

## CASE REPORT

# BILATERAL INFERIOR DISLOCATION OF THE PROXIMAL HUMERUS (LUXATIO ERECTA) IN A PILATES SESSION: A CASE REPORT

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## ABSTRACT

Defined by partial or total loss of joint congruence, the most frequent dislocations are glenohumeral. Of these, the most uncommon have an inferior presentation, being even rarer if bilateral. Usually associated with little or no neurovascular loss, it has a typical presentation of "raised arms", making it impossible to reduce without sedation in the operating room, due to pain and difficulty in reduction maneuvering and patient cooperation. Here we present the case of a patient with luxatio erecta after a pilates session, who was well managed in the emergency department of a private hospital, with loss of range of motion and neurovascular alterations compatible with the available literature.

**KEYWORDS: LUXATIO ERECTA, INFERIOR DISLOCATION, SHOULDER, PILATES, HUMERUS**

## INTRODUCTION

Dislocation is described as the phenomenon of total or partial loss of joint congruence, with the shoulder being the most frequent in the human body, with about 45% of all cases<sup>1</sup>. It was first described in 2000 BC. by Edwin Smith and later by Hippocrates, in 450 BC, the latter with more detail in his account<sup>1</sup>.

It can occur for anterior, posterior, inferior and superior (theoretical). Inferior dislocation, also known by the term "luxatio erecta", is the type with the rarest real occurrence (only 0.5% of cases), it was first described by Middeldorf and Schram in 1859<sup>2,3</sup>. Its bilateral presentation is even rarer, with no percentage report in the literature<sup>3,4</sup>.

It does not usually have a specific prevalence of age, and can occur in any age group from 3 to 75 years<sup>2</sup>. The clinical picture is characteristic, with the patient presenting with severe acute pain, being in the classic "arms raised" position<sup>1,2,3,4</sup> (shoulder abduction between 100 and 160 degrees, elbow flexion around 90 degrees and full pronation of the forearm)<sup>1</sup>, almost always with the forearm resting on the head or the contralateral hand holding the affected arm<sup>5</sup>. It is often possible to palpate the head of the humerus in the axillary or anterior region of the thorax<sup>3</sup>.

The causes or mechanisms of trauma can vary from the direct or indirect mechanism, the latter being more frequent. The first one occurs when a great load is sustained (sudden or not), with rupture of the inferior glenohumeral ligaments and the joint capsule, and the association with

rotator cuff tears and/or fracture of the greater tuberosity of the humerus is common<sup>1,3</sup>.

The second, described by Freudlinch (1983)<sup>4</sup>, occurs through a mechanism of hyperabduction of the shoulder, not being related so much to the energy of the trauma, but rather to the position of the arm at the time of the trauma. This exacerbated movement impacts the proximal third of the humerus against the acromion, generating a leverage force that moves the humerus to the lower region. This mechanism can lead to rotator cuff injury, tearing of the middle and inferior glenohumeral ligaments, and the inferior border of the joint capsule<sup>1</sup>.

The pectoralis major muscle is responsible for maintaining the erect position of the humerus. While the long portion of the triceps prevents posterior dislocation and the superior glenohumeral ligament prevents anterior dislocation. Thus, the humeral head is pulled downward by the teres minor and latissimus dorsi muscles<sup>1,3,4</sup>.

The treatment is urgent, with closed reduction being performed in a surgical center under anesthesia (plexus block + sedation), in some there is difficulty in direct reduction, it is necessary to first obtain the change from inferior dislocation to anterior dislocation and from there classic maneuvers were used for reduction<sup>7,8</sup>. There are cases that do not accompany complications such as ligament, neurovascular and muscle injuries, especially in cuff injuries in young patients, and direct surgical repair is chosen in a time to avoid morbidities and accelerate the patient's recovery<sup>7</sup>.

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This article seeks to present a distinct case of luxatio erecta in order to compile the report and its association with the common practice of Pilates in elderly patients, which even under supervision, can lead to accidents and serious complications.

### CASE REPORT

Male patient, MMT, 85 years old, was admitted to the emergency room of a private hospital in November 2021, brought by firefighters without trauma protocol, after indirect trauma to the shoulders during a pilates session.

The patient reports that he was in the prone position (ventral decubitus) on a pilates table, strengthening the upper limbs with a spring, with guidance and close monitoring by a physical therapist, when it escaped from both hands, resulting in chest trauma on the table with abducted upper limbs.

On physical examination, he was in a classic position with his arms raised, bilaterally, with his hands holding the contralateral forearms. He complained of intense pain on any attempt to manipulate the upper limbs. On palpation, the humeral head was felt in the bilateral axillary region. There were no neurovascular changes on admission.

A bilateral AP shoulder x-ray was taken, as shown below.



Figura 1 - radiografia da admissão

He was instructed on the urgency of the case, the condition and possible complications, and closed reduction in the operating room was chosen, after waiting the time requested by the anesthesiologist for fasting, despite the orientation of the urgency of the case.

In the operating room, a traction-countertraction maneuver was performed, obtaining the anterior dislocation and from there, a Spaso technique was performed for reductions. Fluoroscopic control with scopy showed bilateral reduction, so immobilization was applied in bilateral Velpeau bandage.

Below are the control x-rays after the patient was released from the Post-Anesthetic Recovery Room (PAR), which, per hospital protocol, were not performed in the operating room.



Figure 2 - AP radiograph - post reduction control, right side



Figure 3 - scapular lateral radiograph - post-reduction control, right side



Figure 4 - AP radiograph - post reduction control, left side



Figure 5 - X-ray in scapular profile - post-reduction control, left side

The patient was followed up at our service for 3 months.

On the first return visit with 13 days of evolution, he presented with active elevation of 145°, active external rotation (ER) of 50° and internal rotation (IR) in the lumbar, negative hornblower's sign in the right shoulder, and active elevation of 30°, passive 160° with crepitus, active ER 10° and IR in lower thoracic, positive lag sign in left shoulder.

He had a control x-ray with glenohumeral reduction,

head elevation on the left and rotator cuff arthropathy on the right. Motor and proprioceptive physical therapy was oriented, with an option for conservative treatment of his injuries, and an MRI was requested for a better evaluation.

On the second return visit, 3 months after reduction, he reported improvement in the condition on the right, with persistence of pain on the left. On physical examination, on the right, he had active elevation of 155°, active ER 50°, thoracic-lumbar IR, positive jobe with reduced strength, no pain, positive infraspinatus tests with reduced strength, no pain, hornblower and gerber negative. The left had active elevation of 50°, passive elevation of 160° with crepitus, RE 40°, thoracolumbar IR, positive jobe, positive infraspinatus test with loss of strength and mild pain, negative hornblower and gerber.

Patient underwent infiltration with Triancil and local anesthetic, being instructed to remain with physiotherapy and return after 2 months. Patient did not return and we were unable to contact the patient and family.

### CASE DISCUSSION

We present the case due to its peculiarity of occurrence in a pilates session, not being affected by load or high energy traumas. Patient with age above the standard presented in the reviewed articles (85 years old, against a maximum of 75 years old in the other articles)<sup>2,3,4,5,6,7,9,10</sup>. Something that we believe is due to the fact that patients have a great increase in life expectancy since the publications and updates of the age groups.

A rare entity, luxatio erecta presented in this case with a clinical picture and classic trauma mechanisms, with elevated limbs and hyperabduction trauma (indirect mechanism)<sup>1,2,8,9,10</sup>. Not presenting nerve or vascular lesions, going against some presentations cited in articles read<sup>5,6,7</sup>.

In his treatment, closed reduction was chosen in a surgical center under anesthesia (brachial plexus block) and sedation, as recommended by several authors<sup>2,3,4,7,8</sup>.

In the follow-up of the patient, his condition improved, with evolution in his physiotherapy sessions, however, the patient probably already had a rotator cuff (RC) injury, due to rotator cuff arthropathy, which would hardly have been established in such a short time of injury.

In line with the literature<sup>2,3,4,6,8,9,10</sup>, the patient did not have a large reduction in his shoulder range of motion, loss of sensitivity or major changes in strength. The patient had no new complaints during the follow-up period, with no associated vascular or skin changes.

Unfortunately, we did not perform follow-up long enough to determine a substantial improvement in the patient's condition, who had major changes in the physical examination, greater on the left, something that made comparison with the literature difficult.

### CONCLUSION

With a rare presentation, we emphasize the importance of the article for the mechanism of trauma in an elderly patient,

requiring better follow-up and tracking of the patient, especially in pilates sessions, which appear to be simple, but can have severe complications such as the case mentioned.

We believe in the maxim "we only greet those we know", we emphasize the need for the report for better appreciation and knowledge of the orthopedic community about the unusual trauma condition and mechanism, in order to improve the recognition of the condition and management.

We hope that the article will also serve the relatively scarce database of the pathology and its presentations, contributing to its future studies and dissemination.

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