



## A review of 24 cases of elbow arthroscopy using the DASH questionnaire

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Elbow arthroscopy is growing in importance as a minimally invasive procedure directed at detecting and treating various pathologies affecting the elbow. We report our indications and results with this technique.

With a mean follow-up of 6 years, a group of 24 patients out of 35 who consecutively underwent elbow arthroscopy over a 12-year period were retrospectively evaluated. We analysed the indications, the arthroscopic procedures, post-operative results and complications.

The primary outcome was evaluated using the DASH questionnaire. Pain and function were evaluated as secondary outcomes by mean of visual analogic scales.

The mean postoperative DASH score, expressed in normative value was 56.01. The pain and function scores were 2.60 and 6.92 out of 10.00 respectively.

In our experience, elbow arthroscopy appears as a safe and effective technique. No permanent complication was observed. Our patients treated by elbow arthroscopy showed a good post-operative function and minimal residual pain.

**Keywords** : elbow ; arthroscopy ; DASH questionnaire ; retrospective study.

performed increasingly in the past few years and new indications constantly emerge. It is known to offer better visualisation of the elbow joint , less post-operative pain, lower infection rates and decreased scarring than open surgery (7). It has however also proved to be technically demanding and potentially devastating especially owing to possible neurovascular lesions (7,11,14).

Elbow arthroscopy is usually used for diagnostic purposes, loose body extraction, arthrolysis and osteophyte resection (1,8,9,12). It is also frequently used in rheumatoid elbows when synovectomy is required (16). As degenerative arthritis is usually accompanied by osteophyte formation, loose bodies and capsular retraction, these patients are more frequently potential candidates to this kind of surgery (4,13,15).

Our goal in this study was to evaluate our experience in elbow arthroscopy. We analysed the indications for surgery and types of arthroscopic procedures performed, and the post-operative results and complications.

### INTRODUCTION

Since Burman (2) stated in 1932 that the elbow joint “can be visualised directly by means of the arthroscope”, the use of arthroscopy in elbow surgery has shown a remarkable growth. It has been

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The results were assessed based on residual disability in activities of daily living, sports and work, elbow function and pain with the DASH questionnaire.

The self-reported Disability of Arm Shoulder and Hand questionnaire is a standard evaluation tool (6), which is more and more frequently used but has never been used to our knowledge for post-operative elbow arthroscopy evaluation.

## PATIENTS AND METHODS

### Patients

This is a retrospective review of outcomes in a consecutive series of 35 patients operated on within a 12 year-period in two different hospitals : the Princess Paola Hospital of Marche-en-Famenne and the St-Luc University Hospital in Brussels. All the pre- and postoperative charts were available.

We submitted by post a questionnaire and two visual analogical scales to these 35 patients ; 24 responded to our enquiry.

There were 9 women and 15 men with a mean age of 38.4 years (range : 13 to 59). Mean follow-up period was 6 years (range : 3 months to 12 years).

The main motivations for consultation were : lack of mobility and pain (n = 7), articular locking and pain (n = 6), and isolated pain (n = 6) (fig 1).

Most frequent types of arthroscopic surgery performed were : loose body removal (n = 18), synovectomy (n = 9), osteophyte resection (n = 5), arthrolysis (n = 4) (table I).

The final diagnosis was in 8 cases a loose body or joint contracture following a traumatic event, loose bodies due to synovial chondromatosis (n = 6) or osteochondritis dissecans (n = 3), loose bodies of unknown aetiology (n = 3), degenerative osteoarthritis (n = 2), other diagnoses (n = 2).

### Outcomes

The principal outcome was calculated with respect to the disability in activities of daily living, sports and work, measured by the Disability of Arm Shoulder and Hand questionnaire. As proposed by the American Academy of Orthopedic Surgeons, we expressed the functional disability in normative value by comparison to a standard population (mean value in this population : 50.00 ; SD : 10.00). Any value above 50.00 represents

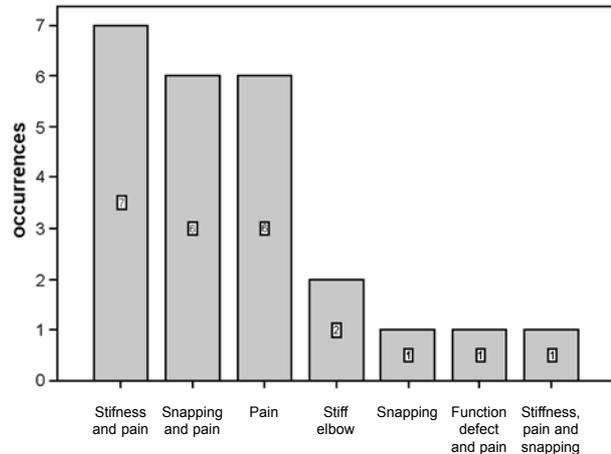


Fig. 1. — Patient's motivation to consult

Table I. — Type of surgery

Type of surgery	Occurrence
Loose body extraction	8
Loose body extraction / Synovectomy	5
Loose body extraction / Synovectomy / Arthroplasty	2
Loose body extraction / Arthroplasty	1
Fragment refixation / Loose body extraction	1
Diagnostic	1
Diagnostic / Loose body extraction	1
Diagnostic / Synovectomy	1
Synovectomy / Arthrolysis	1
Arthrolysis	1
Arthrolysis / Arthroplasty	2
<b>Total</b>	<b>24</b>

an increased disability. Besides the main questionnaire module, there were two optional modules of 4 questions each concerning sports and working abilities. We used a French version of the questionnaire.

All questionnaires were correctly and fully completed by the patients, otherwise, they were contacted to complete the evaluation.

Seventeen patients filled in the optional sports module and 19 the optional work module.

Elbow function and pain related to the elbow were determined by visual analogical scales and reported as secondary outcomes.

The function scale ranges from 0 (no function at all) to 10 (perfect elbow function).

The pain scale ranges from 0 (no pain at all) to 10 (unbearable pain).

### Operative technique

Our standard arthroscopic equipment included a 4-mm, 30° angle arthroscope, a pump with flow and pressure control, a motorised shaver (Dyonics), pincers, and an ultrasonic coagulator (VAPER, Depuy).

Patients were installed in lateral decubitus position with a support under the distal arm. The forearm was allowed to swing free. A tourniquet was used during the procedure. An elastic bandage was wrapped around the hand and forearm to limit fluid dispersion. The elbow joint was distended and approached via a mid-lateral portal at the center of a triangle bordered by the olecranon, the lateral epicondyle, and the radial head. Thereafter, a postero-lateral portal created at the level of the tip of the olecranon and just lateral to the border of the triceps was used in conjunction with a trans-tricipital portal. The anterior compartment was initially approached through the proximal lateral portal, 2 cm proximal to the lateral epicondyle and directed to the anterior margin of the humerus. The proximal medial portal was created by arthroscopic visualisation and transcutaneous illumination. The articulation was thoroughly rinsed with saline. Immediate post-operative mobilisation and physiotherapy were allowed.

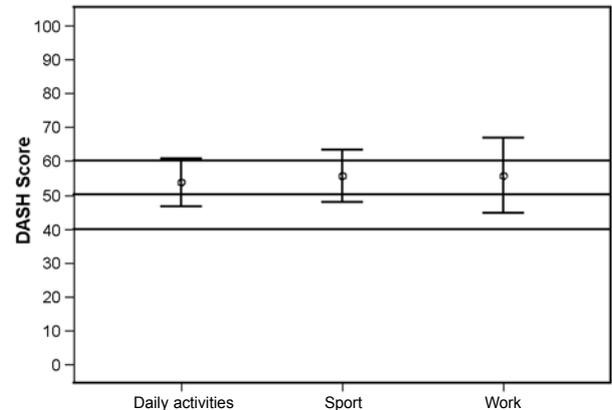
### RESULTS

The mean outcome based on the DASH questionnaire was  $56.01 \pm 11.26$ . Seventeen patients filled in the sports optional module with a mean result of  $53.64 \pm 11.87$ . Nineteen responded to the work optional module with a mean result of  $58.10 \pm 18.31$  (fig 2).

The mean VAS score for elbow function was  $6.9 \pm 2.4$ . The mean VAS score for pain was  $2.6 \pm 2.2$ .

We noted a small granuloma on one of the portal scars in one case. In three cases, diagnostic arthroscopy was performed to identify the pathology affecting the joint, leading in one case to the diagnosis of a *Mycobacterium tuberculosis* infection of the joint.

Out of the 11 patients who did not respond to our enquiry, there were 10 men and 1 woman with a mean age of 32.1 years (range : 15 to 61). Their main complaints were articular locking and pain ( $n = 4$ ), and lack of mobility and pain ( $n = 3$ ). The arthroscopic procedures most performed were loose body extraction ( $n = 9$ ), synovectomy ( $n = 4$ )



**Fig. 2.** — DASH score for activities of daily living, for sport and work, expressed in normative value (norm in the population = 50 ; SD 10) with 95% confidence intervals reported.

and artholysis ( $n = 2$ ). Within this group of 11 patients, we noted transient hyperaesthesia of the lateral forearm in one case.

### DISCUSSION

The indications for elbow arthroscopy were initially loose body removal and diagnostic arthroscopy (15), but constant advances in arthroscopic technique have allowed for its use in other indications. Its major indication now appears to be in degenerative osteoarthritis, followed by loose bodies (7).

In our study however, the main indication was loose body removal mainly following trauma or synovial chondromatosis. In order to assess the value of this technique, we chose patient reported outcomes as tools for primary and secondary outcomes evaluation. We used the DASH questionnaire, which is more and more frequently used as a standard evaluation tool for upper limb disability, but has not yet been used to assess patients following elbow arthroscopy. However, the DASH questionnaire has already been validated in elbow evaluation (3,5,10,17). The advantage with this type of tool is that it is less exposed to observer bias than observer-based systems (13).

On the DASH evaluation, our results showed no difference in elbow function between a standard population and our group of patients. Neither the

sports module nor the work module showed any difference (fig 2). Pain assessed by the patients with the visual analogic scale remained low. Function assessed by the patients with the VAS was fairly good, with a mean score of nearly 7 out of 10.

Kelly *et al* (7) reported that the most common minor complications are transient nerve palsies and persistent drainage at the portal site. They also reported that the main major complications are deep joint infection, post-operative contracture and nerve injury.

In this series, no major complication occurred, and we noted two minor complications, none of which had permanent consequences.

In conclusion, elbow arthroscopy appeared as a safe and effective technique.

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