

Fracture of the Medial Clavicle Mimicking Sternoclavicular Dislocation: The Diagnostic Value of CT and 3D Reconstruction

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Abstract: *Background: Fractures of the medial third of the clavicle are rare, accounting for less than 5% of all clavicular fractures, and are often difficult to distinguish clinically and radiographically from sternoclavicular joint dislocation. We report a case highlighting the diagnostic contribution of computed tomography (CT) and three-dimensional (3D) reconstruction in this setting. Case Presentation: A 69-year-old woman presented 2 hours after being struck by a motorcycle as a pedestrian, with isolated pain of the right shoulder. Clinical examination revealed tenderness and mild swelling over the right sternoclavicular region, without skin breach, ecchymosis, or vascular or neurological deficit. Standard anteroposterior chest radiographs raised suspicion of a sternoclavicular dislocation but did not allow a definitive diagnosis. CT with 3D reconstruction demonstrated a comminuted fracture of the medial third of the clavicle with anterior displacement of the main fragment, ruled out an underlying pneumothorax, and confirmed the absence of any retrosternal or vascular extension. In the absence of neurovascular complications, no contrast-enhanced CT was performed. The patient was treated conservatively with a sling immobilization. At the last clinical follow-up, she was pain-free with satisfactory function, though she declined further radiographic controls. Conclusion: CT with 3D reconstruction is a valuable tool in the diagnostic work-up of medial clavicle fractures, allowing accurate characterization of fracture pattern, displacement and comminution, differentiation from sternoclavicular dislocation, and exclusion of associated thoracic complications, thereby guiding therapeutic decision-making.*

Keywords: medial clavicle fracture; sternoclavicular dislocation; computed tomography; 3D reconstruction; case report

Introduction

Fractures of the clavicle are among the most common fractures of the upper limb, but those involving the medial (sternal) third are distinctly uncommon, representing less than 5% of all clavicular fractures [7], [8]. They typically result from high-energy trauma, such as road traffic accidents or direct anterior chest impact [1], [2], [9].

The clinical presentation of a medial clavicle fracture closely resembles that of a sternoclavicular joint dislocation, with localized pain, swelling, and painful shoulder mobility. On standard anteroposterior chest or shoulder radiographs, the overlapping bony structures of the sternum, ribs, and mediastinum make interpretation of this region particularly difficult, and the two entities are frequently indistinguishable. This diagnostic ambiguity is clinically important, since posterior displacement in sternoclavicular dislocation can threaten the great vessels, trachea, and esophagus, whereas medial clavicle fractures, although occasionally comminuted, rarely present the same immediate risk.

Computed tomography, particularly with multiplanar and three-dimensional reconstruction, has become the reference standard for evaluating this anatomically complex region [6], [10]. We report a case that illustrates how CT and 3D reconstruction allowed accurate characterization of a comminuted medial clavicle fracture initially mistaken for a sternoclavicular dislocation on standard radiographs, and how this informed therapeutic decision-making.

Case Presentation

A 69-year-old woman with no notable medical history was struck by a motorcycle while crossing the street as a pedestrian. She presented to the emergency department 2 hours after the trauma, complaining of isolated pain in the right shoulder without other associated complaints, consistent with an isolated injury.

On clinical examination, there was localized tenderness and mild swelling over the right sternoclavicular region, without ecchymosis or open skin lesion. Shoulder mobility was painful but preserved. Distal pulses were present and symmetrical, and no vascular or neurological deficit was identified on the affected limb.

Standard anteroposterior chest radiographs were obtained and raised suspicion of a right sternoclavicular dislocation, but the overlapping osseous and mediastinal structures did not allow a confident distinction between dislocation and fracture of the medial clavicle (Figure 1).

Given this diagnostic uncertainty, a thoracic CT scan with 3D reconstruction was performed. It demonstrated a comminuted fracture of the medial third of the right clavicle with anterior displacement of the main fragment, without involvement of the sternoclavicular joint itself (Figures 2 and 3). The examination also excluded an underlying pneumothorax or other intrathoracic injury. In the absence of clinical or radiological signs suggestive of vascular or neurological complications, the CT was performed without intravenous contrast.

Given the absence of vascular, neurological, or major intrathoracic complications, and the comminuted but non-displaced-through-the-joint pattern of the fracture, conservative management was chosen. The patient was treated with a sling-and-swathe (coude au corps) immobilization.

At two years of follow-up, the patient reported no pain and satisfactory functional use of the shoulder. She declined further clinical or radiographic follow-up visits.

Figures

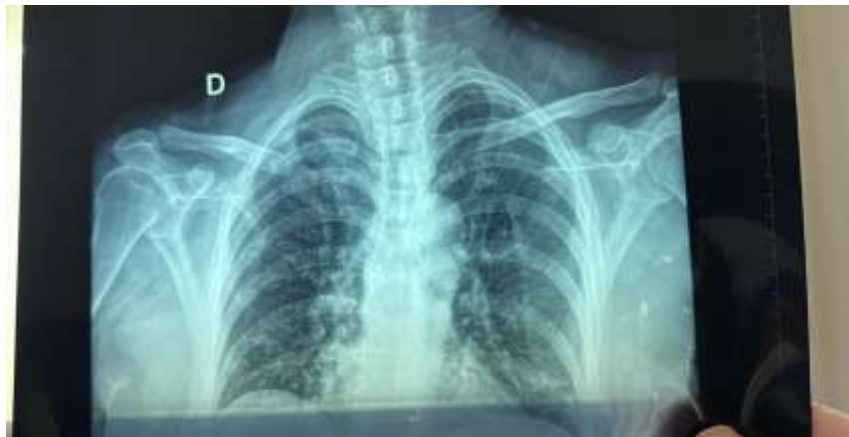


Figure 1. Standard anteroposterior chest radiograph showing asymmetry of the right sternoclavicular region, raising suspicion of dislocation but not allowing a definitive diagnosis.

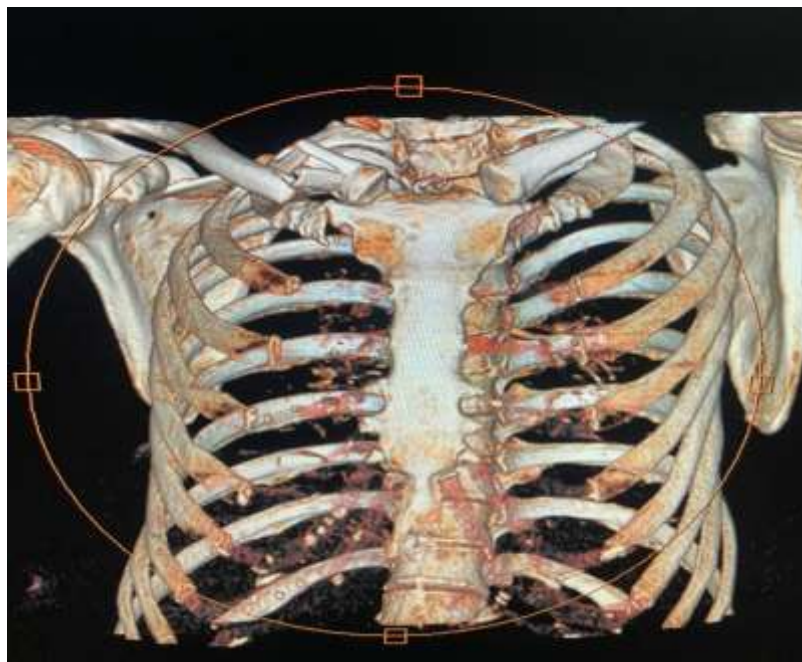


Figure 2. 3D CT reconstruction, anterior view, demonstrating a comminuted fracture of the medial third of the right clavicle with anterior displacement of the main fragment.

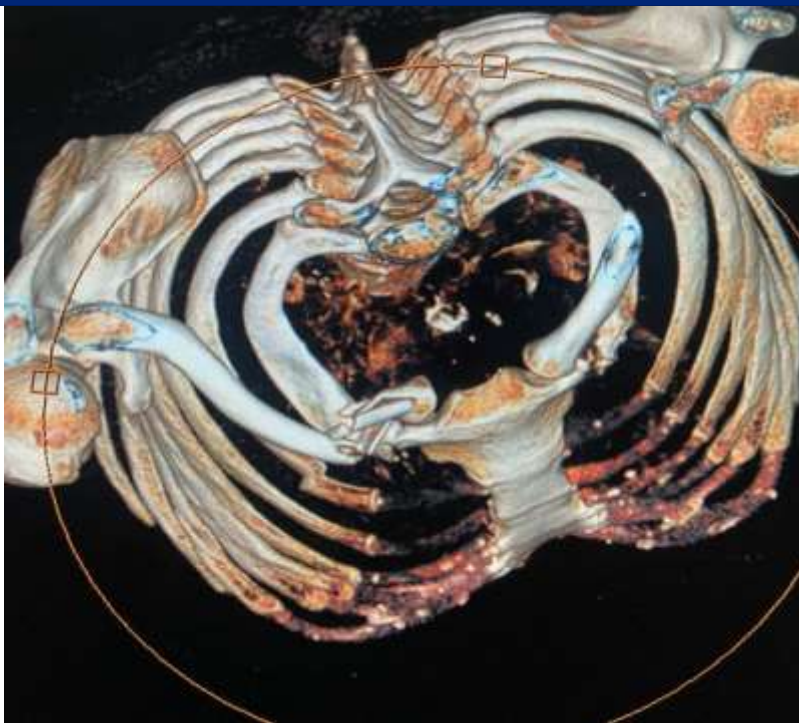


Figure 3. 3D CT reconstruction, superior view, confirming the comminuted fracture pattern and excluding involvement of the sternoclavicular joint.

Discussion

Fractures of the medial clavicle are rare and represent a genuine diagnostic challenge. Their clinical presentation overlaps considerably with that of sternoclavicular dislocation, and standard radiographs are notoriously unreliable in this region due to the superimposition of the ribs, spine, and mediastinal structures. In our patient, the initial anteroposterior chest radiograph could not distinguish between the two diagnoses, illustrating a pitfall commonly reported in the literature.

CT, and particularly 3D reconstruction, addresses these limitations by allowing direct visualization of the fracture line, the degree of comminution, and the direction and magnitude of fragment displacement, while simultaneously clarifying the integrity of the sternoclavicular joint itself [6], [10]. In our case, 3D reconstruction confirmed a comminuted medial clavicle fracture with anterior displacement and excluded true joint dislocation, information that could not be reliably obtained from standard radiographs alone.

Beyond fracture characterization, CT of the thorax also provides important information on associated injuries. In this patient, it allowed exclusion of an underlying pneumothorax, a relevant consideration given the proximity of the medial clavicle and sternoclavicular joint to the great vessels, trachea, and pleural apex. The absence of clinical signs of vascular or neurological compromise, combined with the CT findings, allowed the examination to be limited to a non-contrast acquisition, avoiding unnecessary contrast exposure in an elderly patient.

Regarding management, treatment of medial clavicle fractures is guided primarily by the presence or absence of complications and the degree of displacement [10], [11]. Non-displaced or minimally displaced fractures, as well as most comminuted fractures without neurovascular or intrathoracic complications, are generally managed conservatively with sling immobilization, as in our patient. Surgical fixation is typically reserved for cases with significant posterior displacement threatening mediastinal structures, open fractures, or fractures associated with vascular or neurological injury [11]. The favorable clinical outcome observed at two years in our patient, despite her declining radiographic follow-up, supports the appropriateness of conservative management in this setting.

This case reinforces the message that, in elderly trauma patients presenting with sternoclavicular-region pain after high-energy injury, standard radiographs should be interpreted with caution, and a low threshold for CT with 3D reconstruction is warranted whenever the diagnosis of fracture versus dislocation remains uncertain, both to guide the therapeutic decision and to exclude associated thoracic injury.

This report has the inherent limitations of a single-case observation, including the absence of radiographic follow-up beyond the initial admission due to patient non-adherence, which limits objective assessment of radiological healing despite the favorable clinical course.

Conclusion

Medial clavicle fractures can closely mimic sternoclavicular dislocation both clinically and on standard radiographs. CT with 3D reconstruction is a valuable and, in equivocal cases, indispensable tool, allowing precise characterization of fracture displacement and comminution, exclusion of true joint dislocation, detection of associated thoracic complications, and appropriate guidance of therapeutic strategy.

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Declarations

Informed consent: Written informed consent was obtained from the patient for publication of this case report and accompanying images.

Conflict of interest: The authors declare no conflict of interest.

Funding: None.