

Fractures

Definition

A fracture is a break in a bone, usually due to trauma or repetitive stress. It can be a partial or complete break and can occur in any bone in the body.

Detailed Pathophysiology

Fractures occur when the force applied to a bone is greater than the bone can withstand. The bone may break completely or partially, depending on the force and the strength of the bone. Fractures can be classified as simple or compound, depending on whether the bone breaks through the skin.

Types/Forms

There are several different types of fractures, including:

1. Closed or simple fracture: The bone is broken, but the skin is intact.
2. Open or compound fracture: The bone breaks through the skin, creating an open wound.
3. Greenstick fracture: The bone is bent and partially broken, but not completely.
4. Comminuted fracture: The bone is broken into several pieces.
5. Spiral fracture: The bone is twisted and broken.
6. Stress fracture: A small crack in the bone due to repetitive stress.
7. Pathological fracture: A fracture caused by an underlying medical condition, such as osteoporosis or cancer.

Causes

Fractures can be caused by trauma, such as a fall or car accident, or by repetitive stress, such as in athletes or workers who perform repetitive motions. The causes can differ by age and gender, as certain groups are more prone to certain types of fractures.

1. Children: Fractures in children are usually caused by falls or sports injuries.
2. Adults: Fractures in adults are often caused by trauma, such as car accidents or falls from height, or by repetitive stress, such as in athletes or workers who perform repetitive motions.
3. Elderly: Fractures in the elderly are often caused by falls, and may be related to underlying medical conditions such as osteoporosis.

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Clinical Manifestation

The symptoms of a fracture can vary depending on the severity and location of the fracture. Some common symptoms include:

1. Pain and swelling at the site of the fracture
2. Bruising or discoloration
3. Deformity or abnormal positioning of the affected limb or joint
4. Inability to move or use the affected limb or joint
5. Numbness or tingling in the affected limb or joint

Diagnostic Criteria

Diagnosis of a fracture is typically made by imaging, such as X-ray or MRI. Blood tests may also be used to evaluate for underlying medical conditions, such as osteoporosis.

Diagnosis

A fracture is diagnosed through imaging, such as X-ray or MRI, which can show the location and severity of the fracture.

Treatment

Treatment of a fracture depends on the severity and location of the fracture. Treatment options may include:

1. **Immobilisation:** The affected limb or joint may be immobilised with a cast or brace to allow the bone to heal.
2. **Surgery:** In some cases, surgery may be necessary to realign the bone or stabilise the fracture. Here are some of the most common types of surgeries for fractures:

- **Open Reduction and Internal Fixation (ORIF):** This surgery involves making an incision to expose the fracture and then using screws, pins, plates, or rods to hold the bone fragments together so they can heal properly.
- **Closed Reduction and Internal Fixation (CRIF):** This surgery is similar to ORIF, but the fracture is reduced (realigned) without making an incision. Instead, the surgeon uses X-rays or other imaging techniques to guide the placement of the internal fixation devices.
- **External fixation:** In this type of surgery, metal pins or screws are placed into the bone above and below the fracture, and an external frame is attached to the pins/screws. The frame holds the bone fragments in place so they can heal.

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Treatment

- **Intramedullary nailing:** In this procedure, a metal rod is inserted into the centre of the bone to hold the bone fragments in place. The rod is usually inserted through a small incision near the fracture site.
- **Joint replacement:** If a fracture affects a joint, joint replacement surgery may be necessary to restore normal joint function. This involves removing the damaged joint and replacing it with an artificial joint.

The type of surgery used will depend on the nature and severity of the fracture, as well as the patient's overall health and other factors. The treating physician will evaluate the individual case and determine the most appropriate course of treatment.

3. **Pain management:** Pain medication may be prescribed to manage pain associated with the fracture.
4. **Rehabilitation:** After the bone has healed, physical therapy may be necessary to regain strength and mobility in the affected limb or joint.

Contraindications/cautions

Contraindications/cautions for fractures may vary depending on the location and severity of the fracture. However, some general contraindications/cautions for fractures include:

1. **Immobilisation:** Immobilization is often necessary to allow the fracture to heal properly. However, prolonged immobilisation can lead to muscle atrophy, joint stiffness, and decreased range of motion. Therefore, it is important to balance immobilisation with early mobilisation and physical therapy to promote healing and prevent complications.
2. **Weight-bearing:** Weight-bearing may be restricted in some fractures, especially those involving the lower extremities. This is to prevent further damage to the affected bone and promote healing. However, weight-bearing restrictions should be lifted gradually as the fracture heals to prevent complications such as delayed union or non-union.
3. **Medications:** Some medications may affect bone healing and should be used with caution in patients with fractures. For example, nonsteroidal anti-inflammatory drugs (NSAIDs) may interfere with bone healing and should be used with caution in patients with fractures. Similarly, corticosteroids may delay bone healing and increase the risk of complications in patients with fractures.
4. **Surgery:** Surgery may be necessary to repair certain types of fractures. However, surgery carries risks such as infection, bleeding, and anaesthesia complications. Therefore, surgery should only be considered if the benefits outweigh the risks.

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Contraindications/cautions

5. **Infection:** Fractures can increase the risk of infection, especially if the fracture is open or if surgery is required. Therefore, it is important to monitor for signs of infection such as fever, redness, swelling, and drainage and to promptly treat any infections that arise.

6. **Comorbidities:** Patients with certain comorbidities such as diabetes, peripheral vascular disease, and osteoporosis may be at increased risk of complications from fractures. Therefore, it is important to manage these comorbidities appropriately to prevent complications and promote healing.

Gender and age differences

Gender and age differences may impact the type and severity of fractures, as well as the rate of healing. For example, women are more prone to osteoporosis, which can increase the risk of fractures in older age. Certain types of fractures, such as hip fractures, are more common in elderly individuals.

Nursing Assessment

Nursing assessment for fractures may include:

1. Assessing the affected limb or joint for pain, swelling, bruising, and deformity.
2. Assessing the patient's mobility and ability to perform activities of daily living.
3. Assessing the patient's pain level and response to pain medication.
4. Assessing for any signs of infection, such as redness or drainage at the site of the fracture.

Nursing Diagnosis

Nursing diagnosis for fractures may include:

1. Acute pain
2. Impaired physical mobility
3. Risk for infection

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Nursing management

Nursing management for fractures may include:

1. Administering pain medication as ordered to manage pain.
2. Assisting with immobilisation of the affected limb or joint.
3. Monitoring for signs of infection and providing wound care as needed.
4. Assisting with physical therapy and rehabilitation after the bone has healed.
5. Educating the patient on proper care of the affected limb or joint and signs of complications to watch for.