Flail Chest

Flail chest is a serious condition caused by trauma to the chest that results in multiple, consecutive rib fractures, causing a portion of the rib cage to detach. Instability of the chest wall causes paradoxical expansion and contraction of the chest with each breath, resulting in inadequate ventilation. Patients with flail chest will likely be short of breath and have rapid, shallow breaths in an attempt to compensate. Complaints of sharp chest pain are common, due to irritation of lung tissue caused by broken bones in the chest. Pain management is an essential component of treatment; however, narcotics should be avoided, as these medications can induce respiratory depression. Intercostal nerve blocks, and epidural or intrathecal analgesia are highly recommended. Intubation and mechanical ventilation may be necessary for some patients, in an effort to reestablish lung expansion and to ensure adequate ventilation and oxygenation. All patients with flail chest should be monitored closely for signs and symptoms of pulmonary contusion.



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Cause/Mechanism

Trauma
Trauma-spike
Trauma to the chest resulting in multiple, consecutive rib fractures can cause a portion of the rib cage to detach. The resulting instability of the chest wall causes paradoxic chest movement with each breath, resulting in inadequate ventilation.

Assessment

Shallow Respirations
Shallow-water Respirations
Trauma to the chest wall prevents normal expansion of the lung, limiting a patient’s ability to adequately ventilate. As a result, patients will likely be short of breath and breathe using rapid, shallow breaths in an attempt to compensate.

Chest Pain
Chest Pain-bolt
Patients with flail chest will experience sharp chest pain related to irritation of lung tissue caused by broken bones in the chest.

Paradoxical Chest Movement
Parrot-ox Chest Movement
In uninjured patients, the chest expands with inspiration, and contracts with expiration. In patients with consecutive rib fractures; however, movement of the chest is paradoxical. Patients with flail chest will present with chest contraction during inspiration (flail area sucked in), and chest expansion (flail area bulges out) during expiration. Chest movement is asymmetric and uncoordinated.

Interventions

Mechanical Ventilation
Mechanical Vent-ventilator
Intubation and mechanical ventilation may be necessary for some patients, in an effort to reestablish lung expansion and to ensure adequate ventilation and oxygenation. Bag-valve-mask ventilation should be performed using 100% oxygen.

Analgesics
A-nail-Jay-Z
Pain management is essential and will allow the patient to increase the tidal volume of each breath, thereby improving ventilation and increasing oxygenation of the blood. Narcotics should be avoided, as these medications can induce respiratory depression.

Intercostal Nerve Blocks
In-ribs Nerve Blocks
Intercostal nerve blocks, and epidural or intrathecal analgesia, are highly recommended for effective pain management in patients with flail chest.

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Considerations

Surgical Rib Fixation

Ribs Fixed-in-place

Surgical fixation of the ribs may be performed, as this intervention has been shown to reduce the amount of time that the patient is subjected to mechanical ventilation.

Monitor Pulmonary Contusion

Monitor Lung Bruising

Pulmonary contusion is a life-threatening condition that is characterized by pooling of blood in the alveoli of the lungs after injury or trauma to the lung tissue. Patients should be monitored closely and suctioned as needed to maximize positive outcomes. Damage to the lung may also result in a pneumothorax or collapsed lung.

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