

## A natural history of Dupuytren's contracture treated by surgical fasciectomy : the influence of diathesis (76 hands reviewed at more than 10 years)

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**SUMMARY :** Fifty-six patients (51 males and 5 females) were reviewed more than 10 years after surgical fasciectomy for Dupuytren's disease (average 12 years 7 months). 76 hands were operated upon (20 bilateral cases) for a total of 137 fingers (out of 152 affected digits). The average pre-operative score based on Tubiana's classification was of 4.28. To-date, at maximum follow-up time, it is of 2.45. 34 recurrences occurred before re-operation (i.e. 45 %), whereas at maximum follow-up, 74 % of hands are still defective, although only 22 % cause functional impairment. The method of improvement ratio classifies patients into two categories : satisfactory results and failures. This original method of qualification emphasizes three negative factors : recurrences, initial severity of disease, and failure to achieve full finger extension post-operatively. Results as a whole are in accordance with those mentioned in literature. Improved results depend on early surgery for severe cases, which must therefore be diagnosed at an early stage. Surgery often sets back the disease, without curing it. Further efforts in fundamental research on the etiology of this disease will be needed.

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**KEY-WORDS :** Dupuytren's contracture. — Surgical fasciectomy. — Diathesis.

Over the last decade, several authors [6, 12, 18, 20] have surveyed the long term evolution of hands operated on for Dupuytren's contracture. All series, except Dickie's [3], report a recurrence rate ranging between 50 and 70 %. Hueston [7] stressed the diathesis concept, i.e. ethymologically, the predisposition to develop the disease. This notion should be emphasized, as it is not limited to predisposition to recurrences, it affects the overall surgical outcome, based on data obtained from a homogeneous series of 76 hands operated on with the same technique by the same surgeon (PV) and reviewed in the long term by an independent examiner (JPV).

### MATERIAL AND METHOD

Between 1967 and 1980, Pierre Valentin (†) performed surgery on 181 patients for unoperated Dupuytren's contracture. In 1990, more than 10 years after surgery, 155 patients were recalled for review (the remaining 26 were not, on account of their advanced age). 56 patients were examined (36 never answered, 39 had

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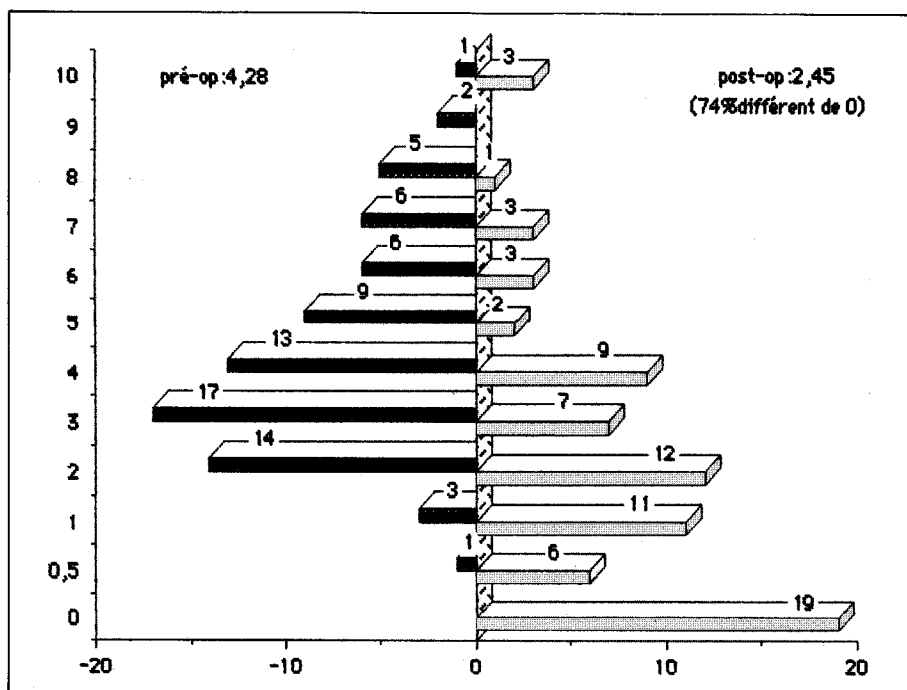


Fig. 1. — Results (Tubiana's score).

Fig. 1. — Résultats (selon échelle de Tubiana).

Fig. 1. — Resultados (según la escala de Tubiana).

moved, 13 were dead and 11 answered a questionnaire as they were unable to come). Only the 56 patients who were examined (51 males, 5 females) were included in the study : they total 76 hands (20 bilateral cases). The 36 unoperated hands (only 22 of which were unaffected by the disease at time of surgery) served for evaluation of the severity of diathesis. The average age of patients at surgery was of 53 years 3 months (ranging from 22 to 72) and the average follow up was of 12 years 7 months (from 10 to 22 years).

Favoring factors were systematically investigated, and a positive family history was recorded in 31 out of 76 cases, personal antecedents, such as diabetes or epilepsy in 12 out of 76 cases, associated lesions in 7 cases only (Ledderhose or Lapeyronie). 66 % of patients have clear eyes. Functional impairment was present in 54 cases before surgery (71 %). The average pre-operative cotation was of 4.28 according to Tubiana's simplified classification [23] (fig. 1). In the majority of cases, the disease was mono, bi and tridigital, rated stage II or III as often as stage IV. 152 digits were affected, of which only 137 were treated univocally by regional fasciectomy using an elective palmo-digital incision and immediate closure according to Tubiana's technique [24]. Skin grafting was never performed. Rehabilitation generally was not undertaken until 15 days postop. Full extension of operated digits was obtained in 57 hands (with a specific procedure on the PIP joint in

TABLE I. — Improvement coefficient.  
 TABLEAU I. — Coefficient d'amélioration.  
 TABLA I. — Coeficiente de mejoría.

* Improvement coeff. :	Post-op score - pré-op score
	Pré-op score
IC $\geq$ 80 % : Excellent }	Satisfactory
80 % IC $\geq$ 50 % : Good }	Unsatisfactory
50 % > IC $\geq$ 0 : Poor }	
0 > IC : Failure }	

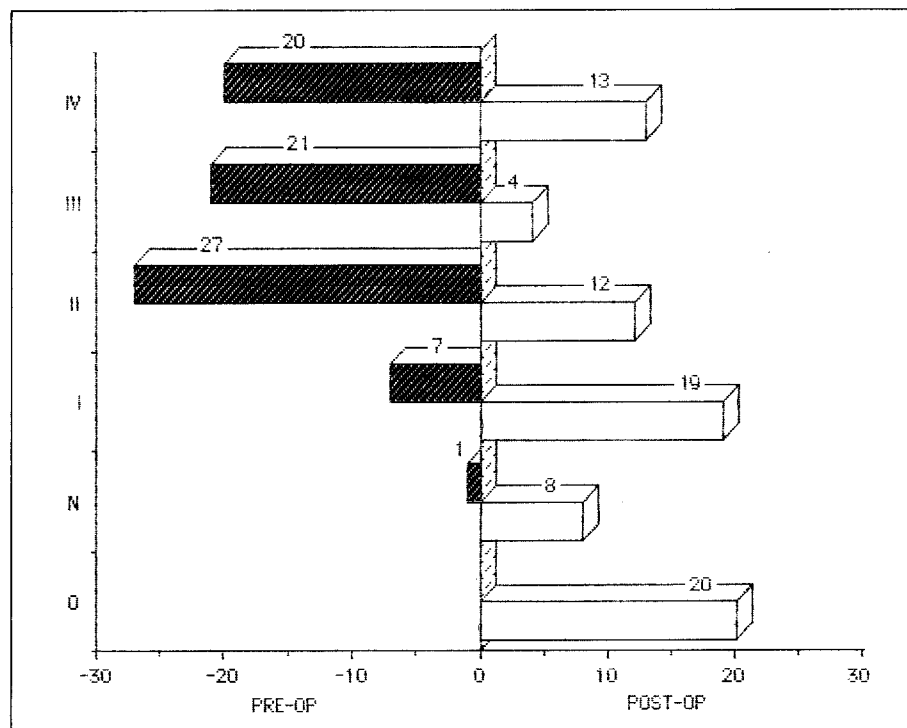
14 cases) [2]. In 19 cases full extension was not achieved post-operatively (despite PIP capsulectomy performed in 4 cases). There were few surgical and post surgery complications thanks to improved anatomical knowledge [15, 16, 21] (3 cases of severed collateral nerves, 2 major scar non-unions, one algodystrophy), which did not affect the quality of final result. Additional surgery had to be performed on 14 hands (because of recurrence or extension), which altered the quality of results at time of review in only half of cases.

At maximum follow-up, three different ratings were applied : Tubiana's classification [23], improvement rating and subjective results. In addition, recurrences and/or extensions were carefully assessed, including their location, severity, date of occurrence, functional impairment, number of affected digits. The improvement rating (table I) subdivides treated hands into four categories (excellent, good, poor, fai-

**Fig. 2. — Results (Tubiana's score).**

Fig. 2. — Résultats (selon échelle de Tubiana).

Fig. 2. — Resultados (según la escala de Tubiana).



lure) combined into two main groups (satisfactory, unsatisfactory) for the sake of further statistical analysis of causes of failure. The reason for using this classification was two-fold :

- the diversity of pre-operative conditions was too great to assess results on the basis of objective post-operative appraisal only ;
- assessment cannot be limited to the mere improvement rating (difference between pre- and post-operative ratings). For instance, a 5-point improvement represents a total success when the pre-operative rating was of 5, whereas it is only a poor result for an initial rating of 15, as the post-operative rating for that hand is of 10 only.

The improvement rating therefore takes both pre- and post-operative condition into account. For the sake of clarity, the case of two patients can be compared. Patient X's 4th and 5th digits present a moderate contracture, stage II, rated 4. Surgery only results in a slight improvement, rated 3 : he only gained 1 point whereas the maximum theoretical improvement is 4 ; thus resulting in a 25 % improvement, which is insufficient. Patient Y is rated 10 pre-operatively, which corresponds to very severe pluridigital lesions. Post-operatively, he is delighted to achieve a moderate lack of motion of the last three fingers, thus improving his rating to 3 : he gained 7 points, out of a maximum of 10, which corresponds to 70 % improvement, rated

Good. The difference in improvement rating (20 and 70 %) clearly expresses the diversity of surgery outcome.

## RESULTS

### Overall results based on absolute improvement

At maximum follow-up, the average score of operated hands was of 2.45 (fig. 1). Figure 2 shows the post-operative distribution based on anatomical stage.

### Improvement rating

Classification of the 76 reviewed hands shows 32 excellent results (IR  $\geq 80\%$ ), 21 good results (IR between 50 and 80 %), 16 poor results (IR from 0 to 50 %) and 7 failures (negative rating). Thus, 70 % of patients have satisfactory results, whereas 30 % can be considered as unsatisfactory. Average improvement is of 1.83, ranging from 2.44 for very good results to - 2.42 for failures (fig. 3).

### Improvement rating and patient's opinion

Further analysis of results is corroborated by the correlation between evaluation by the IR method and the patient's subjective opinion (fig. 4), by demonstrating the superposition of anatomical and functional results.

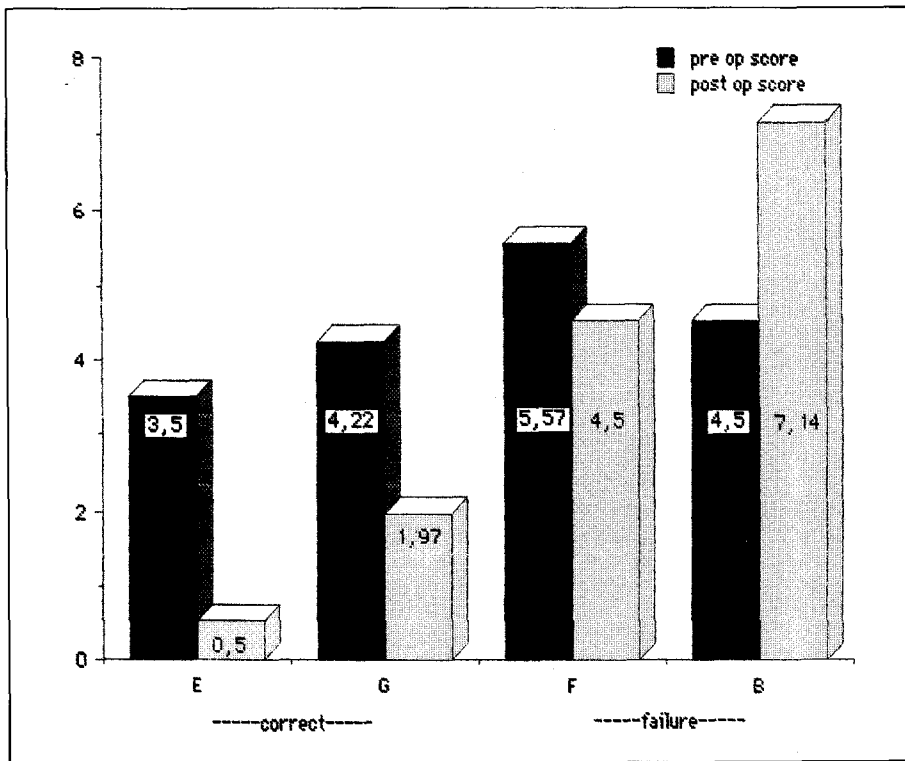


Fig. 3. — Results (Improvement coefficient rating).

Fig. 3. — Résultats (selon le coefficient d'amélioration).

Fig. 3. — Resultados (según el coeficiente de mejoría).

Fig. 4. — Correlation between subjective rating and improvement coeff. rating.

Fig. 4. — Corrélation entre le coefficient d'amélioration et l'appréciation du patient.

Fig. 4. — Correlación entre el coeficiente de mejoría y la apreciación del paciente.

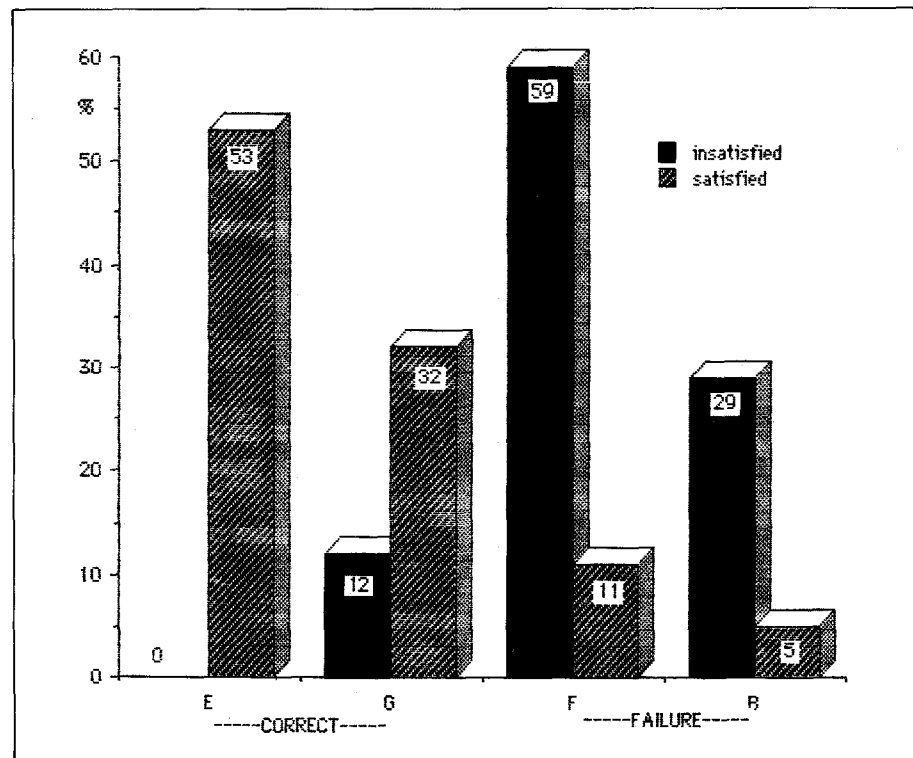
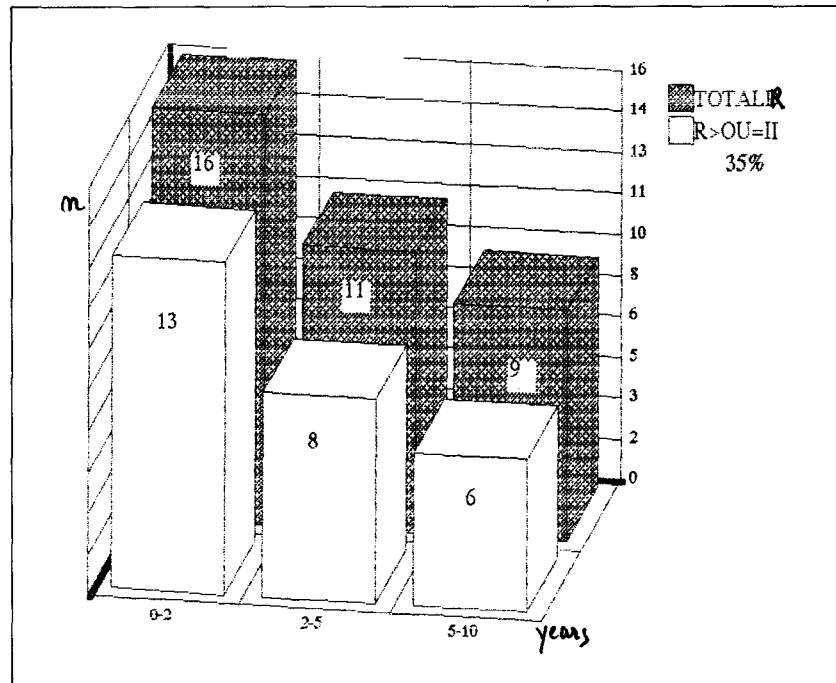


Fig. 5. — Results : recurrences.

Fig. 5. — Résultats : récidives.

Fig. 5. — Resultados : recidivas.



### Recurrence

Recurrence occurred in 29 hands (38 % of the series), 10 of which were associated with an extension. It included 12 hands at stage IV (5 of which were amputated), 2 at stage III, 7 at stage II (2 of which D+), 5 at stage I and nodular stages. Those presenting potential impairment (over 2 D+) therefore account for 21 % of the series. An isolated extension was present in 16 cases (21 %) : the global « activity » is therefore of 59 % ; however, if hands which had been reoperated for recurrence and remained disease-free after reoperation were taken into account, the total « activity » was of 47 %, or 36 hands. A review of results according to preoperative condition shows that a recurrence occurred in 8 out of 27 stage II, 8 of 21 stage III and 11 of 20 stage IV. Generally, the higher the initial stage, the more severe the recurrences. They occurred in 16 cases during the first two years post-op, in 11 cases before 5 years and in 9 cases after 5 years, the most severe cases appearing earlier (fig. 5).

### Reoperated patients

Fourteen patients underwent a secondary operation. After reoperation, half classified as satisfactory, whereas the other half (7 patients) were failures.

Before reoperation, the failure rate was thus close to 40 % (30 hands). Five failures are amputations of the little finger, which do not necessarily represent a functional calamity : those are failures of the method which we consider, perhaps too critically, as therapeutic failures.

## DISCUSSION

### Prognosis factors

A multi-faceted study of the causes of long term failure can be obtained based on the distinction between two categories of patients (satisfactory results/failures), depending on the improvement rate. Failures are caused, in the first place, by recurrences, then by the severity of initial affection, and finally by unsatisfactory operative results (i.e. incomplete postoperative extension of digits). All these factors are interdependent and the main cause can be found in the severity of diathesis : recurrence contributes to bad results, and is more likely to occur in the case of a severe initial condition, which in turn can result in technical problems which may not be solved entirely.

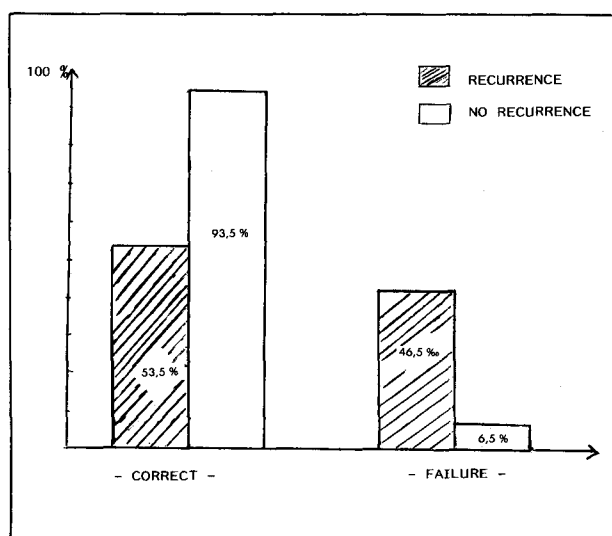


Fig. 6. — Influence of recurrence on late result.

Fig. 6. — Influence d'une récidive sur le résultat final.

Fig. 6. — Influencia de una recidiva sobre el resultado final.

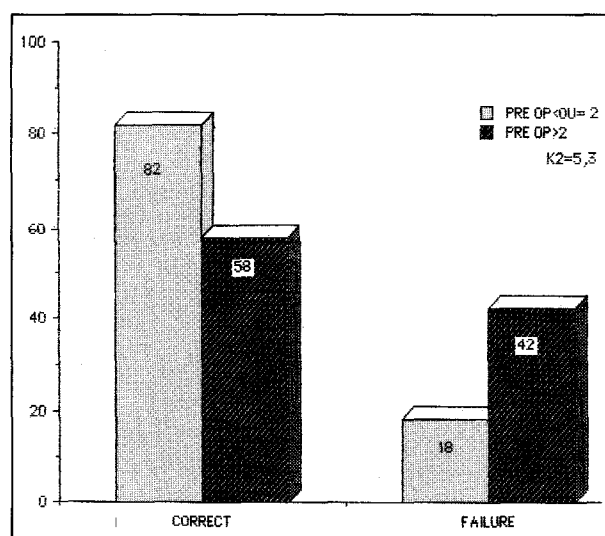


Fig. 7. — Influence of high level disease.

Fig. 7. — Influence de la gravité de la maladie.

Fig. 7. — Influencia de la severidad de la contractura.

*Recurrence or extension adversely affects final prognosis*

Out of 23 failures, only 2 hands were recurrence-free, whereas this applies to 29 hands out of 53 successful results (S+) (fig. 6). The importance of initial condition can also be emphasized by analyzing the evolution of the unoperated controlateral hand in the two categories: on average, the difference between the initial condition and maximum follow-up is of 1.06 for satisfactory results, whereas it is of 2.42 for failures. This variation in the evolution is clearly indicative of the notion of predisposition. We have researched those factors which can influence recurrence (table II). In our series, only the severity of initial condition has an actual influence statistically: a condition which is li-

kely to develop into an advanced stage carries the probability of recurrence. Conversely, other factors, including the existence of associated lesions, sex, age of onset, personal or family antecedents have no influence, at least statistically, in this particular series, which may prove too homogeneous.

*The gravity of initial condition favors recurrences, as stated above, but also represents an independent factor of failure*

It seems logical to state that the more severe the initial condition, the more difficult it is to treat. In fact, at maximum follow-up for pre-operative stages I, II, III and IV, the percentages of stage > 2 were of 0 %, 18.5 %, 43 % and 70 % respectively. Similarly, there were 24 pre-operative stages  $\geq 3$  among the 53 satisfactory results, whereas there were 17 among the 23 failures (fig. 7) ( $K2 = 5,3$  S+).

*Failure to achieve PIP joint extension is the last factor*

In 19 cases PIP extension has not been achieved; in 9 cases results were satisfactory, whereas failures occurred in 10 cases; whilst 44 good results and only 13 failures were experienced when extension was achieved (57 cases) (fig. 8) ( $K2 = 6$  S+++).

The causes for the 23 bad results can be summarized, separately or in association, as follows: 21 recurrences, 17 initial condition  $\geq 3$ , and 10 incomplete post-operative results. Ho-

TABLE II. — Recurrence factors.  
TABLEAU II. — Facteurs de récidives.  
TABLA II. — Factores de recidiva.

	All patients	Without R	
Male	89 %	85 %	S-
Op. age (years)	44,3 y	45,63 y	S-
Family disease	39,5 %	40,5 %	S-
Ect. loc.	9 %	6,5 %	S-
Associated disease	14,5 %	17 %	S-
PIP extension	72 %	73 %	S-
Initial grad.	4,28	3,86	S+

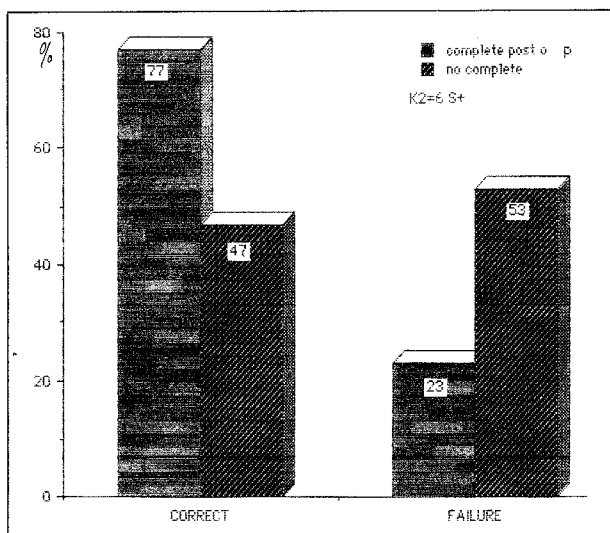


Fig. 8. — Influence of non complete PIP extension.

Fig. 8. — Influence de l'extension incomplète de l'IPP.

Fig. 8. — Influencia de la extensión incompleta de la IFP.

wever, non-operated digits, joint stiffness in extension, and scar contractures were not statistical causes of failure.

#### Comparison with data in existing literature

Our recurrence rate (45 %) may be considered optimistic when compared with other series reviewed in the long term [6, 12, 18, 20]. Actually, it is not : our cases have a less severe diathesis, and therefore a reduced evolution in time, as scored in our study of traditional factors of recurrence (table II), where one should note the low rate of ectopic deposits and the absence of very young patients. The identical rates of further surgery (18.5 %) and of potential impairment (27 %), in our series and that reviewed by Leclercq and Tubiana [12] seem to confirm that diathesis does not affect results through recurrences only. Also, one should note the great similitude in the percentage of stages others than 0 as compared with the series of Norotte & Apoil [20] (74 % for the authors vs. 71 % for the latter).

As stressed by Hueston [8] and Millesi [19], we note that recurrences sometimes occur in the very long run, but that the most severe ones appear early.

Technically, the present tendency is to prefer limited intervention [1, 22], favoring an extensive use of skin grafting [4, 9, 10, 25]. The initial approach does not seem to affect the quality of final results [5, 13, 14, 17], and this is confirmed by our series for which one method was adopted, and whose results are identical to

those of other authors who have adopted different techniques.

#### CONCLUSION

Diathesis, i.e. the propensity to develop the disease must be the basis of treatment, as it affects results in three ways : post-operative recurrences, the severity of initial condition, and technical problems involved.

Recurrences in operated Dupuytren's contractures seem to occur in about half of cases. At 10 years, only 22 % of treated hands (17 cases) complained of functional impairment, vs. 70 % before surgery. The benign character of some of these recurrences at 10 years' interval should therefore be emphasized, although one cannot be sure this will also be the case in the long run.

However there are 24 failures (31.5 % of operated hands) at maximum follow-up, which were 31 (i.e. 41 %) before successful reoperations. Furthermore, 57 hands are still not strictly normal upon completion of the therapy which must therefore be improved.

Lately, major technical improvements have been achieved by reducing recurrences through skin grafting, by improving immediate results of surgery (PIP joint checkrein) [26] and maintaining them post-operatively through rehabilitation. Better results could be obtained through earlier surgery on potentially aggressive cases, and prospective clinical studies are therefore required for an early identification of the disease which is likely to develop into the most severe stages. Fundamental studies [11] may, in the long term, reduce recurrences to a minimum, and even offer a non-surgical etiological treatment of the mysterious Dupuytren's contracture.

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**RÉSUMÉ** : Cinquante-six patients opérés d'une maladie de Dupuytren (51 ♂ et 5 ♀) ont été revus avec plus de 10 ans de recul (recul moyen = 12 ans 7 mois). Ils regroupent 76 mains opérées (20 cas bilatéraux), soit 137 rayons (sur 152 atteints). La cotation préopératoire moyenne était de 4,28 selon l'échelle de Tubiana et elle est au plus long recul de 2,45. Il existe 34 récurrences avant réintervention (soit 45 %) alors qu'au plus long recul 74 % des mains ne sont pas parfaites. Pourtant 22 % des mains seulement sont gênantes. La méthode du coefficient d'amélioration permet le classement des opérés en deux catégories : résultats satisfaisants et échecs. Cette qualification originale du résultat permet de reconnaître trois facteurs péjoratifs : les récurrences, la gravité initiale de l'atteinte, la non-obtention de l'extension complète des rayons opérés en postopératoire. Les résultats sont globalement concordants avec ceux de la littérature. L'amélioration des résultats passe par une chirurgie plus précoce des formes graves qu'il faut donc savoir dépister à leur stade de début. La chirurgie fait plus souvent reculer la maladie qu'elle ne la guérit et seuls des progrès de recherche fondamentale sur l'étiologie de cette affection permettront d'approcher la guérison de cette mystérieuse rétraction.

**MOTS-CLÉS** : Maladie de Dupuytren. — Aponévrectomie. — Diathèse.

VIGROUX J.P., VALENTIN P. (†). — Historia natural de la contractura de Dupuytren operada mediante aponeurotomía local. Influencia de la diátesis (76 manos revisadas a más de 10 años).  
*Ann Hand Surg*, 1992, 11, n° 5, 367-374.

**RESUMEN** : Cincuenta y seis pacientes operados de una contractura de Dupuytren (51 hombres y 5 mujeres) fueron controlados con más de 10 años de seguimiento (Seguimiento promedio = 12 años y 7 meses). Estos representan en total 76 manos operadas (20 casos bilaterales), para un total de 137 rayos (sobre 152 alterados). El puntaje preoperatorio promedio era de 4,28 según la escala de Tubiana y este es en el seguimiento más avanzado de 2,45. Se hallaron 34 recidivas antes de la reintervención (oséa 45 %) mientras que en el seguimiento más avanzado 74 % de las manos no son perfectas. Sin embargo solamente 22 % de las manos son sintomáticas. El método del coeficiente de mejoría permite la clasificación de los operados en dos categorías : resultados satisfactorios o fracaso. Esta clasificación original del resultado permite reconocer tres factores peyorativos : las recidivas, la gravedad del compromiso inicial, la imposibilidad de obtener la extensión completa del rayo en postoperatorio. Los resultados son globalmente cercanos a aquellos de la literatura. La mejoría de los resultados tiene relación con una intervención realizada más precozmente en las formas severas las cuales deben ser, por lo tanto, descubiertas en su fase precoz. La cirugía permite lo mas frecuentemente un retroceso de la enfermedad pero no la cura y solamente los progresos en investigación fundamental sobre la etiología de esta afección permitirán obtener la cura de esta misteriosa retracción.

**PALABRAS CLAVES** : Contractura de Dupuytren. — Aponeurotomía. — Diátesis.