Luxatio erecta, an inferior luxation of the glenohumeral joint
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Clinical History:
A 45-year-old woman arrived at the emergency room after a fall. She held her right arm in an upright position. When examined she was unable to move her arm actively. Clinical examination revealed no signs of neurological or vascular injury.

Imaging Findings:
On radiography there was a dislocation in the right glenohumeral joint with the caput humeri in inferior position of the glenoïd. There was an associated avulsion fracture of the tuberculum majus with a impaction trauma (Fig. 1, 2). The dislocation was reduced with traction-counter traction after an intra-articular injection of lidocaïne HCL 1% in the glenohumeral joint. The avulsion fracture is clearly visible on the radiography of the reduced shoulder (Fig. 4). In the weeks after the luxation she developed a “frozen shoulder” in spite of active physiotherapy. MRI of the right shoulder revealed a combined avulsion and impaction trauma of the greater tuberosity. High signal in the supraspinatus tendon was seen in keeping with tendinopathy (Fig. 3). On this plain MRI, labral tears could not be assessed properly. After a follow up of five months she had a range of motion of 90 degrees of anteflexion and 15 degrees of exorotation.

Discussion:
Luxatio erecta is a rare and inferior luxation of the glenohumeral joint. It comprises only 0.5 % of all shoulder dislocations [1]. Clinical presentation is typical with the arm in upright position and the elbow flexed with the hand resting on the head. An inferior dislocation is caused by a specific injury, as result of either a direct or an indirect mechanism. Indirect being a fall with the upper arm in extension which levers the humerus over the acromion resulting in an inferior dislocation of the humeral head [2]. Direct being hyperextension with traumatic dislocation or violent traction [3-4]. In literature less then ten cases of patients with bilateral dislocation have been reported. The mechanism consists of high-energy trauma or bilateral hyperabduction of the stretched upper arms [3-4].

The first choice of imaging modality is a plain X-ray of the shoulder in two directions. This shows a typical image of the humerus in abduction with the humeral head projecting over the glenoïd or alternatively, caudally of the glenoïd. Review of literature shows the dislocation elicited either a fracture or a rotator cuff tear in up to 80 % of cases [3, 5]. A fracture of the tuberculum majus is most frequent. Fractures of the glenoïd rim and acromion and the scapular spine have been described. With multidetector computer tomography it is possible to evaluate any fracture. However since this type of shoulder dislocation is associated with rotator cuff tears, often an MRI is performed to assess the shoulder joint.

MRI can in addition show labral tears, bone marrow oedema and small impressions of the humeral head. Rotator
cuff injuries include full or partial thickness rupture of the supraspinatus and infraspinatus, subscapularis or the teres minor tendon. Furthermore inferior glenohumeral ligament (IGHL) lesions of both the anterior and posterior portions have been found on MRI. The combined IGHL injury may be specific for an inferior dislocation [6]. Besides ligamentous injury also neurologic injury has been described in up to 60 % of patients [1, 5]. Sometimes vascular injuries can be seen and these are more consistent with an inferior dislocation than any other type of glenohumeral luxation.

Therapy with reducing the inferior glenohumeral dislocation has been described in several ways, the standard being traction-counter traction. This can be done with either intra-articular lidocaïne or conscious sedation anaesthetics [1].

**Differential Diagnosis List:** Inferior dislocation (luxatio erecta) of the glenohumeral joint, Posterior glenohumeral luxation, Multidirectional instability / subluxation inferiorly

**Final Diagnosis:** Inferior dislocation (luxatio erecta) of the glenohumeral joint

**References:**

Rockwood CA Jr, Green DP (2009) Inferior dislocation of the glenohumeral joint. Fractures in adults, 7nd ed
Description: Antero-posterior view of the right shoulder with an inferior dislocation of the glenohumeral joint with the humerus held upright. Origin: Willemse MEB, Department of Radiology Deventer Ziekenhuis, The Netherlands
Figure 2

Description: Lateral view of the right shoulder with an inferior dislocation of the glenohumeral joint. A fracture of the greater tuberosity is shown (arrow). Origin: Willemse MEB, Department of Radiology, Deventer Ziekenhuis, Deventer, The Netherlands
Description: Antero-posterior view of the right shoulder after reduction with the avulsion fracture of the tuberculum majus clearly visible (arrow). Origin: Willemse MEB, Department of Radiology, Deventer Ziekenhuis, Deventer, The Netherlands
Figure 4

Description: Coronal T1-weighted image of the right shoulder shows the impaction trauma as well as the avulsion fracture of the tuberculum majus (arrow). Origin: Willemse MEB, Department of Radiology, Deventer Ziekenhuis, Deventer, The Netherlands
Description: Coronal fatsuppressed T2-weighted image of the right shoulder shows an impaction fracture of the greater tuberosity and associated bone marrow oedema (arrow). Tendinopathy of the supraspinatus tendon without signs of a rupture (arrowheads). Origin: Willemse MEB, Department of Radiology, Deventer Ziekenhuis, Deventer, The Netherlands