

# Open Tennis Elbow Release Surgery (in Chronic Case)

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**Objective:** To assess the results of open tennis elbow surgery in patients whom the elbow had failure after conservative treatment.

**Material and Method:** Retrospective analysis of 22 patients underwent tennis elbow surgery at the HRH Princess Maha Chakri Sirindhorn Medical center during the period from January 2003 to December 2010. Age, sex, duration of symptom, pain score and complications were included in analysis. Patients were asked to rate their pain on a 0-10 visual analogue pain scale (VAS). Grip strength of both hands was measured with a digital hand dynamometer. Measurements were made with the elbow fully extended and the average of two measurements was recorded as the strength.

**Results:** The mean visual analogue pain score at one month fell from 6.7 (5.0-8.6) to 2.1 (1.0-3.4) ( $p < 0.05$ ). When the grip strengths were measured, the increases that occurred at one month, two months and six months postoperative were significant ( $p < 0.05$ ). One superficial wound infection was found which responded to oral antibiotics.

**Conclusion:** The release of tennis elbow (failure after conservative treatment) is an effective procedure with low rate of complications.

**Keywords:** Tennis elbow, Open tennis elbow surgery, Conservative treatment

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Tennis elbow or lateral epicondylitis was first described in 1873<sup>(1)</sup>. Some controversy still exists regarding the etiology and the pathogenesis of this condition<sup>(2)</sup>. The basic underlying lesion seems to be a microscopic tear in the origin of the extensor carpi radialis brevis tendon that heals with immature reparative tissue<sup>(3,4,7)</sup>. Operative treatment should be considered after non-operative treatment has failed. The principles of operative treatment were excised granulation tissue that is seen in the extensor carpi radialis brevis origin<sup>(3)</sup>. A small area of the lateral epicondyle may be decorticated or drilled to improve the blood supply for healing of the tendon origin. The aim of this investigation was to assess, the results of open tennis elbow surgery in patients whom the elbow had failure after conservative treatment.

## Material and Method

The authors undertook a retrospective analysis of 22 patients who underwent open tennis

elbow surgery at the HRH Princess Maha Chakri Sirindhorn Medical center during the period from January 2003 to December 2010. Age, sex, duration of symptom, pain score and complications were included in analysis. Inclusion criteria included symptoms lasting for one year following presentation, failure of conservative treatment including oral NSAIDs, physiotherapy and local steroid injection. Patients were asked to rate their pain on a 0-10 visual analogue pain scale (VAS), with 0 representing no pain and 10 the worst pain. The patients were evaluated at one month, two months and six months after the operation. Grip strength of both hands was measured with a digital hand dynamometer. Measurements were made with the elbow fully extended and the average of two measurements was recorded as the strength.

## Operative technique

The operations were performed with the use of a standard sterile technique. A straight incision was made approximately four centimeters long at lateral epicondyle (extending from two centimeters proximal to the lateral epicondyle to two centimeters distal to this structure (Fig. 1)). The extensor origin was exposed and allowed to retract medially (Fig. 2). The granulation tissue was excised from the extensor carpi radialis brevis origin until the synovial membrane of the radiohumeral

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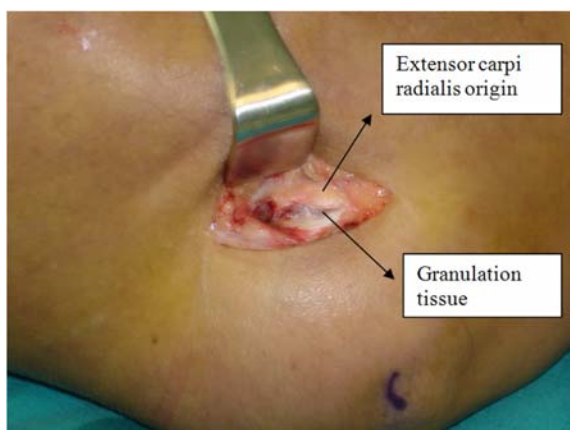
joint was visible. When the wound was closed, only the subcutaneous tissues and the skin were sutured<sup>(3)</sup>.

### Statistical analysis

The paired t-test was used to compare the grip strengths before and after treatment. The Chi-square test was used to assess relationships between the preoperative variables and the results of treatment.



**Fig. 1** Anatomical landmark and skin incision



**Fig. 2** Granulation tissue at extensor carpi radialis brevis origin

P-values of less than 0.05 were considered to be statistically significant.

### Results

The details clinical characteristics of twenty two patients with tennis elbow are shown in Table 1. The mean visual analogue score at one month had fallen from  $6.7 \pm 2.1$  to  $2.1 \pm 1.3$  ( $p < 0.05$ ). At six months 21 of 22 patients had pain free. The grip strengths on the affected and the normal sides were measured before and after the operative release (Table 2). When the grip strengths were measured, the increases that occurred at one month, two months and six months postoperative were significant ( $p < 0.05$ ). One superficial wound infection was found postoperatively which respond to oral antibiotics and the patient had pain free after two months.

### Discussion

The short-term results of the operation in our patients were impressive as those described by other authors<sup>(4)</sup>. In the present study, average grip strength improved after the operation but did not quite reach the power level of the unaffected elbow at six months, only seven of the twenty-two patients (31 percent) who were evaluated one month after the operation were free of pain. The elbows continued to improve during the six month after the operation, so that twenty-one (95 percent) were completely free of pain at one year.

One superficial wound infection was found

**Table 1.** Characteristic of patients

Male/female	8 (46.3%)/14 (53.7%)
Right/left	13 (73.9%)/9 (26.1%)
Age (years old)	$44.9 \pm 8.5$
Duration of symptoms (month)	$20.6 \pm 5.5$
Conservative therapy	
Duration (month)	$18.3 \pm 3.3$
NSAIDs	22 (100%)
Brace, tape, corticosteroid injection	21 (74.6%)

**Table 2.** Grip strength and visual analogue scale

	Grip strength (affected side)	Grip strength (normal side)	VAS
Pre-operative	$18.6 \pm 3.1$	$38.4 \pm 1.4$	$6.7 \pm 2.1$
One month after surgery	$26.1 \pm 2.9$	$38.2 \pm 2.1$	$2.1 \pm 1.3$
Two month after surgery	$34.5 \pm 4.2$	$37.9 \pm 1.8$	$1.8 \pm 1.1$
Six month after surgery	$35.3 \pm 3.8$	$38.4 \pm 1.0$	21/22 pain free

which respond to oral antibiotics. The authors concluded that open tennis elbow release operation is an effective procedure with a low rate of complications.

#### Potential conflicts of interest

None.

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### การผ่าตัดแบบเปิดผิวหนังในการรักษา Tennis elbow

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**วัตถุประสงค์:** รายงานผลการรักษาด้วยการผ่าตัดแบบเปิดผิวหนังในผู้ป่วย Tennis elbow

**วัสดุและวิธีการ:** ศึกษาข้อมูลผู้ป่วย Tennis elbow ที่ได้รับการรักษาโดยการผ่าตัดในศูนย์การแพทย์สมเด็จพระเทพรัตนราชสุดาฯ สยามบรมราชกุมารี ตั้งแต่ มกราคม พ.ศ. 2546 ถึง ธันวาคม พ.ศ. 2552 เก็บข้อมูล อายุ เพศ อาการปวด แร่งกำมือเปรียบเทียบกับก่อนผ่าตัด

**ผลการศึกษา:** ผู้ป่วยทั้งหมด 22 ราย หายจากอาการปวด 21 ราย แร่งกำมือเพิ่มขึ้นอย่างมีนัยสำคัญทางสถิติ หลังผ่าตัด ในการศึกษารั้งนี้พบภาวะแทรกซ้อน 1 ราย คือ การติดเชื้อบริเวณผิวหนังที่ผ่าตัด ซึ่งตอบสนองต่อยาปฏิชีวนะชนิดรับประทาน

**สรุป:** การผ่าตัดด้วยวิธีเปิดผิวหนังในผู้ป่วย Tennis elbow ได้ผลการรักษาอยู่ในเกณฑ์ดีโดยไม่มีภาวะแทรกซ้อนรุนแรง

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