



Original article

Medial collateral ligament healing after posttraumatic radial head arthroplasty: A retrospective study of 33 cases with a mean follow-up of 73 months

Cicatrisation du ligament collatéral ulnaire après arthroplastie post-traumatique de tête radiale. Analyse rétrospective de 33 cas au recul moyen de 73 mois

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Received 20 April 2015; received in revised form 28 November 2015; accepted 4 December 2015

Abstract

Comminuted radial head fractures are usually associated with destabilizing lesions of the elbow. The radial head prosthesis (RHP) is a therapeutic alternative when fracture fixation is impossible, as it restores one of the elbow's secondary stabilizers. The aim of this study was to assess healing of the medial collateral ligament (MCL) after implantation of a RHP. All patients implanted with a RHP during the 2003–2012 period were eligible for follow-up ultrasound evaluation of MCL healing. A clinical evaluation with standardized tests (DASH and MEPS) was performed and the patients asked to evaluate their elbow's stability during the same follow-up visit. Out of the 33 eligible patients, 20 were included with a mean follow-up of 73 months. The MCL had been torn in 15 of these 20 patients; the MCL appeared healed on the ultrasound images in 13 patients. The elbow was considered subjectively stable in 19 patients. The mean DASH score was 21.4 (\pm 16.67) and the mean MEPS was 84.7 (\pm 13.9); these scores were 17.19 (\pm 14.0) and 88.3 (\pm 10.9) for patients with a healed MCL, versus 32.5 (\pm 10.6) and 70 (\pm 0.0) for patients with a non-healed MCL. Our findings suggest that a torn MCL can heal after RHP implantation, even without surgical ligament repair or reattachment. © 2016 SFCM. Published by Elsevier Masson SAS. All rights reserved.

Keywords: Medial collateral ligament; Elbow; Healing; Laxity; Posttraumatic; Radial head arthroplasty; Radial head replacement; Radial head prosthesis

Résumé

Les fractures comminutives de tête radiale sont fréquemment associées à des lésions déstabilisant le coude. La prothèse de tête radiale (PTR) est une alternative thérapeutique permettant de s'affranchir de l'ostéosynthèse quand elle est impossible, tout en rétablissant un élément de stabilité secondaire du coude. Cette étude cherchait à évaluer la cicatrisation du ligament collatéral ulnaire (LCU) après la mise en place d'une PTR. Trente-trois patients ayant bénéficié d'une PTR pour des lésions traumatiques fraîches sur la période 2003–2012 étaient éligibles pour évaluer la cicatrisation de la lésion du LCU, diagnostiquée par échographie postopératoire, non réparée chirurgicalement. Vingt patients ont été inclus, avec un recul moyen de 73 mois. L'évaluation clinique comportait des tests standardisés de type DASH et MEPS et une évaluation de la stabilité subjective du coude. Quinze patients parmi les 20 patients revus présentaient une rupture traumatique du LCU, 13 avaient un LCU cicatrisé à l'échographie. Le coude était considéré comme stable chez 19 patients sur 20. Le score DASH moyen était de 21,4 (\pm 16,67) ; il était de

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17,19 (\pm 14,0) chez les patients avec un LCU échographiquement cicatrisé et de 32,5 (\pm 10,6) chez les patients avec un LCU échographiquement non cicatrisé. Le MEPS moyen était de 84,7 (\pm 13,9) ; il était de 88,3 (\pm 10,9) chez les patients avec un LCU échographiquement cicatrisé et de 70 (\pm 0) chez les patients avec un LCU échographiquement non cicatrisé. Une cicatrisation du LCU est possible en l'absence de suture ou de réinsertion chirurgicale après la mise en place d'une PTR.

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Mots clés : Ligament collatéral médial ; Coude ; Cicatrisation ; Laxité ; Post-traumatique ; Arthroplastie de tête radiale ; Remplacement de tête radiale ; Prothèse de tête radiale

1. Introduction

Radial head and neck fractures make up 1.7% to 5% of all fractures [1,2]. The incidence is 2.8 per 10,000 inhabitants per year in North America [3]. Other structures can be injured at the same time; the occurrence of these injuries is correlated to the severity of the initial fracture event. The associated lesions can affect ligament, capsule, bone or cartilage structures. The incidence of these associated lesions is 30% for all radial head fractures and more than 75% for comminuted fractures [2,4]. Comminuted fractures can be considered type III fractures in Mason's classification system [5].

The primary concern is associated injuries to the medial collateral ligament (MCL). This structure must not be confused with the lateral ulnar collateral ligament (LUCL) that corresponds to the posterior bundle of the radial collateral ligament (RCL). To prevent confusion, the French and English terms for these ligaments are show in Figs. 1 and 2.

In a study evaluating the incidence of ligament injuries in displaced and comminuted radial head fractures, the MCL was found to be injured in 54% of elbows, the RCL in 80% and both ligaments in 50% of cases [6]. Schwab et al. hypothesized why MCL tears often occur at the same time as the radial head fractures [7] (Fig. 3).

Elbow dislocation occurs in 14% of radial head fracture cases [4]. In every case of elbow dislocation, the MCL is completely torn and avulsed from its medial epicondylar

attachment [8,9]. Recent studies tend to show that these lesions are very common in patients with comminuted radial head fractures, despite not being diagnosed clinically [10]. They may impact long-term outcomes by altering the elbow's stability.

Elbow stability has two mechanisms: static stability ensured by the congruence of joint surfaces, collateral ligaments and anterior capsule, and dynamic stability ensured by muscle co-contraction. The elbow's stabilizing elements can be classified into primary and secondary structures. An injury to a primary stabilizing structure leads to instability. Although the absence of secondary structures by itself is not enough to cause instability, injury to a secondary structure can make the joint more unstable when it occurs at the same time as an injury to a primary structure [11].

The primary stabilizing structures are the medial collateral ligament (MCL) and radial collateral ligaments (RCL), along with the humeroulnar joint, in particular the olecranon [11,12]. The secondary stabilizing structures are the humeroradial joint, joint capsule and tendons of the medial and lateral epicondylar muscles [12,13]. Injuries to the MCL and RCL can be detected clinically by applying a valgus or varus stress to the elbow. The ligament can be confirmed using ultrasonography [14] or MRI [6].

Radial head prostheses (RHP) were developed to treat radial head fractures that cannot be fixed, particularly when they occur in combination with an injury to one or more of the elbow's stabilizing structures [15–17].

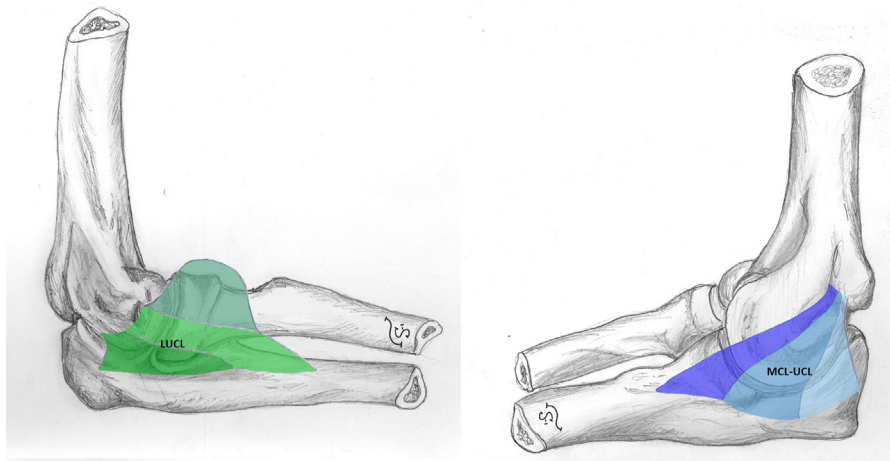


Fig. 1. Medial collateral ligament (MCL) or ulnar collateral ligament (UCL), different from lateral ulnar collateral ligament (LUCL), part of the lateral collateral ligament.

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