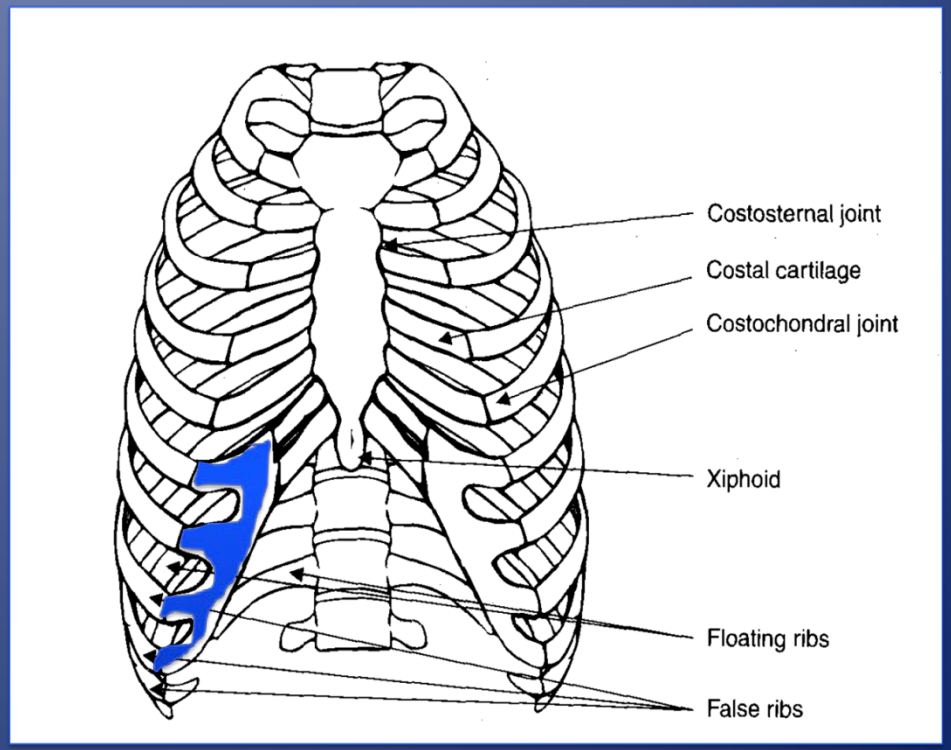
What is Slipping Rib Syndrome?

- It is caused by a laxity of the intercostal attachments allowing the lower cartilage to slip under the adjacent rib, sometimes causing a click or a rub
- This can lead to irritation of the intercostal nerve leading to discomfort and pain
- It is often misdiagnosed and can lead to long term abdominal and/or thoracic pain



McBeath AA, Keene JS. The rib-tip syndrome. J Bone Joint Surg Am. 1975 Sep;57(6):795-7

History

- First described by Cyriax in 1919
- Davies-Colley performed costal cartilage resections with good results in 1922
- Porter published a report of slipping ribs in children in 1985

Etiology

- May or may not be related to trauma
- Often related to certain movements
  - Turning in bed, bending, twisting
  - Deep breathing, coughing, sneezing
  - Exercise
- May be unilateral or bilateral
- Females > Males 4:1
- Reported from ages 7-80

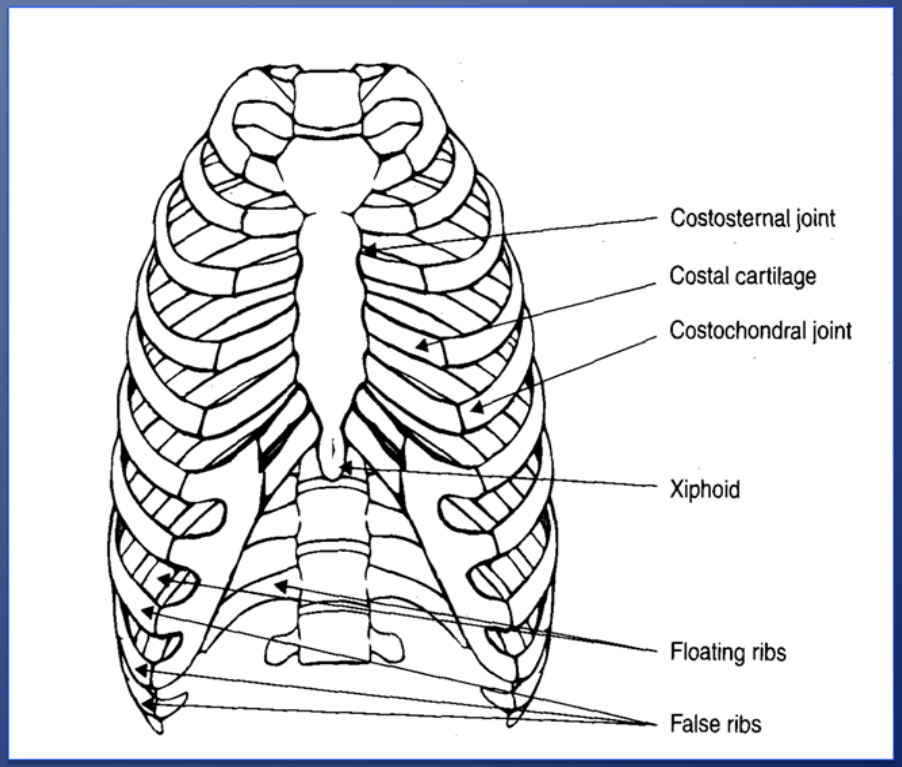
Pain

- Abdominal or Thoracic
- Many patients will have already undergone an unnecessary but extensive workup
  - Common studies include:
  - Xray, MRI, CT, Ultrasound, EMG, lab work
- They may be labeled as a “chronic pain” patient

Pathophysiology

- Ribs 8, 9 and 10 are most commonly affected. They are the false ribs – they are attached to each other by cartilage instead of to the sternum. These attachments can form incorrectly or become disrupted and therefore are most likely to be mobile.

- When the ribs are not attached, they are able to move underneath of each other and irritate the intercostal nerve that runs beneath the rib. This leads to sharp pains at the site and may lead to other symptoms because it can radiate to the abdominal and thoracic sympathetic nerves.

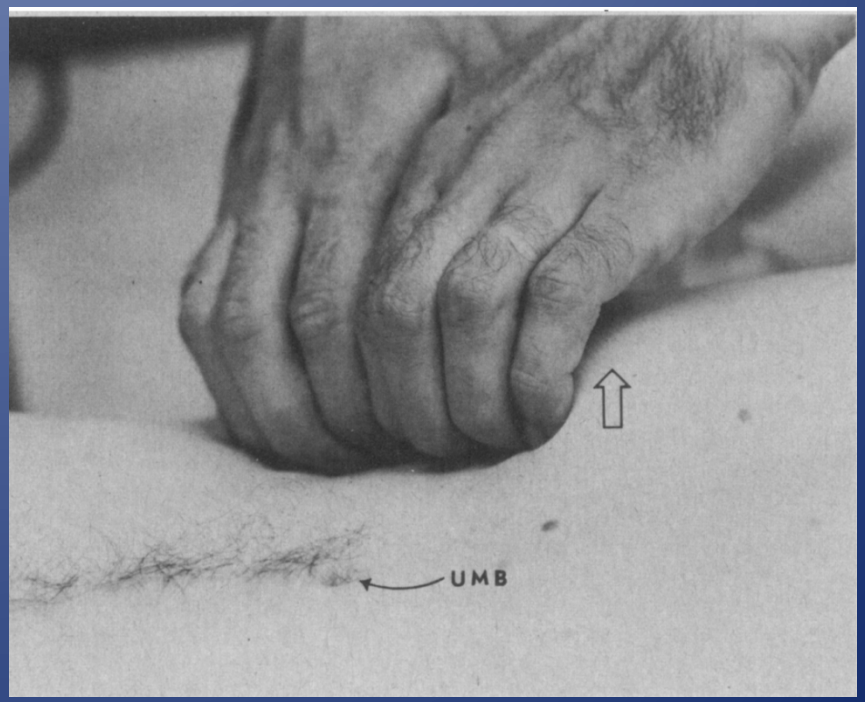


Signs and Symptoms

- Slipping, clicking, popping sensation may be followed by sharp, stabbing pain, or may be dull achy pain of long duration
- Bending, twisting, stretching, lifting, deep breathing and coughing can trigger or worsen the symptoms
- Usually one sided
- May have abdominal or chest wall pain

Physical Exam

- **Hooking maneuver**
  - Classic diagnostic maneuver which reproduces the movement (and sometimes pain) by manually subluxing the lower cartilages



- Palpation of the chest wall may reproduce the pain but is not diagnostic

Diagnostic test

- Rib block
  - Local anesthesia
  - Localizes the affected ribs
  - Confirms the diagnosis if the pain resolves, especially with postures that usually exacerbate the pain
  - May also be therapeutic in some cases
  - Rarely is any further imaging necessary

Differential Diagnosis

- **Costochondritis**
  - Tenderness with palpation at the upper costochondral and costosternal junctions
  - Affects multiple ribs
  - May be associated with strain or overuse; most common in females
  - Pain may radiate around the chest wall
  - Treated with NSAIDs, rest, stretching, physical therapy if severe

- **Tietze syndrome**
  - Painful localized swelling of the costosternal, sternoclavicular or costochondral joints
  - Usually 2nd and 3rd ribs
  - Cause is unknown
  - Treated with NSAIDs, rest, physical therapy

- **Precordial Catch Sydrome** (Texidor's twinge)
  - Brief episodes of sharp pain that localize to the left sternal border or cardiac apex
  - May occur at rest or mild activity and is worse with inspiration
  - Self-limited

Differential Diagnosis

- **Sternalis syndrome**
  - Localized tenderness over the body of the sternum or underlying sternalis muscle
  - Palpation often causes pain to radiate bilaterally
  - Usually self-limited
- **Xiphoidalgia**
  - Localized tenderness over the xiphoid process
  - Aggrevated by eating a heavy meal, bending and twisting, heavy lifting, forceful coughing
  - Analgesics and injections of local anesthetics/steroids usually curative
- **Spontaneous sternoclavicular subluxation**
  - Spontaneous and atraumatic subluxation of the sternoclavicular joint
  - Females 40-60 yo
  - Supportive therapy recommended

Differential Diagnosis

Patients with slipping rib syndrome mainly complain of chest pain, and upper abdominal pain.

Chest wall and abdominal pain have multiple causes. These should be ruled out if the diagnosis of slipping rib is unclear.

This list is not exhaustive:

- Gallbladder disease
- Esophageal disease
- Gastric ulcer
- Hepatosplenic abnormalities
- Pleuritic chest pain
- Bronchitis
- Asthma
- Myocarditis
- Angina
- Arrhythmia
- Rib fractures
- Neoplasms
- Herpetic nerualgia
- Sickle cell anemia

Definitive Diagnosis

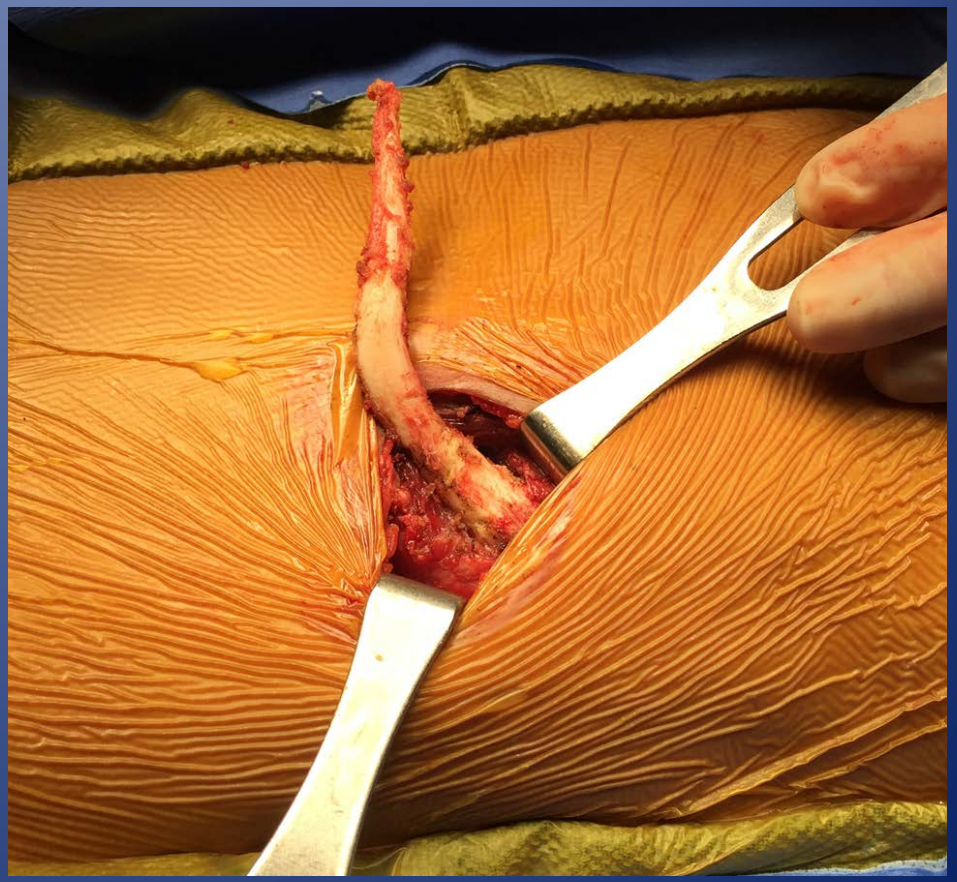
- Made by clinical presentation
- Hooking maneuver is diagnostic
- Rib blocks can localize the ribs and confirm the diagnosis

Treatment

- Conservative therapy
  - Reassurance, rest, ice, heat, NSAIDS, physical therapy, massage, acupuncture
- Repeated injections of local anesthetics and/or steroids to the intercostal nerves may be therapeutic
- Surgical excision of the subluxing cartilages removes the inciting irritant, curing the pain and the sensation of clicking or slipping

Surgery

- Failure of conservative management
- Involves excision of the costal cartilage
- A small incision is made over the slipping rib.
- Soft tissues are dissected down to the external oblique fascia which is then divided. The muscle is retracted, exposing the chest wall.
- The cartilages are then easily palpable and the slipping ribs are again identified.
- Cartilages are removed to the costochondral junction and sent to pathology.
- The adjacent cartilages are evaluated to ensure that their connections are firm and do not sublux.



Surgery

- Paravertebral blocks or rib blocks can be performed for pain control after surgery.
- Once adequate pain control is achieved, the patient is discharged home and may resume regular activities once off pain medication.

Outcomes

- The majority of patients achieve good relief of their preoperative symptoms
- There is a small chance of recurrence (regrowth of cartilage) that may lead to reoperation

Summary

- Slipping rib syndrome is a cause of chest wall and abdominal pain which most commonly affects ribs 8-10 (false ribs).
- Patients feel their rib slipping or clicking and may feel the pain as sharp or dull and aching.
- Diagnosis can be made with history and physical exam and the Hooking Maneuver is the most useful test.
- If conservative management fails, surgery is an option to alleviate the symptoms.