Upper limb deep venous thrombosis following a simple clavicle fracture

Andy Tanagho, Tarek ElGamal, Sameh Ansara

ABSTRACT

Introduction: Fracture of the clavicle is a common injury, accounting for 5–12% of all fractures and up to 44% of injuries of the shoulder girdle. About 70–80% of these fractures are in the middle third of the clavicle [1]. Damage to neurovascular structures associated with closed fractures of the clavicle due to blunt trauma is rare and more frequently related to penetrating injuries. The usual mechanisms of injury include fall on an outstretched hand or on the point of the shoulder and direct or indirect trauma associated with contact sports [2]. Literature about the incidence of deep venous thrombosis in upper limbs in orthopedic practice is limited [3]. This case report presents a case of upper-extremity deep venous thrombosis following conservative treatment of an acute clavicular fracture. Case Report: A 50-year-old female was presented with a fractured left clavicle after a high-velocity motorcycle accident. At presentation, there were no associated injuries and she was intact neurovascularly. X-ray showed a middle third left clavicle fracture which was treated conservatively in a sling. After 17 days of injury, the patient was again presented with acute discomfort and swelling of the left upper extremity. The patient had no risk factors for venous thromboembolism. However, a deep venous thrombosis was clinically suspected. Doppler ultrasonography confirmed thrombotic occlusion of both axillary and basilic veins. Anticoagulation therapy was initiated and continued for a total of three months. At three months follow-up, the fracture healed successfully and the swelling completely subsided. Conclusion: We conclude that a high index of suspicion is necessary to rule out possible vascular lesions in cases of high-energy blunt trauma to the shoulder associated with clavicular fracture. Treating it would prevent a potentially fatal pulmonary embolism.

Keywords: Deep venous thrombosis (DVT), Clavicle, Axillary vein thrombosis

INTRODUCTION

Fracture of the clavicle is a common injury, accounting for 5–12% of all fractures and up to 44% of injuries of the shoulder girdle. In sports related fractures, it is even the most frequent fracture. About 70–80% of these fractures are in the middle third of the clavicle [1]. Damage to neurovascular structures associated with closed fractures of the clavicle due to blunt trauma is rare and more
frequently related to penetrating injuries. The usual mechanisms of injury include fall on an outstretched hand or on the point of the shoulder and direct or indirect trauma associated with contact sports [2]. Little evidence exists on the incidence of axillary vein thrombosis in orthopedic practice. It is considered an uncommon clinical event with considerable potential for morbidity [3]. This article presents a case of upper-extremity deep venous thrombosis following conservative treatment of an acral clavicular fracture.

**CASE REPORT**

A 50-year-old fit and active female was presented to our emergency department with isolated left shoulder pain after falling from motorcycle at a speed of approximately 50 mph. There was tenderness over the left clavicle and she had difficulty in moving her left shoulder. There was no sensory or motor deficit in the upper limb. Ipsilateral peripheral pulses were palpable, with good capillary filling. X-ray of the left shoulder showed a simple middle third clavicle fracture (Figure 1). The arm was supported in a broad-arm sling for conservative treatment of the fracture.

After a week follow-up, the patient remained intact neurovascularly and a check X-ray was done which was satisfactory. As a routine practice with conservatively treated clavicular fractures, the patient was allowed to mobilize the elbow actively. After 10 days, she presented to accident and emergency department with acute discomfort and swelling of the left upper extremity.

According to the thromboprophylaxis assessment protocol done for all orthopaedic admissions in our hospital, the patient had no risk factors for venous thromboembolism (age <60, body mass index <30 kg/m², no medical co-morbidity, not on thrombogenic medication, no personal history of thromboembolism and no anticipated significantly reduced mobility). Deep venous thrombosis was suspected clinically. Doppler ultrasonography showed thrombotic occlusion of the axillary and basilic veins with no flow in that segment (Figure 2).

Anticoagulation therapy was started with low molecular weight heparin then warfarin for a total period of three months. After six weeks follow-up the patient showed clinical union at the fracture site and regained range of motion of the left shoulder. Upper limb swelling has noticeably improved and radiography showed satisfactory union (Figure 3). Considering the uncommon presentation of upper limb deep venous thrombosis, the patient was finally reviewed and discharged after a period of three months.

**DISCUSSION**

Middle third fractures of the clavicle account for 70–80% of clavicular fractures [1]. The usual mechanisms of injury include fall on an outstretched hand or on the point of the shoulder and direct or indirect trauma associated with contact sports [2]. Approximately, 10% of all cases of deep venous thrombosis involve the upper extremities, resulting in an annual incidence of 0.4 to 1 case per 10,000 people.

The classic presentation of upper extremity deep venous thrombosis is acute discomfort, arm swelling, and risk factors such as vigorous arm exercise, an implanted
central venous catheter or pacemaker, or a history of deep venous thrombosis. Oedema, discoloration, and visible venous collaterals are also typical signs [4]. A high degree of clinical suspicion is necessary to detect deep venous thrombosis from blunt trauma. A Doppler ultrasound can throw light on the degree of vascular damage or occlusion, the level of injury, the involvement of the artery and vein and any external compression due to hematoma [5]. In this case, there were no risk factors for deep venous thrombosis. She sustained a direct trauma to the left clavicle. The fracture was treated in a broad-arm sling and antithrombotic medications were given for three months and regular follow-up appointments were arranged. We postulate that high-velocity trauma, which can occur in a road traffic accident, may include direct blunt injury to the clavicle resulting in fracture of the middle third. In these circumstances, displaced sharp bone fragments can cause intimal damage [5–7]. Early recognition of these rare lesions can guide the physician in planning the appropriate treatment that could prevent a fatal pulmonary embolism [8]. There is little evidence in literature about the incidence of deep venous thrombosis in upper limbs in orthopedic practice [8].

CONCLUSION

We conclude that a high index of suspicion is necessary to rule out possible vascular lesions in cases of high-energy blunt trauma to the shoulder associated with clavicular fracture. Treating it would prevent a potentially fatal complication.

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Author Contributions

Andy Tanagho – Substantial contributions to conception and design, Acquisition of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Tarek ElGamal – Substantial contributions to conception and design, Acquisition of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Sameh Ansara – Substantial contributions to conception and design, Acquisition of data, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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