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Dupuytren's contracture: A demographic, retrospective analysis

Alper Çıraklı*, Ahmet Pişkin, Murat Erdoğan, Ali Varlı, Serdar Ulusoy

Department of Orthopedics and Traumatology, Faculty of Medicine, Ondokuz Mayıs University, Samsun, Turkey

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*** Correspondence to:**
Alper Çıraklı,
Department of Orthopedics and Traumatology,
Faculty and Medicine,
Ondokuz Mayıs University,
Samsun, Turkey
e-mail: alperomu@gmail.com

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ABSTRACT

Dupuytren's contracture is a pathological contracture of the palmar fascia which results in flexion deformity in the fingers, causing restricted movement. It is most frequently seen in elderly males, most commonly in the 4th and 5th fingers. Although the etiology of the disease is not fully known, various factors are held responsible. As there is fascia involvement, it may be seen in different areas of the body. Treatment includes conservative and surgical methods. It is important that the surgical site includes neighbouring nerves and blood vessels. This study comprised 23 cases treated with partial fascietomy for Dupuytren's contracture at our clinic between January 2005 and January 2013. All the patients passed through the postoperative period without any problems. We recommend making a partial fasciectomy to include excision of only the diseased fascia to reduce the risk related with nerves and vessels. This can also be considered to have great importance in the postoperative rehabilitation, the success of the treatment and the prevention of recurrence.

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1. Introduction

Dupuytren's contracture is a pathological contracture of the palmar fascia causing the fingers to bend towards the palmar area (Özkaya et al., 2010). This deformity was first noticed by Felix Plater in the hand of a labourer in 1614 (Yenidünya et al., 2010). The disease was defined as a deformity of the palmar fascia by Guillaume Dupuytren in 1832 (Yenidünya et al., 2010)

The disease is most frequently seen in elderly males living in Northern Europe and the incidence in this geographical area varies from 2% to 42% (Rayan, 1999). Incidence generally increases with increasing age and is most often seen in males aged 50-70 years (McGrouther, 1999). Although the etiology is not fully known, several systemic diseases and habits have been defined as causing or accompanying the disease (Özkaya et al., 2010).

Thickening of the palmar skin and speckled pitting are accepted as the first signs of the disease (Özkaya et al., 2010). Clinical classification of the disease comes in three stages of early, active and advanced stages (Yenidünya et al., 2010). The corresponding clinical findings consist of nodule, contracture and tendon-like band respectively (Saar and Grothaus, 2000).

As systemic diseases and habits create a predisposition for the formation of Dupuytren's contracture, variations in incidence are seen in different societies and cultures. This study aimed to evaluate surgically treated cases with the relevant literature.

2. Research method

The study comprised 23 cases treated with partial fasciectomy for Dupuytren's contracture in our clinic between January 2005 and January 2013. The cases were examined in respect of age, gender, side, etiological factors, accompanying systemic diseases and habits and surgical treatment results. The data obtained were analysed with the SPSS 20.0 (SPSS Inc., Chicago, IL, USA) software program.

The methods of anaesthesia used were, regional intravenous anaesthesia (RIVA), upper extremity block with regional anaesthesia formed from local anaesthesia and general anaesthesia. In all cases, following the application of a tourni-

quet, a Z-incision was made and partial fasciectomy was performed including the diseased area. The tourniquet was deflated and after checking the blood flow and circulation in the fingers by movements, the incision was closed and a penrose drain was applied. On the 2nd postoperative day, movements were started and a splint was applied to keep the fingers in extension for approximately three weeks, then a night splint was applied for approximately three months.

3. Results

The cases included in the study were 18 (78.2%) males and 5 (21.8%) females with a mean age of 60 years (range 41-72 years). Only two cases were below the age of 50 years (41 years and 48 years). The disease was in the right hand in 15 (65.2%) cases and in the left hand in eight (34.8%) cases. There was single finger involvement in 17 (73.9%) cases and two finger involvement in six (26.1%) cases. The most commonly involved fingers were the 4th (12 cases) and 5th (10 cases) fingers. In one case aged 64 years with 4th and 5th finger involvement, intervention was also made for carpal tunnel syndrome and trigger finger. The general characteristics of the patients are summarised in Table 1.

Examination of accompanying systemic diseases and habits revealed cigarette smoking in 60.8%, alcohol use in 34.7% and diabetes in 30.4% of cases. There was barbiturate use for liver disease and epilepsy in 4.3% and family history in 8.6% of cases (Table 2).

Variations were seen in the anaesthesia used according to the systemic condition of the patient and the patient's own wishes; regional anaesthesia was applied to 17 (73.8%) cases as RIVA, upper extremity block and local anaesthesia and general anaesthesia to six (26.1%) cases (Table 3).

The treatment method in this study was a partial fasciectomy including the diseased area using a Z-incision. All the patients passed through the postoperative period without any problem. No wound site infection, haematoma or necrosis was observed in any patient.

Table 2. Dupuytren's disease accompanying systemic diseases and habits

Factors	No of patients	%
Cigarette smoking	14	60.8
Alcohol	8	34.7
Diabetes mellitus	7	30.4
Liver disease	1	4.3
Epilepsy	1	4.3
Family history	2	8.6

4. Discussion

Dupuytren's contracture develops as a result of pathological contracture of the palmar fascia. This deformity was defined as a disease of the palmar fascia by Guillaume Dupuytren in 1832 (Yenidoğan et al., 2010). Although the etiology is not fully understood yet, several systemic diseases and habits have been defined which cause the disease to occur (Özkaya et al., 2010). It has been reported that the disease is often seen in Northern Europe and rarely in Japan (Rayan, 1999; Yenidünya et al., 2010), which may be related to societal and cultural differences.

Table 3. Anaesthesia methods used for surgery

Anaesthesia method	No of patients	%
RIVA	8	34.8
Upper extremity block	6	26.1
Local anaesthesia	3	13
General anaesthesia	6	26.1

Dupuytren's contracture is most often seen in males aged 50-70 years (McGrouther, 1999). In the current study,

Table 1. General characteristics of the patients

No	Age	Gender	Side	Finger	Occupation	Accompanying diseases/habits
1	50	M	Right	5	Clerk	C, A
2	73	M	Right	3	Farmer	C
3	48	F	Left	3-4	Clerk	C
4	59	M	Right	4	Retired Clerk	C, A
5	72	M	Right	4	Farmer	-
6	67	F	Right	4	Farmer	-
7	71	F	Right	4	Farmer	DM
8	58	M	Right	4	Labourer	C, A
9	63	M	Left	4-5	Farmer	A
10	71	M	Right	5	Farmer	DM
11	55	F	Right	3-4	Housewife	FH, DM
12	52	M	Right	4-5	Clerk	C
13	55	M	Right	5	Retired Clerk	DM, C, A, LD, E
14	55	M	Left	4	Retired Clerk	C
15	64	F	Right	5	Farmer	C
16	62	M	Left	2-4	Farmer	C
17	64	M	Left	4-5	Labourer	DM, C, A
18	61	M	Right	5	Farmer	DM
19	41	M	Left	5	Clerk	FH, C, A
20	62	M	Right	5	Retired Clerk	DM
21	63	M	Right	4	Farmer	C
22	59	M	Left	4	Labourer	C, A
23	57	M	Left	4	Retired Clerk	-

Abbreviations: FH (Family History), **DM** (Diabetes Mellitus), **C** (Cigarette smoking), **A** (Alcohol), **LD** (Liver Disease), **E** (Epilepsy and Medication Use)

it was seen 3.6 times more in males than females and the mean age was determined as 60 years (range 41-72 years) with only two cases aged below 50 years. The incidence of Dupuytren's contracture has been reported to be on the ulnar side with the most common involvement of the 4th finger (Luck, 1959; Dominguez-Malagon et al., 1992; Yenidünya et al., 2010). Moreover, it has been emphasised that radial side involvement has a slower course (Marcuzzi et al., 2009). In the cases of the current study, the most common involvement was observed to be in the 4th finger (12 cases), followed by the 5th finger (10 cases).

Although the etiology is not fully understood yet, several systemic diseases and habits have been defined which cause the disease to occur (Özkaya et al., 2010). Among these are *Diabetes mellitus*, alcohol consumption and/or cigarette smoking, myocardial infarction, long-term barbiturate use for epilepsy and liver diseases (Spring et al., 1970; Zachariae, 1971; Arafa et al., 1992; Chammas et al., 1995; Balcı et al., 1999; Arkkila et al., 2000) Neumüller et al. (1994) showed that as Dupuytren's contracture is an autosomal dominant transfer disease showing variable penetration, there was an evident synergy with HLA-DR3 antigen. In the literature, family history varies between 12.5% and 26% (McFarlane, 1982; Boyer and Gelberman, 1999).

Trauma is also among the factors held responsible for the etiology. However, this pathology in the fascia may be seen in the same patient in the finger dorsum, the penis dorsum and the plantar fascia (Koçer et al., 1993). In the current study, there was conformity with literature in that cigarette smoking was determined in 60.8% (14 cases), alcohol consumption in 34.7% (8 cases) and diabetes in 30.4% (7 cases). There was also barbiturate use for liver disease and epilepsy in 4.3% (1 case). In one case aged 55 years with 5th finger involvement, all the factors apart from family history were present. There was family history in 8.6% (two cases), which was a low rate compared to literature. Although there was no reported history of specific trauma, it was seen that an occupational group had the characteristics of repeated trauma. The pathology in the fascia was not seen in any different areas of the body in any case.

Thickening of the palmar skin and speckled pitting are accepted as the first signs of the disease (Özkaya et al., 2010). Clinical classification of the disease comes in three stages of early, active and advanced stages (Yenidünya et al., 2010). The corresponding clinical findings consist of nodule, contracture and tendon-like band respectively (Saar and Grothaus, 2000). Pain may accompany these findings. All the cases in the current study were advanced stage cases, consisting of contracture and tendon-like bands causing the deformity.

The aim of treatment is to remove the contracture of the fascia, correct the flexion deformity and regain the function of the finger. Treatments include conservative and surgical methods.

Conservative treatment includes physical therapy modalities and steroid injections. Localised steroid injection has been reported to be able to reduce the need for surgical intervention and there was a regression of the pathology in 10% of patients (Trojian and Chu, 2007). Collagenous injection, known as enzymatic fasciotomy, has also been mentioned as a different approach. Conservative methods are generally known to be able to be used in early stage cases.

Surgical treatment choices are fasciotomy, fasciectomy and amputation. When fasciotomy is evaluated, percutaneous fasciotomy was reported by Sir Astley Cooper in 1823 and open fasciotomy by Dupuytren in 1832 (Koçer et al., 1993). Fasciotomy is preferred for elderly patients who are not in good general health and who would not tolerate a more extensive approach; an incision is made to the fascia with the aim of reducing the symptoms from there. Fasciectomy was recommended by Goyran in 1933 (Koçer et al., 1993). The subject of debate today is how much of the fascia is to be excised. Local fasciectomy was described by Gonzales in 1981 (Koçer et al., 1993). This consists of the excision of one segment. Partial fasciectomy consists of excision of the diseased fascia by making a zigzag incision along the contracture band on the skin. Total fasciectomy is known as the McIndoe procedure (Koçer et al., 1993) and is the total excision of extensively involved fascia. Dermofasciectomy was reported by Hueston in 1982 (Koçer et al., 1993). This consists of the removal of the fascia together with the skin and repair of the defect with grafting in advanced cases with skin involvement or those showing recurrence. In literature, recurrence has been reported to have been seen less often in cases where dermofasciectomy has been applied (Howard, 1959; Hall et al., 1997). Amputation may be preferred in cases where there is no postoperative function or when more than one operation has been unsuccessful (Tonkin et al., 1985). Of these treatments, partial fasciectomy is the most widely used method (Özkaya et al., 2010). However, it has been thought that the type of operation is not related to the progression of the disease (Moermans, 1991).

The treatment method used in the current study was the most frequently used surgical method of partial fasciectomy because all the cases were at advanced stages with deformity. This can be explained by the fact that our hospital is a tertiary stage healthcare centre so surgically difficult and high risk cases are directed here.

Variations were seen in the anaesthesia used according to the systemic condition of the patient and the patient's own wishes; regional anaesthesia was applied to 17 (73.8%) cases as RIVA, upper extremity block and local anaesthesia and general anaesthesia to six (26.1%) cases. Although regional anaesthesia provides an advantage in terms of pain in the postoperative period, all the patients were monitored in the hospital for at least one day in respect of bleeding and circulation. One study has reported successful treatment without a tourniquet and using local anaesthesia (Denkler, 2005). In the current study, a tourniquet was used on all the cases as a blood-free environment was thought to be safer with regard to vascular and nerve damage.

Postoperative rehabilitation affects the success of the treatment to a great degree, as intensive physical therapy and the application of a splint reduces recurrrence (Özkaya et al., 2010). In the literature, the rate of recurrence requiring surgery has been reported as between 0% and 71% (Bulstrode et al., 2005; Swartz and Lalonde, 2008). In the current study, movements were started on the 2nd postoperative day and a splint was applied to keep the fingers in extension for approximately three weeks, then a night splint was applied for approximately three months. No recurrence occurred in any case during the follow-up period.

Surgical complications which may occur intraoperatively

or postoperatively are digital artery and nerve damage, haematoma, infection, wound opening, necrosis and reflex sympathetic dystrophy (McFarlane, 1982; Boyer and Gelberman, 1999). Apart from these, it has also been reported that the condition which is the reverse of reflex sympathetic dystrophy, known as Dupuytren's fire, may be encountered (Saar and Grothaus, 2000). All the cases in the current study passed a problem-free postoperative period. No wound site infection, haematoma or necrosis was observed in any case.

Knowledge of the characteristics of Dupuytren's disease and the predisposing factors allow for the application of early surgical intervention before a deformity develops. In the selection of technique to be applied, the patient's age, general health status, severity of the contracture and the patient's wishes must be taken into consideration. In addition, knowledge of the course of the disease, the risk of recurrence and rehabilitation are of great importance.

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