

# Results of Surgical Treatment of Dupuytren's Disease in Women: A Review of 109 Consecutive Patients

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**Purpose:** Dupuytren's disease is not as commonly reported in women as in men. Our literature search yielded only two such studies. The purpose of this study was to further examine the presentation and surgical outcome of Dupuytren's disease in women, including complications and to compare these outcomes to a similar cohort of men and to previous studies of Dupuytren's disease in women.

**Methods:** A retrospective case series review was undertaken, and we identified all women who were admitted for surgical correction of Dupuytren's disease since 1990. Comparison was made with men operated during the same period. Pre- and postoperative measurements for lack of extension at the metacarpophalangeal joint (MCPJ), proximal interphalangeal (PIP) joint, and distal interphalangeal (DIP) joint were made by the senior author. SPSS (Statistical Package for the Social Sciences, SPSS Inc., Chicago, Il) was used for statistical analysis. The *t* test was used to compare the two groups.

**Results:** One hundred nine women were identified, with 119 operated hands, out of a total of 657 patients operated. Comparisons were made with 548 men. The average age at presentation was 63 years in women, and there was no significant difference between the two groups. One hundred five of the patients had digital involvement. The little and ring fingers were involved most frequently. Thirty-four had involvement of the MCPJ. Mean preoperative contracture was 35°. Mean postoperative contracture was 1°. Proximal interphalangeal joint involvement was seen in 66 patients. Mean preoperative contracture was 42°. Mean postoperative contracture was 7°. Distal joint involvement was identified in only 4 digits. There was no statistical difference with the men as regards digital involvement and joint involvement; however, correction at the PIP joint was significantly lower. Fasciectomy was performed in 107 cases (90%), fasciectomy and local flap in 7 cases (6%), and dermafasciectomy in 5 cases (4%). The most common complication was digital nerve/artery injury (6 patients), and disease recurrence rate was 22%. These were statistically similar to the men.

**Conclusions:** Dupuytren's disease is less prevalent in women but its symptomatic presentation is similar to that in men, with more severe involvement of the PIP joint and a similar recurrence rate. The surgical outcomes, however, were equivalent with regard to final contracture correction, recurrence, and complication rates. (*J Hand Surg* 2007;32A:1423–1428. Copyright © 2007 by the American Society for Surgery of the Hand.)

**Type of study/level of evidence:** Prognostic II.

**Key words:** Dupuytren's disease, females, surgery, splint, proximal interphalangeal joint, flare reaction.

Dupuytren's disease is more prevalent in men; however, it is generally accepted that in the ninth decade men-to-women ratio is equal.<sup>1</sup> The disease is more prevalent in the Caucasian population, and the highest incidence is in Northern

Europe. The incidence has been reported anywhere from 2% to 42%. The clinical presentation can be from palmar nodules/dimples, cord formation in the palm, to finger contractures with variable involvement of the skin.<sup>1–4</sup> Other manifestations include knuckle

pads and plantar nodules. Conditions such as intrinsic joint contractures, stenosing tenosynovitis, and soft tissue giant cell tumors may mimic the condition.<sup>1,2</sup>

Few studies dealing exclusively with female patients have been published.<sup>5-7</sup> It has been suggested that the disease presents later in women, and the results of surgery are generally worse in women including the incidence of the flare reaction, especially if additional procedures such as carpal tunnel release are performed.<sup>5,6</sup> Wallace studied the disease in women but did not have a comparison group.<sup>7</sup> Zemel studied the results of surgery in 66 women and concluded that results were worse in those who had concomitant carpal tunnel release.<sup>5,6</sup> The purpose of this study was to further examine the presentation, surgical technique, surgical outcome, including the complication rates, effects of additional procedures, and the rehabilitation regimen, of Dupuytren's disease in women and to compare these outcomes with a similar cohort of men and with previous studies of women with Dupuytren's disease.

## Materials and Methods

This was a retrospective descriptive study of the case series type. The catchment area for referral to our hospital includes the West Yorkshire area of England. All case notes from 1990 to 2004 with operated Dupuytren's disease were obtained for patients who were admitted under R.B. Patients were then filtered according to gender and the results analyzed.

One hundred nine women were identified with operated Dupuytren's disease from a total of 657 patients (708 hands). A total of 119 hands were operated. Thus, women formed 17% of all cases and were compared with 548 men.

The average age at presentation was 63 years (range 27–86 years) for women and 60 years (range 22–94 years) for men. The right hand was involved in 69 cases (58%). A total of 182 digits were involved in 105 hands (88%) in the women; which is 1.8 digits/patient. These were compared with 1,057 digits in the men. In 14 (12%) women there was palmar involvement alone with no digital involvement. Of the 105 hands with digital involvement, 25 had digital involvement alone, while 80 had involvement of the palm and digits. The little and ring fingers were involved most frequently.

## Measurement Parameters

All measurement parameters in the women were compared with men operated during the same period of time.

Number of Digits and Digital Joint Involvement Assessments were made of the number of digits involved with Dupuytren's disease, the number of MCPJs, PIP joints, and DIP joints involved, and comparison between the men and women.

## Measurement of Joint Contracture

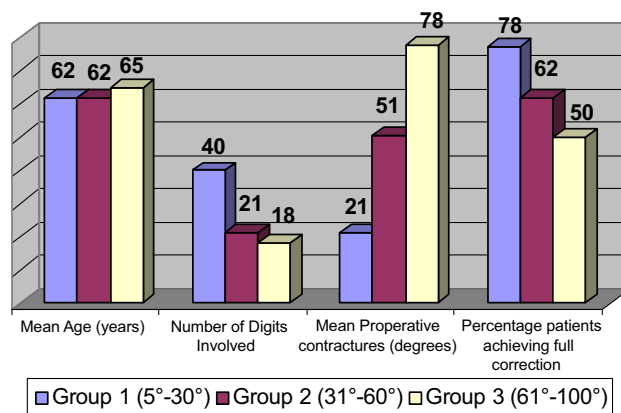
Both pre- and postoperative measurements were recorded by R.B. using a goniometer. All measurements recorded were for lack of extension at the metacarpophalangeal joint (MCPJ), proximal interphalangeal (PIP) joint, and distal interphalangeal (DIP) joint level. Full correction was achieved if there was no extension lag, postoperatively. We also ascertained the Tubiana staging of our patients with digital Dupuytren's contracture. This staging takes into account the mathematical sum of contractures of the MCPJ, the PIP joint and the DIP joint and then places them into four groups of increasing severity (stage 1: 0° to 45°, stage 2: 46° to 90°, stage 3: 91° to 135°, stage 4: 136° to 180°).

For purposes of evaluation of the PIP joint and the effects of increasing preoperative contracture on surgical results (Fig. 1), the digits were divided into three groups: Group 1, contracture between 5° and 30°; Group 2, contracture between 31° and 60°; Group 3, contracture between 61° and 100°.

## Type of Surgical Procedure and Rehabilitation

Indications for surgery included functional limitation in those patients with joint contracture and functional limitation/pain in those with purely palmar disease.

For fasciectomy, oblique digital incisions were used over the proximal phalanx extending to midlateral incisions over the middle phalanx on the most-involved side. Transverse distal skin crease incisions



**Figure 1.** The proximal interphalangeal joint in women with Dupuytren's disease.

were used in the palm, the exact length depending on the number of palmar bands. Skin grafts, if needed, were taken from the medial elbow crease. Laterodigital transposition flaps were used for moderate skin deficiency. Additional procedures performed during Dupuytren's release surgery were also taken into account.

No PIP joint structures were routinely divided for Dupuytren's contracture release. For formal joint release, however, the following plan was used to sequentially divide structures: check rein ligaments, accessory collateral ligaments, collateral ligaments (partial), flexor sheath, and volar plate.

Postoperatively, a bulky dressing was used along with Capener dynamic splintage (Medistox, Lancashire, UK) for 4 months in all patients with more than 20° contracture release. The splint was applied for 20 minutes per hour during the daytime, and no splintage was used at night. The frequency of using the Capener splint was reduced when the expected correction had been obtained.

### Complications

The standard definitions of recurrence (disease within previously operated sites) and extension (disease in a site not previously operated) were used.

The flare reaction was identified clinically by inflammation and worsening stiffness after 2 to 3 weeks of satisfactory postoperative recovery.<sup>5,6,8</sup> Complications were assessed postoperatively by R.B. in the clinic.

Complex regional pain syndrome (CRPS) was diagnosed by symptoms of pain secondary to surgery, characterized by a distal preponderance of abnormal symptoms out of proportion to the initial incident with variable progression over time.

Nerve and arterial injury was identified preoperatively and recovery noted during follow-up examination.

Complications including infection, hematoma, and graft/flap failure were assessed clinically on postoperative clinic visits.

### Statistical Analysis for Correlations and Regression Analysis

SPSS (Statistical Package for the Social Sciences, SPSS Inc., Chicago, IL) was used for statistical analysis. Normality of data was checked with the one-sample Kolmogorov-Smirnov Z test. Correlations between variables were tested (Pearson correlation) and linear regression analysis was performed to identify predictive value of variables for digital contracture, full correction, and recurrence. The women's and men's groups were tested with the *t* test for significant differences. Statistical significance was taken at the .05 level.

### Results

#### Number of Digits and Digital Joint Involvement

A total of 40 MCPJs, 79 PIP joints, and 4 DIP joints were assessed in the women. In the men, the corresponding numbers were 269 MCPJs, 456 PIP joints, and 35 DIP joints. The PIP joint was involved most frequently, occurring in 43% of digits in the women and 46% of digits in the men. Except for PIP joint correction, there was no significant difference in joint involvement between the two groups (Table 1).

#### Measurement of Joint Contracture

The metacarpophalangeal joint (MCPJ) was involved in 40 of the 182 digits in 34 women (29%). The mean preoperative contracture at the MCPJ was 35° (range 5°–70°). The mean postoperative residual contracture was 1° (range 0°–20°). The mean correction per MCPJ was 35°.

The proximal interphalangeal (PIP) joint was involved in 79 digits in 66 women (56%). The mean immediate preoperative contracture was 42° (range

**Table 1. Characteristics of Joint Involvement and Correction – Men Versus Women**

	Number (% Digits)		Preoperative Contracture in Degrees (Range)		Postoperative Contracture in Degrees (Range)		Correction in Degrees (Range)		Percentage Achieving Full Correction	
	M	W	M	W	M	W	M	W	M	W
MCPJ	269 (27%)	40 (22%)	39 (5–80)	35 (5–70)	0.6 (0–55)	0.5 (0–20)	38 (5–80)	35 (5–70)*	96%	97%
PIP Joint	456 (46%)	79 (43%)	45 (5–100)	42 (5–90)	5.9 (0–80)	6.8 (0–60)	39 (0–95)	35 (0–90)	86%	67%*
DIP Joint	35 (3%)	4 (2%)	29 (1070)	36 (3045)	3 (050)	0 (0)	26 (0–70)	36 (30–45)	60%	100%

M, men; W, women; MCPJ, metacarpophalangeal joint; PIP, proximal interphalangeal; DIP, distal interphalangeal.

\*Statistically significant ( $p < .05$ ).

5°–90°). The mean postoperative residual contracture was 7° (range 0°–60°). The mean correction was 35°. The evaluation of individual contractures in the previously described groups of increasing severity in the women is shown in [Figure 1](#). With increasing preoperative contractures, the percentage of patients with full correction decreased. There was a statistically significant difference in the percentage of women achieving full correction in groups 1, 2, and 3; however, there was no difference between the mean age of the three groups.

A total of 4 (3%) hands had involvement of the DIP joint among the women. The mean contracture was 36°. All had full correction immediately after surgery. In the men, involvement of the DIP joint was seen in 4 (2%) of the patients ([Table 1](#)).

Among the women, 119 (65%) involved digits that fell into the Tubiana stage 1 category, 46 (25%) in stage 2, 14 (8%) in stage 3, and 3 (2%) in stage 4. Among the men, 799 (75%) digits fell into Tubiana stage 1, 197 (19%) in stage 2, 51 (5%) in stage 3, and 10 (1%) in stage 4. There were no statistical differences in these proportions between groups.

The characteristics of joint involvement in comparison with our men are shown in [Table 1](#). The clinical picture is very similar between the women and the men as far as preoperative joint contractures are concerned. Significant differences were seen, however, in full PIP joint correction ( $p < .05$ ).

#### Type of Surgical Procedure and Rehabilitation

The type of operation performed on these patients depended on whether the digits were involved or not. Of the 105 women with digital involvement, 113 procedures were performed. Fasciectomy alone was performed in 96 instances in 93 (78%) women. Fasciectomy and local flap was performed 9 times (6% of women). Dermafasciectomy with full thickness skin graft was performed in 8 instances (4% of women). Fourteen patients (12%) with only palmar Dupuytren's disease had fasciectomies. The corresponding figures for the cohort of men were: fasciectomy, 438 patients (80%); fasciectomy and local flap, 71 patients (13%); and dermafasciectomy and skin graft in 39 patients (7%).

A release of the PIP joint was performed in 10 women (8%) in comparison to 41 men (8%). The mean age in this group of women was 59 years compared with 58 years in the men. The mean preoperative PIP joint contracture was 50° (range 25°–62°). The mean residual contracture was 10° (range 10°–25°). The mean correction thus was 40° in the

women. In the men, the mean correction per PIP joint following joint release was 56°. The differences were not statistically significant.

Twenty women (17%), in comparison with 11% men, had other procedures performed in addition to surgery for Dupuytren's disease. The most common additional procedures were carpal tunnel release (6% of women, 4% of men) and trigger finger release (5% of women, 3% of men). There was no statistical correlation between the flare reaction and carpal tunnel release, as reported previously.<sup>5,6</sup>

#### Complications

The overall complication rate was 15% and was comparable with the men. Infection occurred in 2 (2%) women compared to 16 (3%) men. 3 patients (3%) each had digital nerve or digital artery injury compared to 11 (2%) male patients. The mean follow-up evaluation was 12 months, with a range of 0.5 to 24 months. Recurrence was seen in 26 female patients (22%), usually within 18 months. Disease extension rate was 6% (7 patients). Recurrence in the men was 19% (104 patients), and disease extension was 5% (27 patients).

Flare reaction occurred in 2 women (2%) compared with 12 men (2%). Only one patient had postoperative CRPS (<1%). In the men, CRPS was seen in 11 cases (2%).

#### Statistical Analysis for Correlations and Regression Analysis

Regression analysis yielded no useful variables for predicting recurrence and degree of contracture. For predicting an immediate full correction of contractures, there was a significant inverse relationship with age of patients, preoperative PIP joint contracture, and preoperative Tubiana stage.

Other significant correlations included a linear relationship between age and Tubiana staging, thus older patients had more severe disease ( $p < .05$ ). More severe MCPJ contractures were seen in patients with more than one digit involved ( $p < .05$ ).

In comparing the men and women ([Table 1](#)), the only statistically significant differences were in MCPJ correction in degrees (less in women), the use of postoperative splintage (more in women), full correction achieved in the PIP joint (less in women), and mean correction of the PIP joint following a joint release. The differences in age of the two groups fell just short of statistical significance ( $p = .057$ ). No statistical correlation was seen between the postoperative correction/full correction and the performance of additional procedures at the time of Dupuytren's con-

tracture surgery. Similarly the performance of additional procedures, especially carpal tunnel release, was seen to have no bearing on complications or the flare reaction.

## Discussion

There is very little in the medical literature dealing exclusively with Dupuytren's disease in women. Zemel et al<sup>5,6</sup> discussed the long-term results after operative correction of Dupuytren's disease. They describe the results in 66 women (83 hands) followed for an average of 3 years and in whom 71% of operated hands had limited fasciectomy and 29% patients had extended fasciectomy. Dermafasciectomy was performed in 23% patients, as part of either limited or extended fasciectomy. A bulky dressing with a dorsal plaster splint was used for 1 week postoperatively in all patients. In Zemel's series, 33% had previous surgery, and the recurrence rate was 17%. As far as improvement in finger extension is concerned, the MCPJ had the best results, followed by the DIP joint, with the PIP joint being worst for improvement (34%–66% improvement in extension). They concluded that preoperative PIP joint contracture was the most accurate predictor for postoperative PIP joint contracture and that a flare reaction was more common in those with concomitant carpal tunnel release and more extensive fasciectomy.

Wallace,<sup>7</sup> in 1965, reported his results in 46 women and concluded that the age group 39–59 years had the worst results, along with patients who had palmar and digital fasciectomy. They also performed amputations as part of treatment; the least complications were seen in patients who had amputations. Wallace also stated that results are poorer in women and that a "frozen hand" sometimes occurred. This, we assume, is the same as the flare reaction.

The incidence of the flare reaction has been reported variably between 5% to 20%<sup>5–8</sup> and is clinically identified by inflammation and worsening stiffness after 2 to 3 weeks of satisfactory postoperative recovery. The digits become worse than the preoperative state. The present incidence of the flare reaction at 2% compares well with the reported incidence. The incidence of the flare reaction in the men in our study was 2%.

Previously reported incidence of CRPS is 4%.<sup>8</sup> In this series, the incidence was less than 1% (2% in men).

The present series has a larger group of women for evaluation compared with the above studies; how-

ever, some of our findings mirror the findings from these previous studies. Women with Dupuytren's contracture requiring surgery are generally older, and although the contractures in degrees are comparable with men, the results of PIP joint surgery are worse. They are, however, comparable with previous studies. We did not find the "worse age group for results" as seen by Wallace, but found on the whole, as age increased, contractures got worse and results poorer. Our results corroborated Zemel's contention that preoperative PIP joint contracture was a good predictor of postoperative result along with age and Tubiana stage. We did not find worse results for patients who had more extensive disease. The incidence of the flare reaction was also far lower than previously reported.

The forum is open for discussion regarding why, as reported in previous studies,<sup>5–8</sup> women present later and with more severe joint involvement. Do women cope better, for longer with their disease; is the nature of manual activity in women more compatible with the disease pattern; is the disease different in women? This was a clinical study, and we can thus comment only on the clinical picture of the disease in women. Statistically speaking, although far less common in women, the clinical picture of Dupuytren's disease and its treatment in this study is very similar to that in men, with women doing worse for joint correction, and because they do worse in contracture correction, there is a higher usage of postoperative dynamic splintage.

The limitations of this study include the fact that it is a retrospective, descriptive review with no control group although we have compared the results with men. In spite of the substantial numbers, these are all patients who had been preselected for surgery and thus represent the results of surgical intervention rather than an epidemiological evaluation of all patients with the disease.

The present operative regimen in combination with the postoperative rehabilitation program gives favorable results compared with previous studies.

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