



Post-traumatic fracture-dislocation of the humeral head with intrathoracic migration: A case report

Fracture-dislocation post-traumatique de la tête humérale avec migration intra thoracique: A propos d'un cas

Rym Hamed¹, Aymen Zoubli¹, Hanène Ghazali², Imen Mekki¹, Amel Maaref¹, Siwar Jerbi¹

1. Emergency Department- Charles Nicolle Teaching Hospital- Tunis-Tunisia- Faculty of Medicine of Tunis
2. Emergency Department- Ben Arous Regional Teaching Hospital- Tunis – Tunisia- Faculty of Medicine of Tunis

ABSTRACT

Introduction: Severe trauma is a frequent condition encountered in Emergency department (ED) in which vital prognosis can easily be engaged. This condition could be responsible for unusual injuries occurrence. Emergency physician must be aware of these situations where adequate management is urgently required. We report a case of a 45-year-old patient who was admitted to the ED after a high velocity road traffic accident resulting in multiple injuries and fracture dislocation and migrating humeral head into intra thoracic position.

Observation: We report the clinical case of a patient aged 45 years without medical history admitted to the ED after being involved in a high-velocity road traffic accident. On clinical presentation, the patient was dyspneic and desaturated on ambient air room, he presented moreover clinical signs of blunt right shoulder trauma and deformation of the 2 thighs. Final screening of injuries by radiological and a tomographic exams retained a polytrauma status with fracture dislocation and migration of humeral head, homolateral hemothorax and double femur fracture. Patient was managed by multidisciplinary surgical approaches

Discussion et conclusion: We illustrated by this case a very rare post trauma condition represented by a fracture dislocation of the humeral head resulting in an intrathoracic migration and a homolateral hemothorax. This diagnosis was reported only a few times by the literature within last decades and management suffers from lack of treatment guidelines which remain team-dependant. At the very early stage of management and before surgical step, emergency physician must be aware of the possibility of this clinical condition with evolution into some threatening clinical presentations with specific management.

Key words : Emergency, trauma, fracture, humeral head, dislocation, migration, localization, unusual, hemothorax

RÉSUMÉ

Introduction: Le traumatisme sévère est une pathologie fréquente aux urgences pouvant engager le pronostic où la vitesse peut entraîner des lésions inhabituelles et parfois fatales dont la prise en charge adéquate reste un challenge pour le médecin urgentiste. Nous rapportons le cas d'un patient victime d'un traumatisme de haute vitesse avec dislocation de la tête humérale en intra thoracique.

Observation: Nous rapportons le cas d'un patient âgé de 45 ans sans antécédents qui a été admis aux urgences dans les suites d'un accident de la voie publique de haute vitesse. Le bilan clinique lésionnel a objectivé une dyspnée avec désaturation et une déformation de l'épaule droite ainsi qu'une déformation des 2 cuisses sans effraction cutanée. Le patient était conscient et non intubé. Le bilan lésionnel morphologique final a objectivé une fracture dislocation de la tête humérale droite avec migration intrathoracique homolatérale et hémithorax associé non compressif ainsi qu'une double fracture fermée des fémurs. La prise en charge a été chirurgicale multidisciplinaire.

Discussion et conclusion: Ce cas illustre une situation clinique inhabituelle d'une migration post-traumatique de la tête humérale après dislocation et fracture. Il s'agit d'une condition rare avec uniquement une trentaine de cas rapportés dans la littérature depuis des décennies. La physiopathologie et la prise en charge restent dépendantes des équipes. Cette situation rare demeure un challenge pour le médecin urgentiste à la phase précoce de la prise en charge afin de ne pas méconnaître un hémithorax associé

Mots clefs: urgences, traumatisme sévère, fracture, humérus, migration, localisation, inhabituelle, hémithorax

Correspondance

Rym Hamed

Emergency Department- Charles Nicolle Teaching Hospital- Tunis-Tunisia- Faculty of Medicine of Tunis

Email: rymhamed@yahoo.fr

INTRODUCTION

Major trauma is a frequent worldwide misleading cause of mortality especially in young patients. In some but rare conditions with high velocity criteria, clinical post-traumatic anecdote features may be described and are highly associated with rapid mortality with immediate prognosis impairment. Post-traumatic dislocation of humeral's head and intra thoracic migration is possible but only few cases were described in the literature. West and al first reported a case of fracture dislocation and migration in intra thoracic position in 1949 [1].

Urgent need of multiple steps guided strategy of diagnosis process management in this mostly life-threatening situation and both immediate and further adequate therapeutic solutions to provide are meanwhile needed and challenging for every emergency physician and trauma team. The therapeutic management enrolled in a trauma care system process with both medical and rapid adapted orientation to a multidisciplinary trauma surgery ward could improve final prognosis.

CASE REPORT

We report the case of a 45-years old patient brought to the emergency department by the emergency mobile service following traffic road accident where he was a front passenger wearing a seat belt. High energy trauma velocity circumstances and ejection were reported.

On arrival, Glasgow Coma scale was 15 with no visible cranial impact. Clinical features associated a blunt thoracic trauma with polypnea equal to 20/min and low pulse oximetry evaluated to 88% on air. Nor subcutaneous emphysema neither tympanism on auscultation abnormalities defended an immediate chest tube placement. Hemodynamically, patient presented a blood pressure at 110/76 mmHg with and was tachycardic at 110/min. Preload vascular signs were normal and no features of tension pneumothorax were clinically identified. Bilateral thighs deformation was noticed on initial clinical survey and patient was immobilized. No clinical features of hypotension or shock were noticed at initial assessment. Patient was immediately oxygenated using face mask with 8 l/min to achieve an oximetric pulse target of 95%. Moreover, analgesia was underwent using titrated intravenous opioids (morphine agents) targeting visual analogic pain scale under 3. At the same time of optimization of oxygenation and hemodynamic settings, thigh-fractured sites were re-axed and immobilized. We could have a first bedside chest pulmonary imaging (Figure 1) immediately showing a hemothorax. Finally, patient underwent a whole-body tomography when fully stabilized and optimal analgesia initiated.

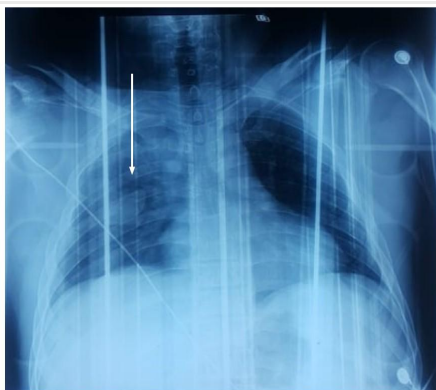


Figure 1. Chest X ray with fracture of the right humeral head and migration on ipsilateral hemithorax over fractures ribs

The whole-body tomography had immediately noticed a hemothorax and a dislocation with migration of right head humeral into homolateral intrathoracic position as shown in figure 2.

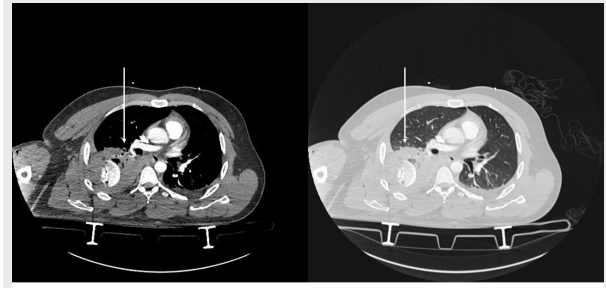


Figure 2. Fragment of the right humeral head after migration in intrathoracic position and secondary hemothorax on computed tomography

Double femur fracture was although been showed by X-Rays witnessing the high mechanism of the trauma (Figure 3) and fractures were immobilized. Patient was immediately transferred to the surgery ward to a multidisciplinary surgical approach with drainage and removal-replacement plasty of the humeral fragment head.

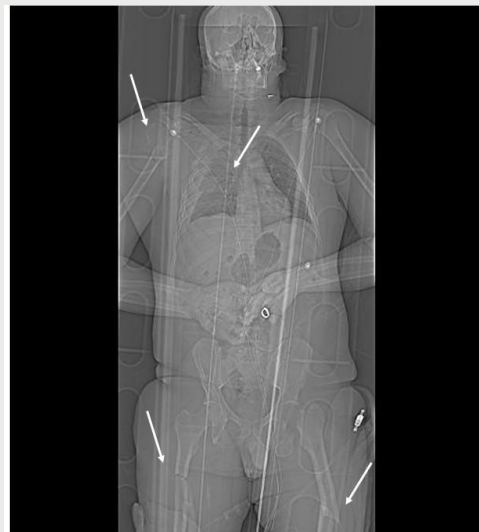


Figure 3. Scout X ray showing double femur fracture, fracture of the right humeral head and right ribs fractures with ipsilateral hemothorax

DISCUSSION

Post-traumatic fracture-dislocation and intra thoracic migration of humeral head is an extremely rare condition described in the literature. It was firstly described by West and al in 1949 and only less than 30 cases are nowadays reported within past half-century [1,2].

High velocity in young patients was the most correlated to this unusual migration of humeral's head as shown by the review of the literature presented, but in some cases, mechanism is common especially in older patients. The real mechanism remains very uncertain but could be described as a forced abduction of the shoulder driving dislocated humeral head or fragments of humeral head in the area of fractured ribs [2,3].

Migration of humeral fragments of the fractured was mostly described to occur in the ipsilateral hemithorax, but in some cases, migration is contralateral to the fractured side on the neck [4]. In one case reported migration was

or the retroperitoneal position [5].

The challenge at the emergency setting is not to misdiagnose both diagnosis and respiratory post-traumatic distress as an isolated hemo-pneumothorax and misplace a chest tube when not needed.

Classic Chest radiography could be insufficient in most cases and misdiagnose some difficult features [6,7]. Ultrasonography is a very interesting diagnosis tool nowadays in this context and could be helpful especially at the very early stage of diagnosis and management by eliminating any pneumothorax or hemothorax associated. This tool could thus be proposed as mandatory in the diagnosis process for all emergency physicians in the context of post-traumatic respiratory distress.

Review of the literature highlights awareness of every emergency physician towards combined proximal humeral fracture and ipsilateral ribs fracture to undergo a computed thoracic tomography not to misdiagnose migration of fragments of the humeral head into thoracic position [2].

Moreover, rapid evolution of the clinical condition and mechanical ventilation urgent need in some circumstances could impair clinical situation and lead to secondary pneumothorax.

Given the diagnosis of respiratory or circulatory distress secondary to tension hemo pneumothorax, a chest tube should be inserted at the first step of management and more specialized multidisciplinary surgical approach is then needed.

Until 2022, no clear guidelines for surgical treatment are yet commonly proposed as shown in the review of Frodl et al. Surgical pathways of treatment proposed over the few cases in the literature holds multidisciplinary techniques enrolling video thoracoscopy, drainage and arthroplasty in a multiple steps. In some rare cases, intra-thoracic humeral head position was respected [8].

Possible described immediate risks are hemothorax or pneumothorax with respiratory and hemodynamic distress, aggravated lesions of the pulmonary tissues or rupture bronchus, vascular injury of the brachial plexus and secondary rotator cuff impairment and avascular necrosis of the humeral head [9].

CONCLUSION

Dislocation and migration of humeral head into thoracic position is unusual and rare described over the literature. Mechanism of migration remains uncertain and surgery is the most frequent described attitude nevertheless no clear guidelines are yet proposed and treatment remains team dependent.

REFERENCES

- West E.F., Intrathoracic dislocation of the humerus, *J Bone Joint Surg Br* 1949;31(B)1:61-62
- A. Frodl et al. Fracture dislocation of the humerus with intrathoracic humeral head fragment – A case report and review of the literature. *Trauma Case Rep* 2022; 37: 100592-7
- Abbott GF, Gaissert H, Faberman RS. Contralateral intrathoracic migration of humeral head fracture dislocation. *AJR Am J Roentgenol* 1999;172:1403-4
- Hardcastle PH, Fisher TR. Intrathoracic displacement of the humeral head with fracture of the surgical neck. *Injury* 1981;12:313-315
- Wirth MA, Jensen KL, Agarwal A, Curtis RJ, Rockwood CA Jr. Fracture-dislocation of the proximal part of the humerus with retroperitoneal displacement of the humeral head: A case report. *J Bone Joint Surg Am* 1997;79:763-6
- Bannour I, Meksi Y, Fodha M, Ouaz F, Haddad F, Majdoub A. Blunt chest trauma : clinical difficulties and limitations of radiological examinations. *Tunis Med* 2017 ; 11 :972-975
- Omri M , Bouaouina H, Kraiem H et al. Missed injuries in pre-hospital trauma patients. *Tunis Med* 2017;5: 336-340
- N. Du Plessis, S. Rajendran, S.A. Naqi, R. Cahill, Intrathoracic fracture-dislocation of the humeral head. Is removal of the humeral head necessary? *BMJ Case Rep.* 2012;2012:007478-2
- Nicholas Hayes, John White, Peter Lillie, Jayme S Bennetts, Chen Gang Tu & Gregory I. Bain. Intrathoracic shoulder dislocation causing rupture of the right main bronchus : *Arch Orthop Trauma Surg* 2020; 140:443–447