

DUPUYTREN'S CONTRACTURE: AN AUDIT OF THE OUTCOMES OF SURGERY

J. J. DIAS and J. BRAYBROOKE

From the Institution: British Society for Surgery of the Hand, Lincoln's Inn Field, London, UK

This multi-centre postal questionnaire study was conducted by the Audit Committee of the BSSH to assess the outcomes of surgery for Dupuytren's Contracture using subjective data provided by 1177 patients at a mean follow-up of 27 (SD 8) months after surgery. Surgery for Dupuytren's contracture achieved a high rate of full, or almost full, correction in 826 patients (75%) but had a high incidence of post-operative patient-reported complications of 46%. A higher complication rate was seen in those patients with worse initial deformities. The rate of contracture recurrence or persistence was 158 of 1037 (15%). The severity of contracture correlated with the final hand function measured using the PEM score. Recurrence was more common in patients with greater initial deformity. Recurrence was less common if good correction was achieved at surgery. The relevance and limitations of this data are discussed.

Journal of Hand Surgery (British and European Volume, 2006) 31B: 5: 514–521

Keywords: Dupuytren, surgery, outcome, complications, recurrence

Overall, 22% recurrence/persistence at 27 mo
= 10%/Y recurrence, loosely defined

Outcome following surgery for Dupuytren's disease in terms of surgical correction, complications, recurrence and function is poorly documented. The literature consists predominantly of papers by individual surgeons reporting their experiences after operating on variable numbers of patients with Dupuytren's disease. The largest peer-reviewed publication is by Hueston (1963) who reported on 224 patients. McFarlane et al. (1990) presented data on 1150 cases from 20 countries looking mainly at the differences between countries. This material was not peer-reviewed. Results were ascertained at between 6 months and 1 year and some were followed for longer. These results were assessed by the contributing surgeons.

The British Society for Surgery of the Hand (BSSH) Audit Committee conducted a multi-centre study in the UK to quantify the outcome of surgery and how this is influenced by the joints affected and the severity of the deformity at initial presentation.

PATIENTS AND METHODS

The British Society for Surgery of the Hand (BSSH) invited surgeons in hand units throughout the UK to identify patients who had had surgery for Dupuytren's contracture within the index year. One hundred and thirty one surgeons in 36 units contributed to this study.

Consent for inclusion in this study was sought from all 1881 patients by telephone, by post or directly by the participating surgeons. This multi-centre study was given ethical approval by the Midlands Regional Ethics Committee (MREC). A questionnaire (Fig 1) was devised by senior hand surgeons in the Audit Committee of the BSSH to assess the outcomes of surgery. Such a questionnaire has good face validity and avoids any

surgeon bias or inter-observer error when numerous observers measure the finger deformities using different techniques at multiple centres, as done in a previous report on surgical outcome (McFarlane et al., 1990). The questionnaire was validated on a group of patients from the Trent region, where deformity measurements were compared with their questionnaire responses. A good correlation was shown between the two and this correlation has subsequently been reproduced independently (Khatri et al., 2004).

These questionnaires were sent to the 1881 patients submitted by the contributing units, either directly to the patients or in pre-prepared packs, distributed by the participating surgeons. All questionnaires were returned to the study team. Of 1881 questionnaires submitted to the patients, 475 did not give consent or did not respond to repeated requests for information. Fourteen hundred and six questionnaires were returned and 1177 were analysed. Relatives informed us that 33 patients had died, 28 had moved and 168 withdrew their consent to be contacted and/or did not provide any information about their condition so were not analysed. If no response was entered in any section of the questionnaire this questionnaire was also excluded from analysis as a missing value.

There were 969 men and 208 women. The mean age was 63 (SD 11) years and the mean follow-up 27 (SD 8) months. To estimate the proportion of our sample as a percentage of the annual number of operations performed for Dupuytren's contractures in the UK, we referred to the Derby Hand Audit (Burke et al., 1991). This study estimated an incidence of Dupuytren's contracture of 32.5/100,000/year based on referrals of which 20.5/100,000/year undergo surgery. Extrapolating this to the UK as a whole, suggests that approximately 12,000 patients would have had surgery for Dupuytren's

contracture in the index year. Our sample, therefore, represented 16% of all the operations performed in the UK for Dupuytren's contracture in the index year.

The questionnaire investigated the patterns of disease in terms of the digit(s) and joint(s) affected and collected demographic patient information as shown in Fig 1. Initial and final deformity were represented on a diagram. This consisted of nine images with progressive deformities of the metacarpophalangeal joint, proximal interphalangeal joint or both. Patients marked the figure that most closely matched their Dupuytren's contracture deformity before surgery. For the thumb, the interphalangeal joint deformity was counted as the proximal interphalangeal joint. If more than one digit was affected, the patient was asked to submit deformity information on the worst affected digit only, which we assumed would have the most impact on hand function. These images were re-classified into five deformity groups based on the effect the deformity would have on hand function and on the complexity of the surgery required, as shown in Table 1.

The outcome of surgery was assessed by asking the patients about surgical correction obtained immediately after surgery, using the statement 'The bent finger was corrected fully/ almost fully/ partly/ not at all' and this was compared to their final deformity to assess recurrence of the disease. The number of operations was established in Q2 to identify those patients having revision surgery. The type of surgery (partial fasciectomy/ open palm/ dermofasciectomy with skin graft) was deduced by asking the patient in Q4, was the wound left open and allowed to heal and was skin taken from (e.g.) arm, leg or tummy and applied to the finger?

The final deformity was assessed using the same diagram as used to assess the initial deformity with the nine images being reclassified into five groups, as previously stated (Q9). A further question (Q10) was used to qualify this answer, using a seven-interval visual analogue scale response to 'My finger is now Better, Unchanged or Worse'. A score of less than 4 was considered to be better than before surgery.

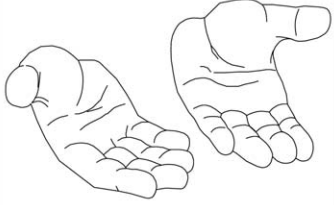
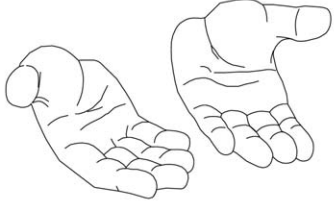
Dupuytren's Study :

Your Name _____ Date

1. What was the **date** of your hand operation ?

2. Was this **First** **Second** or **Third** operation on this finger (s)?

3.

<p>a. Before surgery which finger (s) was bent ? Please tick.</p> 	<p>b. Which finger (s) were operated on ? Please tick.</p> 
------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------

4. In the first two weeks after your operation

a. Was the wound left open and allowed to heal slowly?	Yes	No
b. Was skin taken from (eg) arm, leg or tummy and applied to the finger ?	Yes	No
c. Was the finger tip numb for longer than 2 days?	Yes	No
d. Was the wound infected and needed dressings and/or antibiotics ?	Yes	No
e. Did the finger tip turn blue/black and cold?	Yes	No

f. Was the bent finger corrected	Fully	Almost fully	Partly	Not at all ?
------------------------------------------------	-------	--------------	--------	--------------

Fig 1 The questionnaire used to collect data from patients.

- 5. After your operation have you been told that you will require another operation?

Yes	No
-----	----
- 6. Have you had another operation?

Yes	No
-----	----
- 7. Has your finger been amputated?

Yes	No
-----	----

8. My bent finger is now:
(If more than one finger was operated answer for the worst bent finger.)

- 1
straight
- 2
- 3
- 4
- 5
unchanged
- 6
- 7
worse than before

9. How bent was your finger?

Please tick the figure which best matches the shape of your finger.

If more than one finger was operated answer for the worst bent finger.

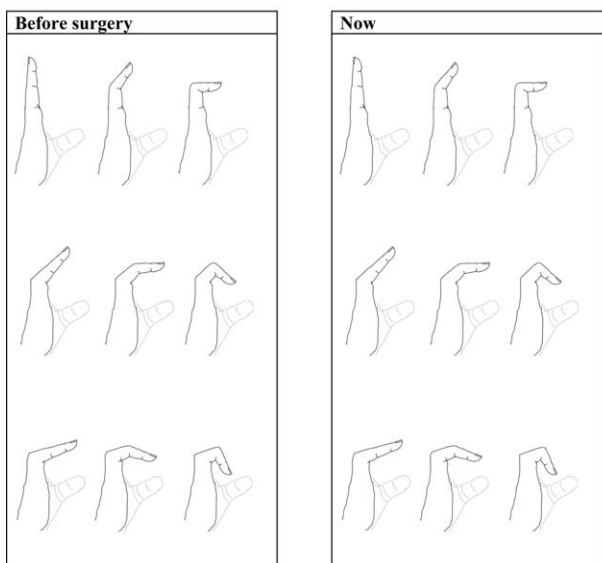


Table 1—Categorisation of finger deformities

The re-classification of the finger deformities from the questionnaire images

1. No contracture.
2. Mild metacarpophalangeal joint contracture only.
3. Mild proximal interphalangeal joint contracture or moderate metacarpophalangeal joint contracture.
4. Moderate proximal interphalangeal joint contracture.
5. Severe contracture of both metacarpophalangeal joint and proximal interphalangeal joint.

To identify early complications, specifically numbness, infection and circulatory disturbance, the patients were asked a series of questions. Numbness was identified by asking ‘Was the fingertip numb for longer than 2 days?’ (Q4c). The question ‘Was the wound

infected and needed dressings and/or antibiotics?’ (Q4d) suggested infection. Circulatory disturbance was established by the response to the question ‘Did the fingertip turn blue/black and cold?’ (Q4e).

Recurrence was defined as the reappearance of a contracture sufficient to require surgery, according to Hueston’s table-top test (Hueston, 1982). This correlates with any deformity greater than a mild metacarpophalangeal joint contracture in the images of our questionnaire. To estimate the true recurrent contracture rate, the 359 patients who had a full correction of their deformity were studied. In this group, any recurrence of the deformity was likely to be caused solely by recurrent Dupuytren’s disease.

Hand function and disability were assessed using the Patient Evaluation Measure (Dias et al., 2001). This is a validated patient-completed questionnaire investigating symptoms, disability and satisfaction. Each question has a 7 interval visual analogue scale of answers. The score is expressed as a percentage, with 0% representing a normal hand and 100% a useless hand.

The data was analysed statistically using Pearson Chi-Square test and Spearman Correlation.

RESULTS

Table 2 shows the pattern and severity of the disease. The 1177 patients reported disease affecting 1871 fingers. The most commonly affected digit was the little finger (914 fingers – 49% of the total) followed by the ring finger (596 fingers – 32% of the total). Two hundred and ninety one (32%) of all affected little fingers had severe contractures of both the metacarpophalangeal and the proximal interphalangeal joint. In 13 (0.7%) of the group, no contracture was present but a nodule was removed.

The disease was bilateral in 197 of 1174 cases (16.8%, data was missing in three cases) and, in 701 (59.7%) patients, a single digit alone was involved. The right and left hand were equally affected.

Table 3 relates the initial deformity to the correction obtained after surgery and the final deformity at the time of review. This table shows, for example, that of 229 patients with a mild metacarpophalangeal joint contracture, 132 (58%) had a full correction of the contracture and, of those, 116 (88%) maintained the full correction at follow-up. By way of contrast, of 264 patients with severe contractures of both the metacarpophalangeal and the proximal interphalangeal joint, 73 (28%) obtained a full correction, of which 55 (75%) maintained this correction at review. This table shows that the greater the initial deformity the less likely a full surgical correction will be achieved. However, when full correction is achieved it is likely to be maintained, regardless of the severity of the initial deformity ($p < 0.0001$).

Table 2—Patterns of disease – initial deformity and digit affected

Digit	Initial deformity					Total (n = 1871)
	None	Mild MCPJ	Mod MCPJ/ Mild PIPJ*	Mod PIPJ*	Sev Both*	
Thumb	1	9	17	9	17	53
Index	0	23	31	18	20	92
Middle	1	53	67	40	55	216
Ring	7	139	169	111	170	596
Little	4	152	256	211	291	914

*For the thumb, the IPJ deformity was counted as the PIPJ.

Table 3—Relationship of initial deformity, the surgical correction and final deformity

Initial deformity	Correction	Final deformity (n (%))					Total (n = 1037)	P-value*
		None	Mild MCPJ	Mild PIPJ/Mod MCPJ	Mod PIPJ	Sev Both		
Mild MCPJ	Fully	7 (100)					7	0.111
	Almost full	2 (100)					2	
	Partly		1 (100)				1	
	None						0	
	Total	9	1				10	
Mild PIPJ/Mod MCPJ	Fully	116 (88)	15 (11)			1 (1)	132	0.0001
	Almost full	34 (51)	28 (42)		4 (6)	1 (1)	67	
	Partly	1 (6)	13 (72)		3 (16)	1 (6)	18	
	None		6 (50)		3 (25)	2 (17)	12	
	Total	151	62		10	3	229	
Mod PIPJ	Fully	113 (84)	13 (9)	8 (6)	1 (1)		135	0.0001
	Almost full	13 (11)	84 (73)	15 (13)	1 (1)	2 (2)	115	
	Partly	1 (2)	28 (52)	18 (33)	4 (7)	3 (1)	54	
	None			8 (50)	6 (38)	2 (12)	16	
	Total	127	125	49	12	7	320	
Sev Both	Fully	68 (86)	2 (1)	2 (2)	7 (10)		79	0.0001
	Almost full	9 (11)	50 (64)	10 (13)	9 (11)	1 (1)	79	
	Partly		12 (29)	14 (34)	9 (22)	6 (15)	41	
	None	2 (13)	1 (7)	3 (20)	6 (40)	3 (20)	15	
	Total	79	65	29	31	10	214	
Total	Fully	55 (75)	8 (11)	4 (5)	1 (1)	5 (8)	73	0.0001
	Almost full	13 (15)	63 (72)	2 (2)	4 (5)	5 (6)	87	
	Partly	2 (2)	24 (27)	36 (40)	11 (12)	17 (19)	90	
	None			3 (21)	2 (14)	9 (75)	14	
	Total	70	95	45	18	36	264	

*P-value for Spearman Correlation

Key:	Deformity	Total	%
	Improved	804	78
	Unchanged	187	18
	Worse	46	4

Overall, 22% recurrence at 27 mo = 10%/Y recurrence, loosely defined

In Q9 the patients marked on the diagram the deformity of their finger at review and this was correlated with their initial deformity, as shown in

Table 3. In 784 of 1037 (76%) the deformity did not recur to the level of the initial deformity or to a level that required further surgery, ie. greater than a mild

metacarpophalangeal joint contracture. Nine hundred and fifteen of 1130 patients (81%) scored less than 4 in answering Q10.

Five hundred and forty-five of 1174 patients (46%) reported early complications. The complication rate rose significantly with increasing severity of the initial deformity. Numbness occurred in 411 of 1149 patients (36%). However, in the subgroup of patients with severe contractures of both the metacarpophalangeal and proximal interphalangeal joints, numbness was experienced by 133 of 253 patients (46%). Two hundred and twenty eight of 1149 patients (20%) reported infections and 143 (12%) reported blue/black discoloration and coldness of their finger, as shown in Table 4. We interpreted this as suggesting vascular compromise. This data was missing in 25 cases.

The overall recurrent, or persistent, contracture rate was 158 of 1037 (15%), but this increased from 16/229 (7%) with an initial deformity of a mild metacarpophalangeal joint contracture to 99/264 (37.5%) with severe contractures of both the metacarpophalangeal and the proximal interphalangeal joints. In 40 cases, one of the three data items used to construct this table was missing. One hundred and nine (10%) patients (of 1130 with complete data) said that their deformity was not improved after surgery and 106 (9%) considered that their deformity was worse after surgery (Table 4).

The hand function and disability, as assessed by the PEM score, correlated well with final deformity as shown in Table 4. Those with no deformity at review had a better PEM symptom and disability score of 9 (SD 14), compared to a score of 57 (SD 25) in patients with severe contractures of both joints ($P < 0.0001$).

DISCUSSION

This audit was conducted to investigate the outcomes of surgery for Dupuytren's contracture. The goal was to establish a national perspective on the results of the surgical management of this disease. A multi-centre study was used to recruit a large number of patients. This study assessed the initial deformity, surgical correction, recurrent contracture rates, complications, hand function and disability at a minimum of two years follow-up. Recurrence is reported to be apparent by this stage if it is likely to occur (Hueston, 1963).

Patterns of disease

The pattern of the disease was different to that previously reported. The most commonly affected digit was the little finger (49%), followed by the ring finger (32%). Thirty-two per cent of the little finger deformities were severe contractures of both joints. Makela et al. (1991) and Sennwald (1990) both found the most commonly affected digit was the ring finger, with a prevalence of 43% and 39%, respectively (Makela et al., 1991; Sennwald, 1990). The prevalence of radial Dupuytren's disease was similar to that in previous reports (3% as compared to 4% and 6% in the above two studies, respectively). The high prevalence of severe deformities may reflect late presentation to surgeons in this country and/or the fact that surgeons in this country only operate on disease when it is advanced and/or the disease is aggressive in this country. McFarlane et al. (1990) were unable to demonstrate significant differences between European countries in the severity of disease reported.

Table 4—Relationship of initial deformity and patient reported change, complications and PEM score

Patient reported outcome	Initial deformity (n (%))						Total (n = 1130)	(P-value)**
	None	Mild MCPJ	Mod MCPJ/ Mild PIPJ	Mod PIPJ	Sev Both			
Better	11 (92.0)	223 (86.4)	282 (82.0)	181 (78.0)	218 (76.8)	915 (81.0)	0.16	
Unchanged	1 (8.0)	16 (6.2)	33 (9.6)	27 (11.6)	32 (11.2)	109 (9.6)		
Worse	0 (0.0)	19 (7.4)	29 (8.4)	24 (10.4)	34 (12.0)	106 (9.4)		
<i>Total (n = 1149)</i>								
<i>Patient reported complications</i>								
Numbness	3 (25.0)	73 (28.2)	124 (35.2)	78 (33.2)	133 (45.7)	411 (35.8)	0.0001	
Infection	3 (25.0)	53 (20.5)	57 (16.2)	43 (18.3)	72 (24.7)	228 (19.8)	0.093	
Circulation	3 (25.0)	33 (12.7)	33 (9.4)	26 (11.1)	48 (16.5)	143 (12.4)	0.048	
<i>Final deformity (n (SD))</i>								
Patient reported outcome	None	Mild MCPJ	Mod MCPJ/Mild PIPJ	Mod PIPJ	Sev Both	Total (n**= 1047)		
Mean PEM score	9 (14)	20 (19)	37 (24)	47 (28)	57 (25)	0.0001		

** n is less as incomplete PEM questionnaires invalidate the score.

***Chi-squared test.

Surgical correction

Patients judged the degree of correction achieved by surgery. Eight hundred and twenty six (71%) of the patients in this study chose either 'Full or Almost Full' to estimate the correction achieved. Correction, however, depended on the severity of the initial deformity. The rate of good correction decreased to 160 of 264 (61%) in patients who had severe contractures of both the metacarpophalangeal and the proximal interphalangeal joints. The correction was well maintained at 2 years, with 804 of 1037 (75%) of patients having no recurrence or only a mild metacarpophalangeal joint contracture. Makela et al. (1991) reported that 86% of their 100 cases had a good immediate and long-term outcome at a mean of 3.2 years and Honner et al. (1971) reported 66% of their 108 patients having a good or excellent outcome at a mean of 4 years. Both defined a good outcome as a slight limitation of flexion or extension, with recurrence being occasionally present but too slight to interfere with normal activity.

Outcome

Outcome measures used to assess the success of surgery for Dupuytren's contracture are surgeon orientated, concentrating on recurrence and complications, rather than patient orientated, looking at function and disability. The patient presents with disability caused by a bent finger. Their aspiration is to get a straight and supple finger which does not get in the way. It is possible that the recurrence of disease with the appearance of nodules and cords would cause them few symptoms provided they were not associated with a significant contracture.

Complications

The second part of the study addressed the early complications of surgery. A variety of complications have been reported in the literature, including excessive inflammation, haematoma, ischaemic skin necrosis, infection, granuloma formation, transient paraesthesiae, scar contracture, persistent proximal interphalangeal flexion contracture, distal interphalangeal hyperextension deformity, joint stiffness, poor flexion and grip strength, pain, circulatory disturbance and CRPS Type 1 (Reflex Sympathetic Dystrophy, Algodystrophy) (Gelberman et al., 1982; Prosser and Conolly, 1996). In this study, the complication rate was 46%. This was higher than those reported in the literature which ranged from 6% to 40% (Honner et al., 1971; Makela et al., 1991; McFarlane and Jamieson, 1966; Sennwald, 1990). The commonest complications in this study were numbness for more than 2 days, which affected 36% of patients, followed by wound infection (19%) and circulatory disturbance (12%). There is a clear relation-

ship between the incidence of each reported complication and the severity of the initial deformity, with a greater initial deformity having a higher complication rate. This could be explained by the increasing complexity of the surgery required by the greater initial deformity of the finger. Unfortunately, we were not permitted to establish the incidence of amputation in this population by the ethics committee. McFarlane et al. (1990) reported a 1% amputation rate of all the little fingers which underwent surgery for recurrent disease. These complication rates may have been overestimated by over-reporting, by patients misinterpreting the questionnaire. For example, antibiotics may have been confused with non-steroidal anti-inflammatory drugs, or bruising from a haematoma with the blue/black discoloration of circulatory disturbance. In addition, our threshold for reporting complications may have been too low, e.g. assessing neurological status at 2 days may identify a neurapraxia which may resolve.

Recurrence

Previous authors have reported a rate of recurrence between 2% and 47%, albeit using various definitions of recurrence, as shown in Table 5. Prognostic factors for recurrence have previously emphasized clinical features identified with more aggressive disease, such as young age of onset, strong family history, distant disease (Peyronie's and plantar disease) and bilaterality. In the literature, recurrence has been defined in three main ways 'presence of active disease in the form of either nodules or cords' (Hall et al., 1997), 'recurrent nodules and contractures occurring in the area of the operation' (Honner et al., 1971) and 'recurrent joint contracture sufficient to require further surgery, rather than the appearance of nodules in the treated area' (McFarlane and Jamieson, 1966). Tonkin et al. (1984) distinguished the re-appearance of nodules and/or cords on the operated finger, with or without contracture, from extension of the disease which is 'the appearance of lesions outside the operated area where previously no disease had been detected'. The various definitions used have been summarised in Fig 2. However, not all bent fingers following surgery are recurrences of the disease causing contracture of the finger joint. The deformity may persist if there is an extensor lag, joint stiffness or arthritis, or a complication, such as infection, swelling or CRPS Type 1 (Reflex Sympathetic Dystrophy, Algodystrophy), which results in excessive scarring of the palmar soft tissues. The cause of persistent, or recurrent, contracture of the finger makes no difference to the patient, as all will compromise function, resulting in a poor result. In our study, recurrence was defined as any deformity which was more than a mild metacarpophalangeal joint contracture. This correlates with a positive Hueston (1982) table-top test, which is a well

Table 5—Rates of recurrence with the definition used in each published study

Author	Year	Cases	Follow-up (Months)	Definition of recurrence	Recurrence rate (%)	Complication (%)
Hueston	1963	224	*	'Appearance of new Dupuytren's tissue within the area cleared at operation'	28	*
McFarlane and Jamieson	1966	100	12	'Recurrent joint contracture sufficient to require further operation'	2	6
Honner et al.	1971	108	48	'Nodules and contractures occurring in the area of the operation'	19	32
Sennwald	1990	103	3–6	'Recurrence is the reappearance of the disease in the same location as was previously operated'	*	40
Tonkin et al.	1984	100	38	'Appearance of new lesions in an already operated area'	46.5	*
Makela et al.	1991	160	38	No definition	27	13.4
Hall et al.	1997	67	48	'Presence of active disease in the form of either nodules or cords'	8	*
Armstrong et al.	2000	103	70	'The reappearance of cords or nodules'	11.6	*

*Not stated.

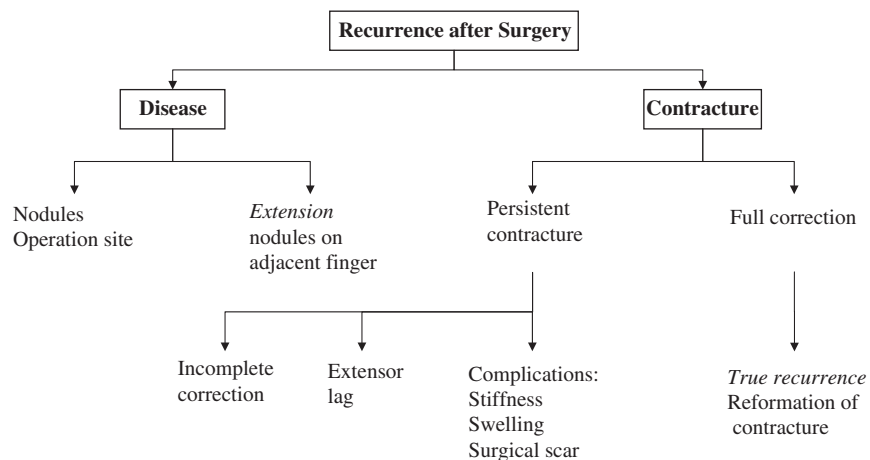


Fig 2 A flow diagram of the various derivations of recurrence after Dupuytren's contracture surgery.

recognised sign to indicate that surgical intervention should now be considered. Using this definition, the recurrence rate was 158 of 1037 (15%) patients. This may be an overestimation of the true recurrence rate because persistence of a bent finger due to other causes could not be excluded.

This study confirms the observation (McFarlane et al., 1990) that surgery for contracture of the metacarpophalangeal joint yields better results. Recurrence has not previously been related to the degree of initial deformity or the degree of surgical correction achieved. Our study identifies that recurrent contracture is more likely the greater the initial deformity, even after good surgical correction. In addition, there is an inverse relationship between the degree of surgical correction and recurrent contracture. In the group with an initial mild metacarpophalangeal joint contracture, the recur-

rence rate was 1 of 132 (1%) after a full surgical correction and 6 of 12 (50%) after an incomplete surgical correction. In the group with an initial deformity of severe contractures of both joints, the recurrence rate was 10 of 73 (14%) after a full surgical correction and 14 of 14 (100%) after a poor surgical correction. When full correction is achieved the recurrence rate ranged from 0.8% with mild metacarpophalangeal joint contractures to 14% with severe contractures of both the metacarpophalangeal and the proximal interphalangeal joints. However, when a poor correction (none) was achieved, the recurrence rate ranged from 50% to 100%, respectively. This might suggest that either there must be residual disease after incomplete surgical correction, which leads to earlier recurrence of the disease, or that the disease is more aggressive (Gudmundsson et al., 2001).

Disability

The hand function and disability scores confirmed our initial assumption that the more severe the final deformity the greater the encroachment on the palmar space. Hand function and disability was worse in the patients with greater final deformities.

This study, like most studies of this size, has several shortcomings which need to be considered when evaluating the information and conclusions drawn. Although the sample population was large in this study, it still reflected only a small proportion of the total number of patients undergoing surgery for Dupuytren's disease nationally and may not be representative of the whole group of the patients operated on in the UK. McFarlane et al. (1990) reported outcome of 1150 cases collected by surgeons worldwide. The data in this 1990 study was reported by surgeons, only 50 of the cases were from the UK and a large number had missing data on measurements and outcome. The observations made, however, have still been very worthwhile and have influenced the counselling of patients in whom surgery is considered. Secondly, our current study focused on the digit with the most severe deformity and, therefore, the conclusions in terms of effect on hand function may be an oversimplification of the true situation. It was assumed that the most deformed digit would be the principal cause of hand disability for this disease. However, it is possible that patients with disease affecting more than one finger, and, in particular, in both hands, may report a worse hand function, even if the worst finger only had mild disease. This could be a result of extension of their disease rather than from the digit initially affected, treated and recorded in the study. Finally, using a questionnaire to assess a previous state may introduce recall bias, as patients have to remember the deformity of their finger and complications after a period of time.

Dupuytren's contracture is a common condition in North-West Europe (McFarlane et al., 1990). Our study shows good correction can be achieved by surgery but that treatment has a high complication rate and a significant rate of recurrent contracture, especially with more severe initial deformities. Those with good initial correction are less likely to recur. The level of residual deformity will ultimately dictate hand function. In the future, studies on the outcomes of surgery for Dupuytren's contracture should report on the recurrence of contracture rather than the recurrence of disease. This would better reflect the hand function and disability, which are, ultimately, how the patient judges the outcome of surgery.

Acknowledgements

The authors acknowledge the advice of the members of the Audit Committee of the British Society for Surgery of the Hand and their help in constructing the questions to be asked and help and support

throughout the study. The members of this committee gave the questionnaire face validity. The members included Mr Grey Giddins, Mr Ian Trail, Mr David Elliot and Mr Andrew Macey. Mr Heras-Palou helped obtain the MREC authorisation and co-ordinated the collection and entry of data.

References

- Burke FD, Dias JJ, Lunn PG (1991). Providing care for hand disorders: trauma and elective. *Journal of Hand Surgery*, 16B: 13–18.
- Dias JJ, Bhowal B, Wildin CJ, Thompson JR (2001). Assessing outcome of hand disorders. Is the Patient Evaluation Measure (P.E.M) reliable, valid, responsive and without bias? *Journal of Bone and Joint Surgery*, 83B: 235–240.
- Gelberman RH, Panagis JS, Hergenroeder PT, Zakaib GS (1982). Wound complications in the surgical management of Dupuytren's contracture: a comparison of operative incisions. *Hand*, 14: 248–254.
- Gudmundsson KG, Arnrimsson R, Jonsson T (2001). Eighteen years follow-up study of the clinical manifestations and progression of Dupuytren's disease. *Scandinavian Journal of Rheumatology*, 30: 31–34.
- Hall PN, Fitzgerald A, Sterne GD, Logan AM (1997). Skin replacement in Dupuytren's Disease. *Journal of Hand Surgery*, 22B: 193–197.
- Honner R, Lamb DW, James JI (1971). Dupuytren's contracture. Long term results after fasciectomy. *Journal of Bone and Joint Surgery*, 53B: 240–246.
- Hueston JT (1963). Recurrent Dupuytren's contracture. *Plastic and Reconstructive Surgery*, 31: 66–69.
- Hueston JT (1982). The table top test. *The Hand*, 14: 100–103.
- Khatri, M., Al Maiyah, M., Broome, G.H.H. Validation of British Society for Surgery of the Hand (BSSH) patient administered questionnaire for assessment of outcome of surgery for Dupuytren's Disease of the hand. In: Ninth Congress of the IFSSH, Budapest, (2004).
- Makela EA, Jaroma H, Harju A, Anttila S, Vainio J (1991). Dupuytren's Contracture: the long-term results after day surgery. *Journal of Hand Surgery*, 16B: 272–274.
- McFarlane RM, Botz JS, Cheung H. Epidemiology of surgical patients. In: McFarlane RM, McGrouther DA, Flint MH (Eds) *Dupuytren's disease. Biology and treatment*, Churchill Livingstone, Edinburgh, 1990: 201–215.
- McFarlane RM, Jamieson WG (1966). Dupuytren's contracture. The management of one hundred patients. *Journal of Bone and Joint Surgery*, 48A: 1095–1105.
- Prosser R, Conolly WB (1996). Complications following surgical treatment for Dupuytren's contracture. *Journal of Hand Therapy*, 9: 344–348.
- Sennwald GR (1990). Fasciectomy for treatment of Dupuytren's disease and early complications. *Journal of Hand Surgery*, 15A: 755–761.
- Tonkin MA, Burke FD, Varian JP (1984). Dupuytren's contracture: a comparative study of fasciectomy and dermofasciectomy in one hundred patients. *Journal of Hand Surgery*, 9B: 156–162.

Received: 21 December 2004

Accepted after revision: 4 May 2006

Mr J. Dias MD, Department of Orthopaedic Surgery, University Hospitals of Leicester, The Glenfield Hospital, Groby Road, Leicester, LE3 9QP, UK. Tel.: +1162563089; fax: +1162502676.

E-mail: joseph.dias@uhl-tr.nhs.uk