study of chest pain in an outpatient adolescent clinic found that 31 percent of adolescents had musculoskeletal causes, with costochondritis accounting for 14 percent of adolescent patients with chest pain. In this series, no definite cause of chest pain was found in 39 percent of cases.⁴ In a prospective series of children three to 15 years of age presenting to an emergency department or cardiac clinic with chest pain, chest wall pain was the most common diagnosis, with respiratory and psychogenic conditions the next most common diagnoses.

Costochondritis is a common diagnosis in adults with acute chest pain. It is present in 13 to 36 percent of these patients, depending on the study and the patient setting. In a prospective study of adult patients presenting to an emergency department with chest pain, 30 percent had costochondritis. A prospective study of episodes of care for chest pain in a primary care office network found musculoskeletal causes in 20 percent of episodes of care, with costochondritis responsible for 13 percent. These data are similar to a study of patients with noncardiac chest pain that found reproducible chest wall tenderness (although not specifically defined as costochondritis) in 16 percent of patients.³ A European study found a higher prevalence of musculoskeletal diagnoses in patients with chest pain presenting in primary care settings compared with hospital settings (20 versus 6 percent, respectively).

HISTORY AND PHYSICAL EXAMINATION

The primary symptom of costochondritis is chest wall pain of varying intensity, typically described as sharp, aching, or pressure-like. The pain is often exacerbated by upper body movement, deep breathing, and exertional activities. History of an antecedent illness with coughing, recent strenuous exercise, or physical activities that stress the upper extremity is common. Although the second to fifth costochondral joints are most often affected, especially ribs three and four, any of the seven costochondral junctions can be involved. Pain can be noted at more than one location, but most often is unilateral.

Pain that is reproduced by palpation of the typically affected areas suggests costochondritis, but depends on the exclusion of underlying causes. Although pain reproduced by chest wall palpation is considered atypical for a cardiac cause, it does not exclude it. In a study of costochondritis in an emergency department, 6 percent of patients with pain reproduced by chest wall palpation were also diagnosed with myocardial infarction, compared with 27 percent of the control group who had chest pain without pain to palpation.¹ In another study of noncardiac chest pain in an emergency department, almost 3 percent of patients had adverse coronary events at 30 days follow-up