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Original article

Treatment of comminuted distal radius fractures by resurfacing prosthesis in elderly patients

Traitement des fractures comminutives de l'extrémité distale du radius chez les patients âgés par prothèse de resurfaçage

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Abstract

In elderly patients, distal radius fractures are often associated with osteoporotic bone. Under these conditions, anatomic resurfacing implants may provide satisfactory results in terms of range of motion, pain and function. Between July 2009 and January 2012, eight elderly patients were treated with the SOPHIA™ implant at our hand surgery department. Inclusion criteria were isolated comminuted distal radius AO type C2 fractures in patients greater than 70 years of age. All patients were reviewed in February 2013 by an independent surgeon. Clinical, functional and radiographic assessments were performed. Mean follow-up was 25 months (range 17–36 months). Mean ROM was 45° (range 40–50°) in flexion and 44° (range 40–50°) in extension. Mean pronation-supination range was 160°. Mean grip strength was 18 kgf. Mean Quick DASH was 18.2/100 (range 6.82–29.55) and mean pain on VAS was 2.33 (range 0–4). X-rays did not reveal any implant loosening or ulnar translation of the carpus. Use of a wrist resurfacing implant led to rapid recovery of autonomy in elderly patients with comminuted distal radius fractures. It parallels the use of shoulder or elbow prostheses for complex joint fractures in the elderly.

Keywords: Resurfacing prosthesis; Elderly patient; Distal radius fractures

Résumé

Les fractures de l'extrémité distale du radius du sujet âgé sont souvent corrélées à un os de mauvaise qualité dans un contexte d'ostéoporose. Une prothèse anatomique de resurfaçage de l'extrémité distale du radius dans ce contexte permettrait d'obtenir des résultats satisfaisants en termes de mobilité, douleur et fonction. De juillet 2009 à janvier 2012, huit patients âgés ont bénéficié de la mise en place de la prothèse SOPHIA™ (Biotech) dans notre unité de chirurgie de la main. Les critères d'inclusion étaient les fractures comminutives articulaires isolées de l'extrémité distale du radius de type C2 de la classification de l'AO chez des patients de plus de 70 ans. Tous les patients ont été revus en février 2013 par un chirurgien indépendant. Nous avons réalisé une évaluation clinique, fonctionnelle et radiographique. Le recul moyen lors de la dernière évaluation était de 25 mois (17–36). Les mobilités moyennes en flexion étaient de 45° (40–50), en extension de 44° (40–50). L'arc de mobilité en pronation-supination était en moyenne de 160°. La force de serrage moyenne était de 18 kgf. Le DASH moyen était de 18,2 sur 100 (6,82–29,55). La douleur moyenne appréciée par l'EVA était de 2,33 (0–4). Les radiographies n'ont pas mis en évidence de descellement de l'implant ni de glissement ulnaire du carpe. Cette technique permet de restaurer rapidement l'autonomie des patients âgés présentant une fracture complexe de l'extrémité distale du radius. Elle reprend le principe des prothèses d'épaule ou de coude pour traiter les fractures articulaires complexes du sujet âgé.

Mots clés : Prothèse de resurfaçage ; Sujets âgés ; Fracture de l'extrémité distale du radius

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1. Introduction

Displaced distal radius fractures are becoming more frequent and remain a public health problem [1]. The main treatment goals are a short immobilization period and good functional results [2,3]. Several treatment options are available and surgical management is still controversial [2,4]. Although some authors have demonstrated good tolerance of mal-unions in elderly [5], most have found that anatomical reduction is required to obtain good functional results [4,6]. In case of articular fractures, the best stability seems to be obtained with volar distal radius locking plates. In case of comminuted articular fractures, Richard et al. advocated the use of distraction plating [4]. However, the osteopenia in elderly patients increases comminution and makes anatomical reduction and stable fixation more difficult to achieve. This may be one reason why complex articular fractures in elderly patients are increasingly being treated by arthroplasty (elbow, knee, shoulder, etc.) [7].

In this study, we assessed the results of treatment with a resurfacing prosthesis for comminuted distal radius fractures in elderly patients. This new treatment concept was first described by Roux in 2009 [8].

2. Patients and methods

2.1. Patients

From 2009 to 2012, 284 elderly patients (70 years old and more) with complex articular distal radius fractures were treated in our hospital. During this period, eight consecutive patients underwent unipolar wrist arthroplasty with a resurfacing prosthesis of distal radius (SOPHIA, Biotech International, Salon de Provence, France) (Fig. 1). The indications for this prosthesis were fractures with metaphyseal comminution, significant radial shortening, articular comminution (C2 distal radius fractures according to the AO classification) in patients older than 70 years without distal ulna fractures (except the ulnar styloid process) [8]. The same surgeon performed all the surgical procedures.

2.2. Surgical technique [8]

The procedure was performed under regional anesthesia (axillary block). A 5–6 cm dorsal incision was made along the axis of the third finger. The dorsal retinaculum was opened longitudinally between the 3rd and 4th compartments. Only the extensor pollicis longus tendon, which crosses the incision, was protected. Subperiosteal dissection was performed along the bone as described by Roux [8] to maintain ulnoradial carpal stability. At this time, posterior interosseous nerve was coagulated and resected. Once all the epiphyseal fragments had been resected, the distal radius was resected using prosthesis-specific instrumentation to achieve negative ulnar variance. Trials were performed to confirm the size of prosthesis needed. Intraoperative X-rays were taken to verify positioning. After testing for stability and mobility, the implant was cemented in the radius. Patients were immobilized in a below-elbow cast for three weeks to allow for soft tissue healing. After three weeks, self-rehabilitation was initiated. Six weeks after surgery, patients underwent 15 physical therapy sessions.

2.3. Radiographic examination and clinical evaluation

All patients were reviewed by an independent surgeon in February 2013. Wrist mobility and grip strength were measured

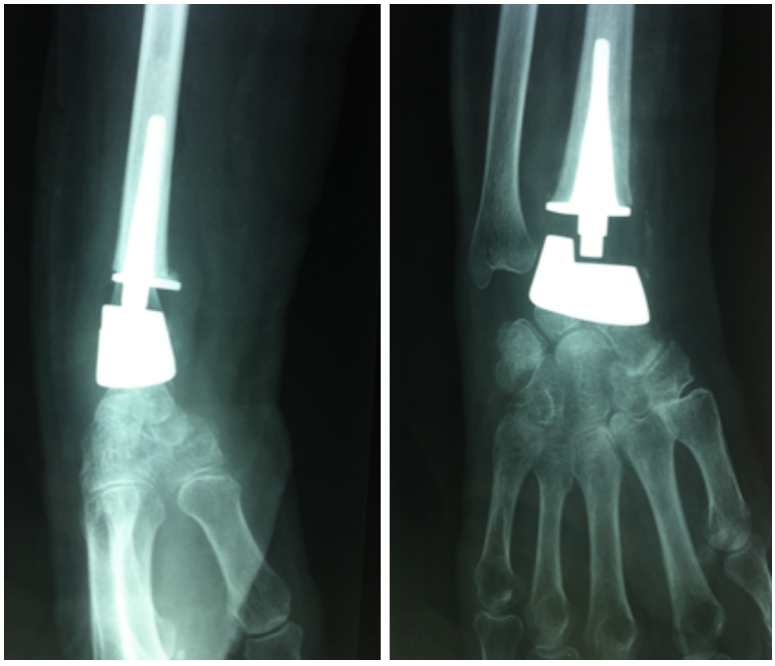

Fig. 1. Example of the SOPHIA wrist resurfacing prosthesis.