

Clavicle Fractures

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Introduction:

Clavicle fractures are common injuries, accounting for around 3% of all fracture. They most commonly occur in adolescents and young adults as a result of indirect or direct trauma to the shoulder region, however a second peak in incidence also occurs over the age of 60, associated with the onset of osteoporosis [1-6].

Etiology:

Clavicle fractures usually result from a fall on the lateral shoulder or, less often, a direct blow.

Epidemiology:

Clavicle fractures account for approximately 2.6 % of all fractures . The peak incidence occurs in children and young adults. Over one-third of clavicle fractures in males occur between the ages of 13 and 20 years, while 20 % of clavicle fractures in women occur in the same age group. Incidence falls over subsequent decades before rising again in older men and women. In a study of 1000 consecutive fractures, 69 % occurred in the middle third of the bone, 28 % in the distal third, and 2.8 % in the proximal third.

Classification:

Clavicular fractures can be classified by the Allman classification system, determined by the anatomical location of the fracture along the clavicle:

Type I – fracture of the middle third of the clavicle, constituting 75% clavicular fractures (as the middle third is the weakest segment)

They are generally stable, although significant deformity is usually present

Type II – fractures involving the lateral third of the clavicle and constituting around 20% of all clavicular fractures

When displaced, these type are often unstable

Type III – remaining 5% occur in the medial third of the clavicle, commonly associated with multi-system polytrauma

As the mediastinum sits directly behind the medial aspect of the clavicle, they can be associated with neurovascular compromise, pneumothorax, or haemothorax

Mechanism of injury:

Approximately 87 % of clavicle fractures are caused by a fall onto the shoulder. Traffic accidents and sports account for most fractures among the young. Of injuries caused by traffic accidents, 39 % occur in cyclists, 26 % in car drivers or passengers, 17 % in pedestrians, and 17 % in motorcyclists.

Unusual causes of clavicle fractures include a direct blow from an object to the clavicle (7 %) and indirect trauma from falls onto an outstretched hand (6%). There is no correlation between the mechanism of injury and the site of fracture.

Clinical Features:

Patients will present with sudden-onset localized severe pain, made worse on active movement of the arm, nearly always following trauma. On examination, there will be focal tenderness, with deformity and mobility at the fracture site.

Due to the subcutaneous location of the clavicle, it is important to specifically look for open injuries or threatened skin (appearing as tented, tethered, white, and non-blanching skin); it is essential that any threatened skin is recognized as it implies impending conversion to an open injury.

Ensure to check neurovascular status of the upper limb, given the propensity for brachial plexus injuries following a clavicle fracture.

Investigations:

Plain film anteroposterior and modified-axial radiographs of the affected clavicle should be performed, allowing any displacement to be fully assessed.

CT imaging is rarely indicated, but may be needed to assess medial clavicle injuries, which can be difficult to fully assess on plain radiographs.

Management:

Most clavicle fractures can be treated conservatively, even those with significant deformity, as evidence has shown no long-term benefit to surgical management over a conservative approach, with >90% uniting despite displacement. Moreover, as the clavicle is subcutaneous, metalwork is often prominent and therefore requires removal after fracture union.

Initial treatment is with a sling, which should be properly applied so that the elbow is well supported and improves the deformity. Early movement of the shoulder joint is recommended, to prevent the development of frozen shoulder in these patients. The sling is generally kept on until the patient regains pain-free movement of the shoulder.

Fractures of the proximal clavicle will also need to be considered in the wider context of associated injury, such as traumatic lung injury, and managed accordingly.

Surgical Management

Open fractures will need surgical intervention.

However, surgical management for the remainder of clavicle fractures remains contentious. It is usually reserved for very comminuted fractures or those that are very shortened. It is also typically performed if the patient has bilateral fractures, to permit weight bearing.

Where fractures have failed to unite, an open reduction and internal fixation (ORIF) will be necessary, which is usually performed at 2-3 months post-injury.

Prognosis:

Non-union is a major complication of clavicle fractures, most associated with a distal third clavicular fractures. Other important complications to assess for include neurovascular injury and any puncture injury (haemothorax or pneumothorax).

Healing time for most clavicular fractures in adults is 4-6 weeks

Literature

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