

# FUNCTIONAL OUTCOME OF SURGICAL RELEASE OF DE QUERVAIN'S DISEASE

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## ABSTRACT

**Background:** Stenosing tenosynovitis of the abductor pollicis longus and extensor pollicis brevis tendon occurs typically in adults 30-50 years old. Various modalities of treatment has been proposed for De Quervain's Disease. The outcome of conservative treatment for this condition has shown variable results. Surgery has outstanding results when conservative measures fail to take care of the problem. **Aims and Objectives:** To study the functional outcome of surgical release of De Quervain's disease. **Materials and Methods:** Observational prospective study was carried out in Outpatient Department (OPD) of Western Regional Hospital, Pokhara in patient of age group 16-60 years who didn't improve with conservative treatment after a period of 6 weeks and then will be undergoing surgical release for the same problem. Time taken to return to normal activities, anatomical variant of tendons in first extensor compartment, complications, VAS score and effectiveness of the surgery using modified Mayo wrist score will be taken under consideration. **Results:** Out of 30 patients taken into study, 27(90%) were female and 3(10%) were male with female:male ratio of 9:1. 17(57%) were right hand and 13(43%) were left hand involvement and 24(80%) were right hand dominant and 6(20%) were left hand dominant. Maximum number of patients allocated in our study falls in age group of 31-45 years with mean age group being 40.2 years(50%) followed by age group of 46-60 years(30%) with least number in age group of 15-30 years (20%). 20 cases (66.67%) were house wives, 6(20%) were student, 3(10%) were job holders. 53.3% patients had symptoms of duration 6-12 months followed by one year duration(13.3%) and least in less than six months duration(13.3%). Duration of surgery was in the range of 10-25 minutes with mean time of 12 minutes. Time taken to return to job was within six weeks with mean duration of 2 weeks. 2 patients had persistent pain however, it was managed with analgesics. Preoperative VAS score 7.4 that improved to 2.1 at 2 weeks Postoperatively(POD), 1.43 at 6 weeks and 1.13 at 6 months. 26(86.67%) had excellent, 3(10%) had good and 1(3.33%) had fair results at 6 months follow up which was analysed by Modified Mayo Wrist Score. **Conclusion:** This study showed that functional outcome of surgical release of refractory de Quervain's disease is excellent with minimum complications and surgery should be considered in those patients who do not respond to conservative treatment up to 6 weeks.

**Key words:** De Quervain's disease<sup>1</sup>, Stenosing tenosynoviti<sup>2</sup>, surgical release<sup>3</sup>

## INTRODUCTION:

Stenosing tenosynovitis of the abductor pollicis longus and extensor pollicis brevis tendon occurs typically in adults 30-50 years old [1]. Despite great interest in the condition, its etiology and pathology remain uncertain. It usually occurs in younger economically productive population and more common in women than men. Patients affected are mothers of infants aged 6-12 months, day care workers, and others who repetitively lift infants. It may be initiated by overuse but it also occurs spontaneously, particularly in middle aged women, and sometimes during pregnancy. The presenting symptoms usually are pain, tenderness at the radial styloid. The Finkelstein test is usually positive. On grasping the patient's thumb and quickly abducting the hand ulnar ward, the pain over the ulnar styloid tip is excruciating. Although, Finkelstein stated that this test is probably the most pathognomic objective sign. It is not diagnostic; the patient history, occupation, the radiographs and other physical findings must be considered. Sometimes a thickening of fibrous sheath is palpable. Patients experience pain with thumb and wrist movement. The pain radiates proximally to the forearm and is aggravated by use of the thumb. Management is usually conservative and consists of rest on a splint and injection of steroid preparation may be successful early after onset. Initial treatment with steroid injection may yield complete pain relief in over 70% of patients [2]. When pain persists, surgery is the treatment of choice. Release of the first dorsal compartment by simple incision for chronic De Quervain's tenosynovitis is considered a simple procedure. However, its complications include volar subluxation of abductor pollicis longus and extensor pollicis brevis, radial sensory nerve injury including scarring and adhesions of the nerve, and inadequate decompression and reflex sympathetic dystrophy.

## 2. Aims and objectives:

### 2.1 General

To study the functional outcome of surgical release of De Quervain's disease.

### 2.2 Specific

- To know time taken to return to normal activities.
- To study the anatomical variation of tendons in first extensor compartment.
- To study the complication like infection, radial sensory nerve injury, reflex sympathetic dystrophy and recurrence.
- To evaluate the intensity of pain after surgery using VAS score.
- To assess the effectiveness of surgery by modified Mayo wrist score.

## 3. MATERIALS AND METHODS

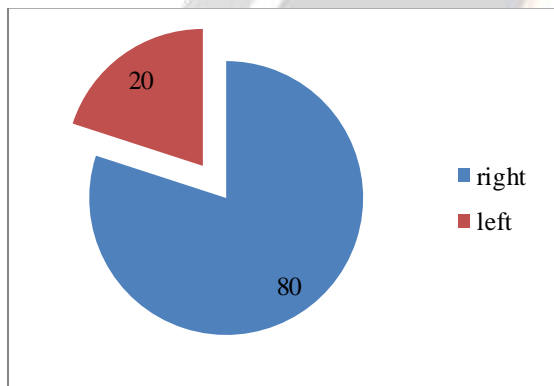
Following the ethical clearance from the Institutional Review Board of Pokhara Academy of Health Sciences, prospective observational study was conducted at Western Regional Hospital (WRH), Pokhara. Informed written consent was obtained in either Nepali or English language whichever they felt comfortable assuring full confidentiality. A detailed proforma of the participants including name, age, gender, occupation, educational status, size of family, family history of De Quervain's disease, complications of surgery were prepared.

All the patients coming to Outpatient Department (OPD) of Western Regional Hospital, Pokhara in patient of age group 16-60 years who didn't improve with conservative treatment after a period of 6 weeks underwent surgical release for the De Quervain's tenosynovitis. Patients with other pathologies in the wrist, skin lesions (scabies, eczema), cervical radiculopathy, prior fractures, nonunion or direct trauma to distal radius and radial styloid, patient below 16 and above 60 years and patients with diabetes mellitus, gout and rheumatoid arthritis were excluded from the study. All the participants underwent detailed physical and clinical examination. Pre-operative intravenous first generation cephalosporin (cefazolin) antibiotic was given 30 minutes prior to surgery. Release of the first dorsal compartment was done followed by suturing of the incised skin with pressure bandage. First dressing was done on second Post operative day (POD). Thumb and hand motion were encouraged immediately except for forceful wrist flexion. Suture removal was done on 14<sup>th</sup> POD and Patients were followed up clinically at 2 weeks, 3 months and 6 months.

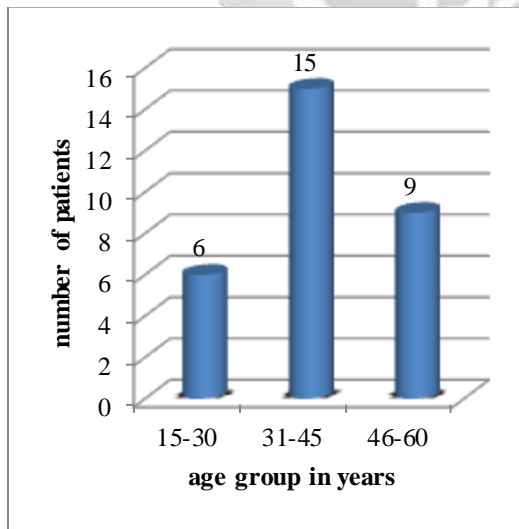
Pre and Post operative clinical evaluation was done by Finkelstein test, Modified Mayo Wrist score and VAS score. The collected data were stored in an electronic database(MS-Excel Sheet) . Statistical analyses were performed with statistical software (SPSS 20.0 for windows).Descriptive statistics like frequency, percentage, mean, standard deviation was computed. Inferential statistics like chi-square test was applied to find the significant difference between functional outcome of surgical release of dequervain’s disease with the independent variables. Appropriate figures and tables were made during the data analysis.

**4. RESULTS**

Out of 30 patients taken into study,27(90%) were female and 3(10%) were male with female:male ratio of 9:1. 17(57%) were right hand and 13(43%) were left hand involvement and 24(80%) were right hand dominant and 6(20%) were left hand dominant which is shown in Figure 1. Maximum number of patients allocated in our study falls in age group of 31-45 years with mean age group being 40.2 years(50%) followed by age group of 46-60 years(30%) with least number in age group of 15- 30 years (20%) which is shown in Figure 2. 20 cases (66.67%) were house wives,6(20%) were student,3(10%) were job holders.53.3% patients had symptoms of duration 6-12 months followed by one year duration(13.3%) and least in less than six months duration(13.3%) which is shown in Figure 3.Duration of surgery was in the range of 10-25 minutes with mean time of 12 minutes. Time taken to return to job was within six weeks with mean duration of 2 weeks.2 patients had persistent pain however, it was managed with analgesics. Preoperative VAS score 7.4 that improved to 2.1 at 2 weeks Postoperatively(POD),1.43 at 6 weeks and 1.13 at 6 months which is shown in Table 1. 26(86.67%) had excellent ,3(10%) had good and 1(3.33%) had fair results at 6 months follow up which was analysed by Modified Mayo Wrist Score which is shown in Table 2.



**Figure 1: Pie chart showing hand dominance**



**Figure 2: Bar diagram showing age distribution**

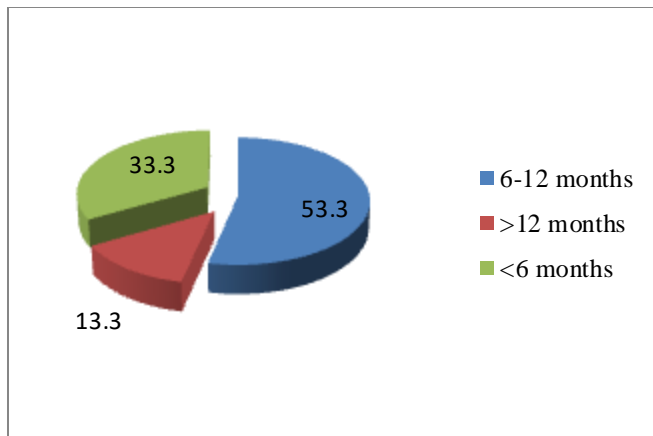


Figure 3: Pie diagram showing duration of symptoms

	pre-operatively	2 weeks post-operatively	6 weeks post-op	6 months post-op
VAS score	7.42	2.1	1.43	1.13

Table 1: VAS Score

Modified Mayo score	Number of cases	Percentage	Mean Score
Excellent	25	83.3%	91.3
Good	3	10%	
Fair	2	6.66%	
Poor	0		
Total	30	100	

Modified Mayo Score at 2 weeks

Modified Mayo score	Number of cases	Percentage	Mean Score
Excellent	25	83.33%	94.43
Good	3	10%	
Fair	2	6.66%	

<b>Poor</b>	<b>0</b>		
<b>Total</b>	<b>30</b>	<b>100</b>	

**Modified Mayo score at 3 months**

<b>Modified Mayo score</b>	<b>Number of cases</b>	<b>Percentage</b>	<b>Mean Score</b>
<b>Excellent</b>	<b>27</b>	<b>93.33%</b>	<b>96.3</b>
<b>Good</b>	<b>1</b>	<b>3%</b>	
<b>Fair</b>	<b>2</b>	<b>6.66%</b>	
<b>Poor</b>	<b>0</b>		
<b>Total</b>	<b>30</b>	<b>100</b>	

**Modified Mayo Score at 6 months**

## 5. DISCUSSION

De Quervain's disease can cause serious disability and absence from work due to impaired functioning of the wrist and hand. Many conservative treatment modalities have been described and when conservative treatment implemented for 6 weeks fails, operative treatment should be considered[3].

In this study, female: male ratio in this study was 9:1 which is almost the same as reported by other authors and our study. Zarin and Ahmed reported female to male ratio of 9:1 [4]. Bouras et al. reported mean age was 49 years with net female predominance[5]. The higher risk of de Quervain tenosynovitis in women could reflect both biological predispositions (hormonal effect) and overexposure to biomechanical repetitive work-related constraints (gender effect)[6].

The mean age of patients in this study was 40.2 years (range: 15-60 years) which was comparable to study done by Muhammad Azeem et al[7] that reported mean age of 39 years. This shows that de Quervain's tenosynovitis is a disease of the people of productive age group. Hence, it has serious economic impact.

In this study, dominant hand was involved in sixty percent of the cases. Right hand was involved in 57% cases and left hand in 43% cases. However, Gousheh j et al [8] study showed 80 percent of the cases in non dominant hand and only 20% of the cases in dominant hand.

In this study, 20 out of 30 (66.67%) patients were housewives which differed from the study done by Zarin M et al.[4] reported that all females were housewives.

In this study, the average duration of surgery was 12 minutes with range 10-25 minutes. Other studies have not outlined their duration of surgery.

In this study, all patients improved clinically and returned to their works. The average duration to return to their work was 2 weeks.

There was no complications in 28 patients in this study however, 2 patients (6.67%) had persistent pain over the first dorsal compartment which was managed with analgesics which was similar to the study done by Bouras Y et al. [5] which reported no complications in his study involving 20 patients. However, study done by Altay MA et al. [3]



reported 2 cases with wound infection among 42 patients and study done by TA KT et al. [9] reported severe recurrent wrist pain (23%), wrist weakness (5%), scar tenderness (14%), numbness and tingling at the site of surgery.

During surgical procedure, different anatomical variations of the first extensor compartment were found. Five patients had duplication of abductor pollicis longus tendon. Harvey FJ[10] reported that extensor pollicis brevis tendon was in a separate compartment in 10 cases out of 79 wrists in 71 patients. Katsunori Yuasa and Yoshiro Kiyoshige[11] reported that sixteen patients had a septum in the first extensor compartment and 6 patients had a single canal. Jamal Gousheh et al. [8] reported that the compartment is completely separated into two canals in 86% of the patients, which is significantly higher than that reported in similar studies.

Such variation could lead to two possible misinterpretations during the course of surgical decompression for de Quervain's tenosynovitis and these misinterpretations could reasonably be linked with the failure rate for this particular operation.

1. The finding of the abductor pollicis longus and its accessory tendon in a single compartment after a limited surgical incision could be mistaken for the abductor pollicis longus and extensor pollicis brevis tendons. Such a mistake would lead to failure to decompress the extensor pollicis brevis.
2. A failure to identify the deeper-lying separate canal for the extensor pollicis brevis in the distal part of the compartment would again be responsible for failure to decompress the extensor pollicis brevis.

VAS score improved from 7.4 to 1.13 at six months follow up in this study. This improvement in VAS score is comparable to other studies. Lee HJ et al. [12] described post operative VAS score 1.33 and Altay et al.[3] reported 1.5. H. J. Kang et al. [13] reported that mean VAS pain score was improved from an initial of 6.4 to 0.5 in open release group. In our study, modified Mayo score was 40.53 preoperatively which improved to 91.3, 94.43 and 96.3 at 2 week, 3 months and 6 months follow up respectively. Out of thirty patients, 26 patients had excellent results, 1 had good and 2 had fair results at 6 months follow up. No other study was done using modified Mayo's score.

### **Limitations of the study**

Limitations of the study were small sample size with follow up being done only for 6 months .Study was carried out in a single hospital and Pain assessment was done by VAS score which is a subjective scoring tool. Similarly, Patients with conditions like gout, rheumatoid arthritis, uncontrolled diabetes and other conditions mimicking the dequervain's disease were excluded from the study. So the results in patients with these conditions could not be interpreted. Comparison with the control group could have given better vision with regard to outcome which lacked in our study.

### **CONCLUSIONS**

De Quervain's tenosynovitis is a disease of the younger population, leading to severe disability and loss of productivity. Though conservative management options are available, there is often recurrence of pain. Functional outcome of surgical release of refractory de Quervain's disease is excellent with minimum complications. Surgery should be considered in those patients who do not respond to conservative treatment up to 6 weeks.

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