Sternal Fracture Guideline

Background

Sternal fractures most commonly result from blunt, anterior chest-wall trauma and deceleration injuries in motor vehicle accidents and account for up to 8% of all thoracic trauma[1]. The frequency of their occurrence is believed to have risen with an overall reduction in the magnitude of injuries[2,][3]].

Current United Kingdom practice varies considerably regarding patients presenting to emergency departments with a traumatic sternal fracture. The primary concern in evaluating the patient with a sternal fracture is the risk of myocardial or great vessel injury from the force involved in the injury. Cardiovascular complications occurred in 0.8% of isolated sternal fractures[3,4] [3][4] with clinically significant cardiac consequences being rare with an initial normal electrocardiogram (ECG) and cardiac biomarker levels. The admitting speciality varies according to available resources but is usually general surgery, trauma and orthopaedic or thoracic surgery.

Evaluation

Early thorough clinical assessment is essential while approaching a patient with suspected isolated sternal fracture to exclude associated injuries.

- CT thorax is the imaging modality of choice especially in a high impact trauma to exclude occult intra-thoracic injury.[7][7]
- However, postero-anterior (PA) and lateral view x-rays can be sufficient to diagnose a sternal fracture if no other injuries are suspected.
- Cardiac monitoring with an initial ECG and cardiac biomarkers (troponin).

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Uncomplicated sternal fractures

- Isolated sternal fractures with no displacement or haematoma
- absence of other thoracic injuries with normal ECG and troponin
- minimal pain controlled with simple analgesia

Complicated sternal fractures

- Displaced fractures
- Retrosternal haematoma
- Moderate to severe pain
- Other associated thoracic injuries[8]
    - rib fractures (56%),
    - lung contusions (31%)
    - haemothorax (22%)
    - abnormal ECG and/or troponin
    - patients with significant risk factors for delayed union (osteoporosis, long term steroids use, advanced age and diabetes mellitus).

Management

Usually non-operative for most uncomplicated fractures[6]. Rarely operative for certain complicated fractures.

Treatment goal should include initial cardiac monitoring, ECG and troponin with optimal analgesia and referral to rehabilitation services for physiotherapy and occupational therapy.

Transfer to an MTC

Patients with complicated sternal fractures or with multi-system trauma should be discussed with the St George's MTC trauma team leader (TTL) as the first point of contact.

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MTC TTL will either recommend transfer to MTC or discussion with Thoracic team. If surgical fixation is indicated, it may be appropriate for patients to remain in the TU initially until a theatre slot becomes available.

Contact Details

Thoracic registrar

- Day 8am-8pm Bleep 7129
- Night 8pm-8am via switchboard.

Referral details to be emailed to thoracic@stgeorges.nhs.uk

Management in the Trauma Unit

If local admission is advised by thoracic team or MTC TTL, TUs must have a locally agreed pathways for admission. Repeat troponin and ECGs should be undertaken within 12-24 hrs of admission in patients with initial abnormal results. Patients requiring admission should have adequate analgesia and referral to rehabilitation services as appropriate.[9][9]

Discharge from ED

Discharge from ED can be considered in the following patients who meet **ALL** the criteria below:

- ❑ Isolated un-displaced sternal fracture
- ❑ Absence of sternal haematoma
- ❑ Normal initial ECG (or no new abnormalities or dynamic changes) with a normal initial troponin (suggest follow local trust troponin level guidance)
- ❑ Minimal pain or pain well managed with oral analgesia
- ❑ Nil other associated chest wall injuries
- ❑ Back to baseline mobility

Adequate analgesia with home advice leaflet regarding mobilisation and safety-netting should be provided. Consider follow up with local admitting team or cardiothoracic surgery in 6-8 weeks especially in patients with risk for delayed union (osteoporosis, long term steroids use, advanced age and diabetes mellitus) and to assess for delayed complications.[5]]

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