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COMPARATIVE ANALYSIS OF KINETIC RECOVERY IN ELBOW JOINT TRAUMA

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Abstract In the present paper, the aim is to carry out a comparative analysis in order to manage the therapeutic pathway in the post-immobilization period in trauma to the elbow joint in children. Due to the fact that this pathology is quite common and requires special attention to prevent the onset of joint stiffness that accompanies this trauma. We believe that this work will be a useful material due to the fact that it brings up to date elements of diagnosis, evaluation and kinetotherapeutic recovery.

Introduction

The elbow joint anatomically includes three joints, functionally, biomechanically, it is described as a single diarthrodial joint. The elbow stress is related to the other joints of the upper limb, namely the shoulder and the hand joint [3,4 p.197, 6].

The most common injuries to the elbow joint are dislocations and fractures, which can be comminuted and require reduction with the association of osteosynthesis material. Elbow dislocations may involve both bones of the forearm or only one (radial head most commonly - the other bone will fracture).

Causes: direct trauma (blow to the elbow); indirect trauma (falling on the hand with the forearm flexed).

Evolution: this dislocation has a reserved prognosis; it is rapidly reduced, the pain is difficult to recover from, the most frequent sequela being extension deficit.

Symptoms: pain, swelling, deformity of the region with prominent olecranon, incomplete extension and radiologically confirmed diagnosis.

Treatment: reduction of dislocation with/without anaesthesia; immobilisation 21 days in orthosis; physiotherapy.

Form:

- anterior dislocation involves fracture of the olecranon, requires surgical treatment;
- lateral dislocation, after direct trauma;
- divergent dislocation, ulna moves in one direction and radius in the other; tears the annular ligament; surgical treatment;
- radial head dislocation-appears in young children, lifted by hands or wrenched by hands. [1,8]

Elbow fractures:

a).Humerus fractures: distal epiphysis.

Shapes: ellipsoid dehiscence-appears in children; fractures with 2 or more closed or open comminuted fragments; fractures with or without displacement; intra- or extra-articular fractures.

Causes: direct trauma by crushing mechanism; indirect trauma by falling on hand or elbow in hyperflexion or extension.

Signs: classic signs, plus bruising of the elbow crease.

Treatment: reduction under anaesthesia-mobilisation in a plaster cast for 21-30 days or immobilisation in a brachio-antebrachial splint (3-10 days)-active immobilisation of the subantalgic elbow; physiotherapy treats secondary joint pain.

b) Ulna fractures: proximal epiphysis.

The most common is the fracture of the olecranon. Causes: direct trauma (local blow) or indirect trauma (hyperflexia or hyperextension of the elbow).

Olecranon fractures are fairly common. Although they usually occur on their own with no other injuries, they can also be part of a more complex elbow injury[9].

Signs: classic signs, plus antalgic position by supporting the forearm; on palpation the olecranon is elevated.

Treatment:

- orthopaedic-imobilisation in splint or brachio-antebrachial cast (10-21 days);
- surgical-osteosynthesis with wire, screw or rod.

c).Radius fractures: head and neck of radius.

An elbow fracture can take more than a year to heal completely, although most people recover within 3 months with proper treatment. The time it takes for a fractured elbow to heal depends on the type of fracture and whether it is treated non-surgically or surgically. [10]

Fractures of the distal radius cause morbidity in patients and result in loss of work capacity despite restoration of bone alignment and even if the fracture is anatomically healed. [5].

Causes: indirect trauma (fall on elbow or hand).

Signs: classic signs, plus possible interception of the motor branch of the radial nerve.

Treatment:

- Orthopaedic-plasty 7-28 days; complications-elbow brace;
- surgical (osteosynthesis of the head), rarely arthroplastic with prosthesis (replacement of the radial head);
- physiotherapy.

Kinesiotherapy - with role of increasing joint mobility, muscle strength, prehension and functional coefficient. [2, 4 p. 221-225].

Post-traumatic elbow recovery is divided into 2 main stages:

- Early recovery or recovery from periods of immobilization;
- Recovery after suspension of immobilisation.

Early recovery: regardless of how the elbow injury is treated after it has been mobilised, after 8-10 days recovery begins with the following goals:

a).recovery of tissue trophicity-method:

- application of electromagnetic waves to strengthen the fracture, wound healing, resorption of haematomas and suppression of muscle contractures;
- positioning of the upper limbs - avoid prolonged sloping position to prevent edema.

b).Maintain joint mobility in unaffected joints: shoulder, fist and fingers should be mobilised passively, passively-active and actively (especially the hand). At the shoulder: flexion, ABD and rotation. Fist: flexion/extension, ABD and ADD. For the hand and fingers, plasticine, rubber balls, rubber bands, elastic bands or various spring devices are used for active movements.

Recovery after suspension of immobilisation:

Objectives:

- Pain relief;
- Combat vasomotor and trophic disorders;
- Regain joint mobility;
- Increase muscle strength;
- To increase proprioceptive capacities in order to achieve ADLs.

[5, 7]

Aim and objectives of the study:

The aim of the study is to present a comparative analysis of elbow joint trauma recovery.

Research objectives:

- literature review on how to approach post-traumatic recovery at the elbow joint;
- to carry out a comparative analysis between two types of elbow trauma.

Materials and methods: In order to achieve the proposed objective, we will present two case studies, namely the physiotherapeutic recovery of two children aged 10-12 years who suffered a fracture of the elbow joint. Both cases were treated under similar conditions, the difference lies in the way of fracture reduction:

- the fracture in the 10-year-old child was reduced with osteosynthesis material ;
- the fracture in the 12 year old child was reduced surgically and plaster cast material.

If in the 10 year old child the physiotherapy recovery took place under normal conditions, with good results, respectively, range of motion, strength, ADL. The recovery was achieved in a short time 6 weeks (3 sessions per week) only physiotherapy.

Fig.no.2 case no. 1 - 10 year old child

Case number 2 took about 6 months of physiotherapy combined with physiotherapy and the results were not at all satisfactory. Contributing to this was a bone element probably detached during fracture reduction (surgery), this bone fragment of relatively small size, organised in the joint space limiting ROM.

Fig.no.2 case no.2 - 12 years old child

Results and discussions:

If in case 1 the recovery was achieved in optimal times, we can specify some aspects that were decisive in the therapeutic path: the osteosynthesis material

gives stability and increased safety to the bone element that has been reduced; also in this context the casting will be carried out with a faster dynamic due to the containment; even if the fracture is comminuted due to the age and the applied fracture reduction technique the casting process was carried out in optimal conditions. The advantage that the 10 year old child benefited from was that he entered the recovery programme with a better angulation than the 12 year old child.

In case no. 2 the first negative element is the plaster cast, which failed to provide a stable containment, which favoured bone elemet detachment; older age, the angulation from which it started was negative, the elbow joint being inflamed, painful and blocked, limiting ROM.

Conclusions:

- Fracture reduction in the elbow has a better chance of recovery if it is reduced with osteosynthesis material;
- Complications that may arise during the immobilisation period and afterwards may create post-traumatic conflicts that develop a pathogenic clinical picture with maintenance of an inflammatory status;
- The angle and ROM from which the recovery programme is started is decisive in the prognosis of the results obtained;
- A follow-up imaging investigation can prevent possible malalignment or retraction caused by the organisation of a bone element detached or displaced from the fracture site.

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