

## The Impact of the Tubiana Classification System on the Prognosis for Surgical Treatment of Dupuytren's Contracture: Mid-Term Results of Partial Fasciotomy

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**Citation:** Harun Mutlu, Serhat Mutlu, Ersin Kuyucu, Mehmet Umit Cetin, Atila Parmaksızoğlu and Mehmet Erdil (2016) The Impact of the Tubiana Classification System on the Prognosis for Surgical Treatment of Dupuytren's Contracture: Mid-Term Results of Partial Fasciotomy. Ann Surg Int 2: 017.

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### Abstract

**Purpose of the Study:** The aim of this study is to evaluate the hand functions and mid-term results of partial fasciectomy and to investigate the impact of the Tubiana classification system on the prognosis of this pathology.

**Patients and Method:** We retrospectively evaluated 28 patients with open partial fasciectomy performed. The patients at stage-1 or above according to Tubiana classification were operated.

**Results:** The mean age of the 28 patients was 60.8 years. The patients were followed up for an average of 60 months.. Seventeen cases (60.7%) were classified as stage-1 according to Tubiana Classification. Mean pre-operative MCP joint contracture was 28.75° whereas PIP joint contracture was 25.18° At the final follow-up after surgery the mean contracture of the MCP joint was 5.96° whereas PIP joint of 5.79° and these reductions were statistically significant (p< 0.05)

**Discussion:** In our study, we evaluated the partial fasciectomy patients staged I and above according to Tubiana Classification. According to this system most of our cases were Tubiana stage-1 and in this group no patient developed recurrence after operation. The more noteworthy situation is that in our 2 cases with Tubiana stage-4 given partial fasciectomy both developed recurrence..

**Keywords:** Dupuytren's contracture; Complications ; Prognosis.

## Introduction

Dupuytren's contracture is a proliferative dysplasia with progressive contracture of the finger joints due to nodules and cords developing in the subcutaneous palmar tissue [1]. The etiology is not fully known; however it is thought that genetic factors play a role [2]. Common risk factors include advanced age and diabetes mellitus especially, though epilepsy and alcohol dependency should also be noted [3,4].

The disease begins with thickening of the palmar skin and development of nodules. Though treatments such as stretching and triamcinolone acetonide or collagenase injections may be applied in the early period [4,5], when the contracture progresses when the contracture of the proximal interphalangeal (PIF) joint is 15-20° and especially the metacarpophalangeal (MP) joint is 30°, surgical treatment is required [4,6]. In the literature there is controversy about the surgery time and the prognostic factors. Additionally revision surgery etiology is not clear. Among surgical choices, there are many choices such as closed fasciectomy, open partial-complete fasciectomy, dermofasciectomy and amputation [7]. Partial fasciectomy is a frequently applied surgical technique because it reduces wound complications with a less invasive dissection and eliminates restrictions due to wide dissection after the operation [8].

The aim of this study is to evaluate the hand functions and mid-term results of partial fasciectomy and to

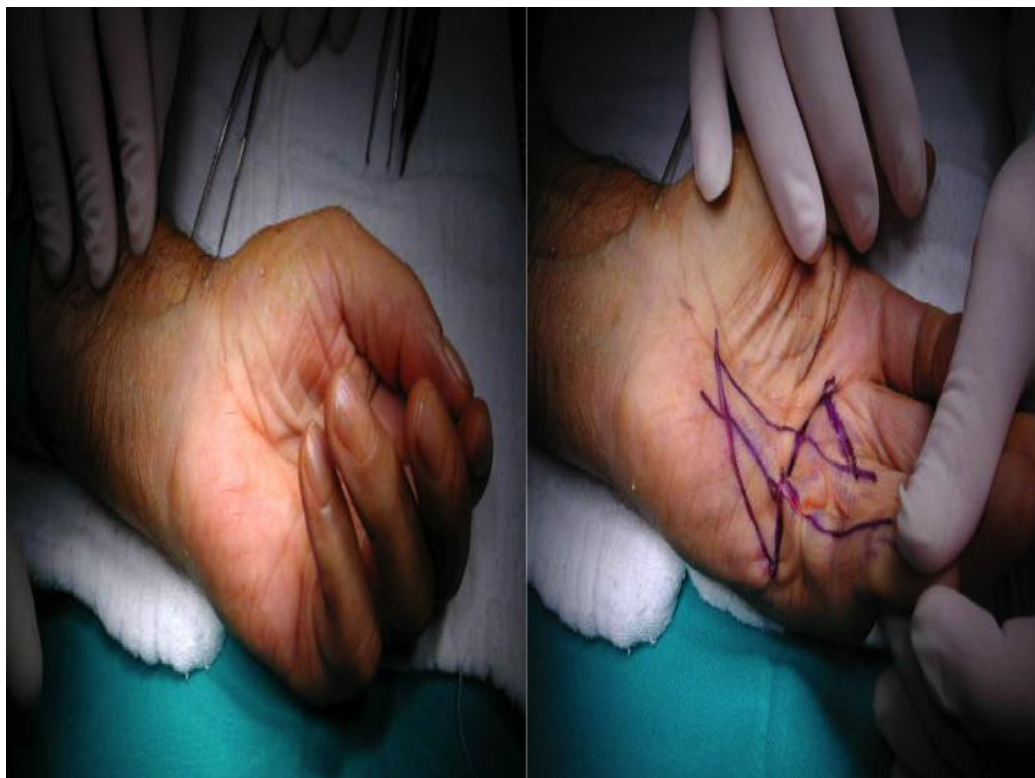
investigate the impact of the Tubiana classification system on the prognosis of this pathology

## Patients and Method

We retrospectively evaluated 28 patients (21 male, 7 female) with open partial fasciectomy performed between September 2002 and January 2010 for Dupuytren's contracture. Our study group consisted of the patients age above 18 years old without previous surgery and the patients at stage-1 or above according to Tubiana classification system (Figure 1). Patients applying with nodules or thickening in fingers or palm, patients with previous surgical treatment were excluded from the study. Diagnosis and staging of Dupuytren's contracture was completed with the Tubiana classification system [10].

All patients underwent open partial fasciectomy (Figure 2). Operations were performed under general or axillary block anesthesia under tourniquet control. Skin incisions in Z-plasty fashion extended to natural palmar and digital creases. Pathological fascias causing contracture of the fingers were excised and the full ranges of motions were obtained intraoperatively. All data were prospectively collected and retrospectively reviewed. Data included demographic information (age, gender, and family history, number of affected fingers (Table 1), previous hand-forearm trauma and risk factors), complications, MP and PIP joint extension gains and follow up results (Table 3). In order to evaluate the patient's hand functions, Q-DASH functional scoring was used [9].

**Figure1:** Male patient 56 years, Tubiana Stage-1



**Figure 2:** Intraoperative image of the same patient and excised nodules



**Table 1:** Distribution of affected fingers

Distribution of affected fingers	
3rd finger	2 (7.1%)
4th finger	10 (35.7%)
5th finger	9 (32.2%)
4-5th finger	7 (25%)

**Table 3:** MP and PIP joint contracture values

Preoperative MP	Postoperative MP	p
28,75 ± 9,59	5,96 ± 4,83	<0,001
25 (20-50)	4 (3-20)	
Preoperative PIP	Postoperative PIP	p
25,18 ± 25,40	5,79 ± 6,83	<0,001
15 (10-90)	2 (1-25)	

## Results

The mean age of the 28 patients (21 male, 7 female) (M/F=3) was 60.8 years (41-76 ± 8.7 SD). The patients were followed up for an average of 60 months (36-98 months) (Figure 3). In 23 cases (82.1%) there was accompanying hypertension, while 13 cases (46.5%) had

accompanying diabetes mellitus. In 18 cases (64.3%) the right hand was affected while in 10 cases (37.7%) the left hand was affected. The most frequently affected finger was the 4th finger (10 cases 35.7%). Seventeen cases (60.7%) were classified as stage-1 according to Tubiana Classification (Table 2).

**Figure 3:** Functional images of the same patient at check-up 1 year postoperative



**Table 2:** Distribution according to Tubiana Classification

Distribution according to Tubiana Classification	
Stage-1	17 (60.7%)
Stage-2	6 (21.5%)
Stage-3	3 (10.7%)
Stage-4	2 (7.1%)

Mean pre-operative MCP joint contracture was 28.75° (20-45° ± 9.59 SD) whereas PIP joint contracture was 25.18° (5-25° ± 25.40 SD). At the final follow-up after surgery the mean contracture of the MCP joint was 5.96° (3-15° ± 4.83 SD) whereas PIP joint of 5.79° (1-25° ± 6.83 SD) and these reductions were statistically

significant ( $p < 0.05$ ) (Tables – 3,4). In the postoperative period 1 case had superficial necrosis of the z-plasty site and surgical debridement was performed. None of the patients had digital nerve injury and skin graft requirement was performed. Stitches were removed mean of 14<sup>th</sup> day of the operation (11-21). Two patients (7.1%) had recurrence of 9 months and 11 months of surgery.

From the third day of the operation active ROM exercises were began and for three months an extension night splint was used. The Q-DASH functional average scores were 36.6 (25-85°±25.3 SD) preoperatively. At the

final follow-up, the Q-DASH functional scoring of patients was questioned and the average results were 10.2 (0-37.5°±10.79 SD).

**Table 4:** MP and PIP joint values according to the Tubiana classification stages

	Preoperative MP	Postoperative MP	p
<b>STAGE 1</b>	22,19 ± 2,56 20(20-25)	3,31 ± 0,48 3(3-4)	<0,001
	Preoperative PIP	Postoperative PIP	
	11,56 ± 2,39 10(10-15)	1,81 ± 0,40 2(1-2)	<0,001
	Preoperative MP	Postoperative MP	
<b>STAGE 2</b>	31,43 ± 3,78 30(25-35)	6,29 ± 4,50 4(3-15)	0,017
	Preoperative PIP	Postoperative PIP	
	19,29 ± 4,50 20 (15-35)	6,86 ± 4,81 4 (3-15)	0,018
	Preoperative MP	Postoperative MP	
<b>STAGE 3 and 4</b>	46,00 ± 4,18 45(40-50)	14,00±4,18 15(10-20)	0,041
	Preoperative PIP	Postoperative PIP	
	77,00 ± 12,04 70(65-90)	17,00 ± 7,58 15 (10-25)	0,041
	Preoperative MP	Postoperative MP	

## Statistical Methods

The descriptive statistics of the continuous variables in the study are given as mean, standard deviation, minimum and maximum values while descriptive statistics of categorical variables are shown as frequency and percentage. For two group comparisons of variables with normal distribution the sample T test was used, while the variables without normal distribution were compared with the Mann Whitney U test. All statistical analyses accepted a p value below 0.05 as statistically significant.

## Discussion

In Dupuytren contracture, the fibroblasts of the palmar fascia have higher amounts of actin compared to normal fibroblasts and this causes pathological contraction [4,8]. In this study, we evaluate the hand functions and mid-term results of partial fasciectomy and we investigate the impact of the Tubiana classification system on the prognosis of this pathology.

As described in the literature, Dupuytren's contracture is observed most after the fourth decade, and up to 9 times more frequently in men [11,13]. In our study, similarly, most of our patients were in the 5th and 6th decades (average age 60.8) and we had three times more male patients than female patients. As the disease progresses, the contraction of the palmar fascia causes fixed flexion deformity of the PIP and MCP joints and finger function reduces. In the initial stage before contracture occurs even if monitoring is appropriate, in the period of contracture and nodule formation an invasive procedure is required. Recently in the literature minimally invasive treatments such as clostridium collagenase and triamcinolone acetonide injections have gained popularity. Though Thomas et al. and Ketchum et al. in studies of collagenase and triamcinolone acetonide, respectively, reported obtaining successful results for Dupuytren disease, as there are still no long-term results surgery remains the gold standard for treatment [11 - 13].

Additionally, as stated in a study by Vollbach et al. though collagenase administration increased patient satisfaction compared to surgical choices, the recurrence rate of infections 1 year later was higher[19]. In our clinic with all these causes we use the invasive surgical choices for treatment of Dupuytren's contracture.

For surgical treatment there are many choices such as fasciotomy, partial (selective) fasciectomy, radical fasciectomy, segmental aponeurotomy, dermofasciectomy and amputation and all have advantages and disadvantages [13,14]. Partial fasciectomy is an accepted procedure even though not all diseased fascia are removed as it provides good functional results, low recurrence rates and low complication rates and is a frequently applied surgical choice [13, 15]. As stated by Maricevic et al., who found this rate was 9% in a 102 case series, partial fasciectomy is a very effective surgery [20]. In our study, we evaluated the partial fasciectomy patients staged I and above according to Tubiana Classification.

Recurrence and complications are significant problems in the treatment of Dupuytren's contracture and rates are reported from 30 to 80% [14, 16]. In our series, we had 1 minor complication (wound closure problem) and recurrence developed in only 2 of our study group (7.1%); this is very low compared to the literature. This may be due to the short-term follow up. Digital nerve injury is a deteriorating complication that reduces patient satisfaction and though observed at rates of 1-7% [4]. We did not experience any digital nerve injury in our study.

Tubiana et al. described a simple classification system used to categorize Dupuytren disease [13, 17]. According to this system most of our cases were Tubiana stage-1 and in this group no patient developed recurrence after operation. The more noteworthy situation is that in our 2 cases with Tubiana stage-4 given partial fasciectomy both

developed recurrence. From this point of view, we consider the Tubiana classification system to be an effective classification system to indicate both prognosis and the time for surgical treatment. To the best of our knowledge there is no study in the literature emphasizing this characteristic of the Tubiana classification system. Comparing surgery completed at Tubiana stage 3-4 with those at stage 1-2 postoperatively, the MP joint and PIP joint values were better in those with surgery at the early stage (stage 1-2) by statistically significant amount (Table3). While all groups had a statistically significant improvement in joint movement angles, this improvement was more significant at Tubiana stage 1 and 2 (Table4).

In this context, we particularly recommend surgical treatment for Dupuytren's contracture, even in the early stage.

When we evaluated hand function results in the mid-term in our series, the MCP joint regained 79% motion while the PIP joint regained 65% motion. Tubiana stage 3-4 cases were not observed to have limitations on mid-term monitoring including Q-DASH scores. The final check-up of all cases had average Q-DASH results measured as 3.85 (0-37.5). There was a statistically significant degree of reduction in Q-DASH scores.

The most significant limitations of our study are the retrospective nature, small sample size and lack of long-term results.

## Conclusion

In the surgical treatment of Dupuytren's partial fasciectomy is a good option with low complication and recurrence rates and with good functional outcomes in the mid-term. Furthermore, Tubiana classification is a simple classification system with good reliability for prognosis and surgery time in the Dupuytren's contracture.

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