Screw migration in a 14-year-old boy with hip osteotomy. A case of a rare cause of upper thigh hematoma

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Abstract

Soft tissue injury due to orthopedic hardware migration is an uncommon complication. However particularly patients who have routine physical therapy sessions for extremity contractures are at risk for vascular injury in the setting of migrated screws. Ultrasound is an efficient modality to evaluate migrated screws and adjacent soft tissue structures. As a consequence of repetitive trauma a migrated screw would eventually result in injury. Herein a case of upper thigh hematoma due to screw migration in a patient with hip osteotomy is reported.

Keywords: screw migration; hematoma; ultrasound

Introduction

Hip dysplasia is a serious cause of patient comorbidity. Children with cerebral palsy (CP) may have normal hip joints at birth however as a consequence of spasticity and contractures they may develop acetabular dysplasia, and femoral head subluxation [1,2]. Since the primary cause of hip dysplasia is spasticity, they may suffer from pain and nursing difficulties [1,2]. It may be challenging to perform daily routine activities in children with CP due to extremity contractures. Various procedures can be considered in the management of these patients. Schanz osteotomy is a palliative hip surgery particularly performed in children with CP in order to reduce soft tissue tension and improve patients' life quality. Basically, the procedure is performed with a plate, and several screws [1,2]. A screw may penetrate through the adjacent soft tissue in time. Vascular injury, as a consequence of or-

thopedic hardware migration, has been reported in the literature [3,4]. However, in these reports, the condition affects the elderly patients who had previous surgery for hip replacement or fracture. Late injury of deep femoral vessels after an orthopedic surgery is an uncommon complication.

Herein, a 14-year-old boy with CP treated by Schanz osteotomy who suffered from deep femoral vascular injury due to screw penetration is presented.

Case report

A 14-year-old boy was admitted to emergency room (ER) with a 1-day history of soft tissue swelling affecting the right proximal upper thigh. The patient had CP and underwent Schanz osteotomy procedure 4 years ago due to severe hip dysplasia. The physical examination revealed a non-pulsatile, soft tissue mass located at the medial aspect of right upper thigh. There was no sign of infection or subcutaneous ecchymosis. He had routine physical therapy sessions for extremity contracture and one session had been performed the day before admission to ER. Ultrasound examination revealed a large hematoma (sized 1.4x3x6 cm) adjacent to four screws that penetrating through the course of deep femoral vessels (fig 1a, 1b). There was no sign of pseudoaneurysm or flow turbulence within the hematoma that might indicate

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Fig 1. (a) Longitudinal sonogram of the right thigh demonstrates two migrated screws (arrows) from the bone cortex through the subcutaneous soft tissue and the associated hematoma (H). Sonogram could not reveal all four migrated screws due to oblique arrangement. (b) The radiograph clearly demonstrates four migrated screws. (c) Color Doppler sonogram demonstrates a small caliber vessel (arrow) adjacent to the migrated screw which could be the origin of hemorrhage. Spectral analysis reveals venous flow. (d) Longitudinal sonogram of the asymptomatic left thigh demonstrates substantially three migrated screws (arrows) with no evidence of hematoma.

active extravasation. Subsequently, Doppler ultrasound examination identified a small caliber vein located in the course of a migrated screw (fig 1c). The distal tip of the screw was found within the hematoma cavity. The patient had bilateral hip surgery and three screws penetrating the soft tissue were also seen in the asymptomatic left thigh without evidence of hematoma (fig 1d). Further evaluation and control US examination were recommended, however patient was lost on follow-up period.

Discussions

Screw related complications are rarely encountered, yet can be more frequently seen after spinal surgery [5]. Aortic injury following spinal surgery is an unfortunate complication. Vascular injury is a serious condition and any vascular structure that adjacent to a migrated screw is at risk for injury. Although rare, migrated screws may damage femoral vascular tree [3,4]. Early diagnosis is crucial, since large hemorrhage may cause ischemia. Schanz osteotomy is a palliative hip surgery primarily performed in children with CP to improve patients' life quality. A plate and several screws are used to prevent femoral head migration and reduce soft tissue stress [1,2]. In the setting of screw migration through the deep femoral soft tissue, the patient is at risk for vascular injury. Plain graphs may demonstrate screw loosening or migration, yet there is insufficient data regarding the adjacent soft tissue. CT provides better visualization of the vessel lumen, however beam hardening artifacts related to orthopedic hardware is a major drawback. On the other hand, ultrasound is an inexpensive, portable, radiation free and fast modality that can be utilized as an initial imaging modality in the setting of screw migration. There are several articles reporting that ultrasound

is a safe and accurate method for the assessment of screw penetration [6,7]. Herein reported case also supports the evidence that ultrasound is an efficient modality to evaluate migrated screws and adjacent soft tissue.

The reported patient had routine physical treatment sessions for both lower extremity contractures. Manual movements of the leg may result in vascular injury in case of migrated screws. Immobile patients such as children with CP have atrophic muscles. Therefore any hemorrhage may rapidly increase in size, due to lack of adequate muscle strength. In the setting of screw penetration, particularly in patients with significant muscle atrophy, ultrasound should be modality of choice in evaluating the position of the tip of screw and the adjacent soft tissues for possible future injury and hemorrhage.

In conclusion vascular injury due to orthopedic hardware migration is an uncommon complication, yet it may be underestimated. Ultrasound is an efficient modality to evaluate migrated screws and adjacent soft tissue structures.

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