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### **Original Article**

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### ABSTRACT

*Objective:* This study aims at analyzing retrospectively the clinical-functional and radiographic results of surgical treatment of the terrible elbow triad, with at least 12 months of postoperative follow-up evaluating elbow function.

Methods: A group of patients for retrospective analysis from 2004 to 2015 was defined, in which 12 patients were studied. They underwent surgery due to fracture of the radial head, coronoid fracture, and elbow dislocation; they were evaluated by the Disabilities of the Arm, Shoulder and Hand (DASH) score, the degree of patient satisfaction, the degree of trauma energy, radiographic images, range of motion, and complications.

Results: There was a higher incidence of Regan and Morrey type II coronoid process fractures; in relation to the injuries, nine patients had deinsertion of the brachialis. Half of the patients suffered a fall from their own height as the mechanism of trauma. The extent of elbow flexion and extension averaged 126.6 and 24.1 degrees, respectively; the averages for pronation and supination were 64.1 and 62.0 degrees, respectively. All patients presented muscle strength of grade IV or V. The mean DASH score was 14.3, the mean pain score was 2.5, and a majority of the patients were satisfied with the treatment.

Conclusion: Despite the total loss of range of motion of the elbow, especially in extension, the treatment was satisfactory for most patients.

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### Palavras-chave: Fraturas do rádio Articulação do cotovelo Luxações Ortopedia

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### Tríade terrível do cotovelo. Avaliação do tratamento cirúrgico

#### RESUMO

Objetivo: Este estudo tem o objetivo de analisar, retrospectivamente, os resultados clínicofuncionais e radiográficos do tratamento cirúrgico da tríade terrível do cotovelo, com no mínimo doze meses de acompanhamento pós-operatório, avaliando a função do cotovelo. Métodos: Definimos um grupo de pacientes para avaliação retrospectiva no período de 2004 a 2015, no qual foram estudados 12 pacientes, submetidos a procedimento cirúrgico devido a fratura da cabeça do rádio, fratura do processo coronoide e luxação do cotovelo; sendo avaliados pelo escore Disabilities of the Arm, Shoulder and Hand (DASH), grau de satisfação do paciente, grau de energia do trauma, radiografias, arco de movimento e complicações. Resultados: Observou-se maior incidência de fraturas do processo coronoide do tipo II de Regan e Morrey; em relação às lesões, nove pacientes apresentaram desinserção do músculo braquial. Metade dos pacientes apresentou queda da própria altura como mecanismo de trauma. Os graus de flexão e extensão do cotovelo tiveram respectivamente as médias: 126,6 e 24,1 graus; e as médias em graus de pronação e supinação foram respectivamente: 64,1 e 62,0 graus. Todos os pacientes apresentaram grau de força muscular IV ou V. Obtivemos escore DASH médio de 14,3, a escala de dor teve média de 2,5, e a maioria dos pacientes se disse satisfeita com o tratamento.

Conclusão: Apesar da perda de amplitude total de movimento do cotovelo, principalmente em extensão, o tratamento mostrou-se satisfatório para a maioria dos pacientes.

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### Introduction

The terrible triad described by Hotchkiss is the combination of elbow dislocation associated with radial head fracture and coronoid process fracture; it is notoriously difficult to treat<sup>1</sup> (Fig. 1).

Load transmission and contact between the radial head and the capitulum of the humerus is constant, occurring at any angle of extension and flexion of the elbow and at any forearm rotation, being greater in extension.<sup>2-4</sup>

Radial head fractures comprise approximately 30% of all adult elbow fractures,<sup>5</sup> and are frequently associated with injuries to soft tissues and to the annular, medial, and lateral collateral ligaments, as well as with coronoid process fracture.<sup>2,6</sup>

This type of elbow injury occurs during a fall with the arm extended in supination, when valgus stress, axial load, and a posterolateral rotational force are generated, typically due to the energy of the trauma,<sup>2,7</sup> resulting in failure of the lateral collateral ligament complex (LCL) and sometimes of the medial collateral ligament (MCL) – the latter structure being the last one to be injured.<sup>8</sup>

Making a correct diagnosis is difficult, but paramount, as early treatment has a positive influence on prognosis.<sup>9</sup>

As a result of these injuries, the elbow becomes unstable and requires surgical intervention. Unfortunately, due to the complexity of the injury, conservative treatment is risky; the long-term complications include stiffness, pain, joint instability, and secondary arthrosis.<sup>10</sup>

The goal of surgical treatment of the terrible triad of the elbow is the restoration of humeroulnar and humeroradial

stability, thus facilitating the early onset of elbow movement in the postoperative period in order to reduce the probability of long-term joint dysfunction and stiffness.<sup>11</sup>

This study is aimed at evaluating retrospectively the clinical results of patients with the terrible triad of the elbow who underwent surgical treatment with at least 12 months of follow-up.

### Materials and methods

Patients with the terrible triad of the elbow, surgically treated in the period from 2004 to 2015 by two orthopedic surgeons, upper limb specialists, were retrospectively evaluated in the orthopedic and traumatology department of an upcountry city of Brazil. Diagnostic confirmation was achieved by examining anteroposterior, lateral, and occasionally oblique view radiographs; when necessary, due to associated lesions, computed tomography and/or magnetic resonance imaging of the affected elbow was performed.

The inclusion criteria were patients who underwent a surgical procedure to treat the terrible triad of the elbow, with age over 18 years, who agreed to participate and signed the Informed Consent Form, and who answered a previously prepared questionnaire.

The exclusion criteria were: inability to locate the patients for re-evaluation and presence of open fractures, pediatric fractures, isolated coronoid fractures, and isolated radial head fractures.

The patients were numbered chronologically according to the date of the surgical treatment by the orthopedists of the medical residency. Download English Version:

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