



ELSEVIER

ORIGINAL ARTICLE

The influence of body mass index on outcome of open arthrolysis for post-traumatic elbow stiffness

Wei Zheng, MD, Shuai Chen, MD, Jialin Song, MD, Jiazhi Liu, MD, Cunyi Fan, MD, PhD*

Department of Orthopaedics, Shanghai Jiao Tong University Affiliated Sixth People's Hospital, Shanghai, China

Background: Being overweight has become a serious public health concern in China. Higher body mass index has been proven to be associated with poor outcome after orthopedic surgery. The purpose of this study was to examine the effect of being overweight on functional outcomes and complications after open arthrolysis for post-traumatic elbow stiffness.

Methods: We performed a retrospective study including 122 patients with post-traumatic elbow stiffness undergoing arthrolysis, including 84 in the normal weight group and 38 in the overweight group. Demographic data, surgical data, and data on preoperative and postoperative functional performance and complications were obtained.

Results: Demographic data and disease characteristics were comparable between the 2 groups at baseline. All patients showed significant improvement after elbow arthrolysis. Postoperatively, the range of motion and Mayo Elbow Performance Score of the normal weight group were significantly better than those of the overweight group. Sixteen patients developed postoperative complications. No significant differences in complication rates between the 2 groups were found.

Conclusions: Most patients showed satisfactory functional outcomes after arthrolysis. The postoperative functional outcomes of the overweight group were inferior to those of the normal weight group to a certain extent. This study underlines the importance of detailed rehabilitation instructions in patients with higher body mass index.

Level of evidence: Level III; Retrospective Cohort Design; Treatment Study

© 2017 Journal of Shoulder and Elbow Surgery Board of Trustees. All rights reserved.

Keywords: Post-traumatic elbow stiffness; arthrolysis; body mass index; overweight; functional performance; postoperative complications

Wei Zheng, Shuai Chen, and Jialin Song contributed equally to the manuscript.

The Ethics Committee of our hospital concluded that no approval of the committee was necessary because of the retrospective design of the study. All patients signed informed consent to collect, file, and use the data.

*Reprint requests: Cunyi Fan, MD, Department of Orthopaedics, Shanghai Jiao Tong University Affiliated Sixth People's Hospital, 600 Yishan Road, Shanghai 200233, China.

E-mail address: fancunyi888@163.com (C. Fan).

Currently, being overweight and obesity have become a major public health concern worldwide. In 2008, 1.46 billion adults worldwide had a body mass index (BMI) of ≥ 25 kg/m², and one-third of them were classified as obese.⁶ According to the Working Group on Obesity in China criteria, obesity prevalence approximately tripled from 3.75% to 11.3% among Chinese adults from 1991 to 2011.^{17,34} As reported by extensive studies, being overweight and obesity are associated with

longer hospital stays and negative functional outcomes after orthopedic procedures, such as total joint arthroplasty and arthroscopy; they have also been correlated with increased perioperative and postoperative complications, including greater infection rates, increased need for revision surgery, and difficulty in achieving fracture union.^{1,11,13,23,31} Moreover, several other studies found negative results on comparing nonobese and obese patients.^{16,27,28}

Elbow stiffness is a common complication after elbow trauma or surgery, with an incidence ranging from 5% to 40%.^{20,22,29} It is generally defined as elbow range of motion (ROM) $\leq 100^\circ$, and a loss of 50° of motion results in an 80% functional loss in daily living and work-related activities.²² Post-traumatic elbow contractures can be the result of intrinsic or extrinsic causes, including long-term immobilization, soft tissue contracture, intra-articular block, and heterotopic ossification formation.^{18,19} Both nonsurgical and surgical methods are used to treat post-traumatic elbow stiffness. Currently, when conservative treatment fails to improve functional outcomes, open arthrolysis, which has been proven effective with a relatively low incidence of complications, is employed.^{9,14,24}

Several studies have focused on the influence of BMI on elbow surgery. Golden et al reported that increased BMI in healthy children is negatively correlated with ROM of the elbow joint.⁷ Previous studies also demonstrated the adverse effects of obesity on functional outcomes and postoperative complications after various elbow operations, including arthroplasty, arthroscopy, and open reduction and internal fixation (ORIF).^{2,5,8,32,33} The goal of this retrospective study was to compare the functional outcomes and postoperative complications between overweight and normal weight patients with post-traumatic elbow stiffness after they have undergone arthrolysis. Given the evidence that increased BMI is a predisposing factor for increased complications and adverse functional outcomes after different orthopedic procedures, we hypothesized that being overweight would have a similar negative effect on outcomes after elbow arthrolysis.

Materials and methods

Patients and data collection

A retrospective study on prospectively collected data of all patients treated with elbow arthrolysis combined with hinged external fixation between September 2013 and December 2014 was conducted. The inclusion criteria were as follows: (1) skeletal maturity, (2) post-traumatic elbow stiffness with total arc of flexion and extension $\leq 100^\circ$, and (3) minimum follow-up of 12 months. The exclusion criteria were as follows: (1) history of burn injury or central nervous system injury, (2) associated nonunion or malunion of the elbow joint, (3) severe articular damage requiring joint arthroplasty, (4) receiving other elbow ORIF or second arthrolysis during the follow-up period, and (5) unwillingness to participate in the study. All operations were performed by the same senior surgeon.

Preoperative demographics, including age, sex, height, weight, current smoking history, and comorbidities, were recorded. According to World Health Organization criteria, obesity can be classified by BMI, the body weight in kilograms divided by the height in meters squared. All the participants were classified according to their BMI as follows: normal weight (BMI $< 25 \text{ kg/m}^2$) and overweight (BMI $\geq 25 \text{ kg/m}^2$). The following baseline clinical data were also collected: disease duration, diseased side, original injury type, treatment history, ROM, visual analog scale (VAS) score for pain, and Mayo Elbow Performance Score (MEPS). Original injury type included distal humerus fractures, radial head fractures, olecranon fractures, coronoid fractures, elbow dislocations, Monteggia injuries, terrible triad injuries (radial head fracture and coronoid fracture, combined with an ulnohumeral dislocation), and floating elbow fractures (concomitant fractures of both the forearm and the distal humerus). Motion of the diseased elbow was assessed by a goniometer to measure flexion, extension, pronation, and supination. The MEPS is widely used to evaluate patients' elbow function; it includes four subscales, namely, pain, ROM, stability, and activity of daily living. The questionnaire generates an overall score ranging from 0 to 100, which can be classified into 4 groups: excellent, 91 to 100; good, 81 to 90; fair, 71 to 80; and poor, 0 to 70. The following information related to the operation was also assessed: operative time, type of anesthesia, number of anchors used for surgical fixation, blood transfusion, and intraoperative complications (including intraoperative fracture and nerve injury). At follow-up, postoperative complications, including infection, elbow instability, and nerve complications, were evaluated. Clinical evaluation, ROM of the elbow joint, MEPS, Δ ROM (postoperative ROM – preoperative ROM), and Δ MEPS (postoperative MEPS – preoperative MEPS) were also assessed. All the clinical assessments were performed by authors W.Z., S.C., and J.L.

Surgical technique

Operations were performed under axillary block or general anesthesia. The approach was chosen on the basis of the previous surgical approach and location of disease. In general, patients underwent arthrolysis by a combined lateral and medial approach. An extended Kocher approach was applied on the lateral side to release the anterior part of the elbow. To release the posterior part of the elbow, we applied a medial incision posterior to the medial epicondyle. Subsequently, the posterior band of the medial collateral ligament and posterior capsule were released, and bone impediments or scar tissues were removed under direct visualization. If patients had undergone previous surgery by the posterior approach, the approach was commonly performed along the previous scar. After soft tissue flap elevation, the same procedures as those in the medial and lateral approach were performed. During the operation, the anterior part of the medial collateral ligament and ulnar bundle of the lateral collateral ligament were preserved for elbow stability. Subcutaneous anterior transposition of the ulnar nerve was performed for all patients with the medial approach. Atraumatic sutures were applied to reattach the ligaments. Finally, a hinged external fixation was applied, with 2 nails each on the humerus and ulna.

Postoperative treatment

Postoperative rehabilitation was standardized for all patients. After surgery, patients were prescribed 200 mg of celecoxib once daily

Download English Version:

<https://daneshyari.com/en/article/5710463>

Download Persian Version:

<https://daneshyari.com/article/5710463>

[Daneshyari.com](https://daneshyari.com)