PROGNOSIS AND TREATMENT OF DUPUYTREN'S CONTRACTURE

Raoul Tubiana

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It is currently admitted that the prognosis for Dupuytren's contracture is unpredictable, since it is influenced by certain factors which are still obscure. We propose to analyze these factors, in order to establish a more effective treatment for this condition.

In order to clarify this report and to evaluate the lesions, we have adopted Meyerding's classification of five stages of contracture, as modified by Einarsson, which follows:

"Grade 0: Nodules in the palmar aponeurosis, sometimes involving the skin, but no flexion deformity."

"Grade I: In addition to the conditions already mentioned, major or minor flexion deformity of one finger only."

"Grade II: Flexion deformity of more than one finger, nowhere attaining 60 degrees."

"Grade III: Flexion deformity of more than one finger, exceeding 60 degrees in at least one."

"Grade IV: Major or minor flexion deformity of all fingers."

This classification is not exempt from criticism but has the merit of having been used by numerous authors.

We have classified the postoperative results as follows:

Very good: Hands normal, both in appearance and in function;

Good: Hands in which a mild deformity persists, but which show much improvement as compared with their previous state;

Fair: Hands in which the improvement is less marked;

Poor: Hands in which there is either no improvement or deterioration.

STUDY OF THE ETIOLOGICAL ELEMENTS IN THE PROGNOSIS

This study of etiological factors, based on 100 cases of Dupuytren's contracture followed at the Clinique de Chirurgie Orthopédique et Réparatrice de la Faculté de Paris, has given us only limited information on the prognosis.

The hereditary tendency of this condition was found in about 15 per cent. of our cases. This tendency does not seem to influence unfavorably the operative results, except in certain cases of extreme atypical deformity, often localized in one finger, which can be found in members of the same family; the operative prognosis appears to depend principally on the degree of flexion.

Manual work does not seem to influence the incidence or the degree of deformity or the operative results, but the bilaterality of the lesions is noted much more frequently in manual workers,—in sixteen of twenty-five cases, as compared with non-manual workers, of whom six of thirty-five were affected bilaterally.

We have systematically inquired about previous injury and have found that in about one-third of our patients, fractures, wounds of the hand, of the forearm, or of the shoulder had preceded the palmar thickening. Dupuytren's contracture occurred bilaterally in eighteen patients; in only four of these patients (eight hands) the lesion occurred after bilateral traumatic injuries. In fourteen patients, it occurred unilaterally and always on the side of the injury. Neither the severity of the lesions nor the operative results were influenced by these previous injuries.
TABLE I

INFLUENCE OF AGE ON CERVICAL ARTHRITIS AND DUPUYTREN'S CONTRACTURE

<table>
<thead>
<tr>
<th>Ages</th>
<th>Total No. of Cases in Each Series</th>
<th>Patients with Dupuytren's Contracture</th>
<th>Patients without Dupuytren's Contracture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>X-Rays Normal Arthritis</td>
<td>X-Rays Normal Arthritis</td>
</tr>
<tr>
<td>0-19</td>
<td>1</td>
<td>1 0</td>
<td>1 0</td>
</tr>
<tr>
<td>20-29</td>
<td>3</td>
<td>3 0</td>
<td>3 0</td>
</tr>
<tr>
<td>30-39</td>
<td>3</td>
<td>2 1</td>
<td>3 0</td>
</tr>
<tr>
<td>40-49</td>
<td>9</td>
<td>7 2</td>
<td>6 3</td>
</tr>
<tr>
<td>50-59</td>
<td>11</td>
<td>2 9</td>
<td>4 7</td>
</tr>
<tr>
<td>60-69</td>
<td>2</td>
<td>0 2</td>
<td>0 2</td>
</tr>
<tr>
<td>70-79</td>
<td>1</td>
<td>0 1</td>
<td>0 1</td>
</tr>
<tr>
<td>Totals</td>
<td>30</td>
<td>15 15</td>
<td>17 13</td>
</tr>
</tbody>
</table>

From our limited experience, we have not been able to establish whether the existence of associated lesions, such as knuckle pads or periarthritis of the shoulder, have any particular prognostic significance. They did not appear to have had any influence on the immediate postoperative results, but such a condition was observed in one of the four cases in which there was recurrence.

Padovani and Lord have drawn attention to cervical lesions in Dupuytren's contracture. We have made roentgenograms of the cervical spine in a series of thirty cases of Dupuytren's contracture; half of them showed arthritis at the level of the fifth and sixth cervical vertebrae. Roentgenograms made in a similar series of normal subjects of the same age showed a comparable incidence of arthritis (Table I).

Has the presence of cervical arthritis any influence on the prognosis of Dupuytren's contracture? With this question in mind, we have compared two series of patients, one group with and one without cervical arthritis. The influence of cervical arthritis on prognosis appears to be negligible. We have observed a greater frequency of bilaterality in patients with arthritis, but this finding seems scarcely to have influenced the degree or the development of the deformity or the operative sequelae of this condition.

It seems logical that the presence of trophic disturbances, such as cold hands, oedema, or hyperhidrosis, could influence the operative prognosis. We have only rarely encountered such conditions, and, in cases in which operation was carried out we have performed a stellate-ganglion block before and after operation.

We have operated on patients with the following conditions with satisfactory results: a patient who had Dupuytren's contracture associated with Raynaud's disease; a young woman in whom the contracture followed an acute shoulder-hand syndrome; and several other patients with less marked signs of sympathetic hyperactivity.

It also seems natural to suppose that advanced age may influence the operative prognosis, but the results, as shown in Table II, are less pronounced than might be expected. Indeed, the group of our patients between twenty and thirty years of age have had the least number of satisfactory results.

One etiological factor which seems to influence the results is epilepsy, but our experience with this condition is very limited*. The four epileptic patients whom we have observed had already been operated upon once, and they all showed marked sequelae. These patients had taken barbiturates for years and continued to take them after the operation.

* Since writing this article, seven additional cases of Dupuytren's contracture have been seen in epileptic patients; in five of these there was extensive involvement affecting the thumb as well as the other fingers on both hands; three patients had plantar nodules. All of these patients had received barbiturates.

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TABLE II

RESULTS OF APONEURECTOMY AS RELATED TO THE AGE AND GRADE

<table>
<thead>
<tr>
<th>Classification as to Grade</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very Good</td>
</tr>
<tr>
<td>Age (Years)</td>
<td></td>
</tr>
<tr>
<td>0-9</td>
<td>4</td>
</tr>
<tr>
<td>10-19</td>
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<tr>
<td>20-29</td>
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<tr>
<td>30-39</td>
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<tr>
<td>40-49</td>
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</tr>
<tr>
<td>50-59</td>
<td>11</td>
</tr>
<tr>
<td>60-69</td>
<td>11</td>
</tr>
<tr>
<td>70-79</td>
<td>2</td>
</tr>
<tr>
<td>Totals</td>
<td>56</td>
</tr>
</tbody>
</table>

operation. It is possible that barbiturate intoxication is in part responsible for the development of Dupuytren's contracture in epileptics, as has already been suggested by Lund and Skoog; perhaps Dupuytren's contracture also occurs in patients with other conditions for which barbiturates are used, as in patients with angina pectoris or with painful shoulder syndromes. From these observations, it appears that barbiturate therapy should be discontinued, when feasible, in patients in whom palmar contracture is found.

LOCAL ELEMENTS IN THE PROGNOSIS

The combined review of our cases with J. I. P. James of London, which was presented in Paris at the Congrès Français de Chirurgie Orthopédique in 1952, suggested that local factors are of considerable importance.

The extent of the lesions as a prognostic gauge can be appreciated from Table III, in which the end results are evaluated in relation to the grade of the contracture. The patients who were operated upon early, when the contracture was manifested by palmar nodules only (Grade 0), have all had excellent results.

This classification, first proposed by Meyerding and modified by Einarsson, provides only an incomplete prognostic measure, for it does not take into account trophic disturbances or the state of the skin. It is evident that, whatever the grade of contracture, there is a great difference between skin which has a good blood supply and a subcutaneous

TABLE III

RESULTS OF APONEURECTOMY AS RELATED TO GRADE

<table>
<thead>
<tr>
<th>Classification</th>
<th>No. of Hands</th>
<th>Very Good (No. of Hands) (Per cent.)</th>
<th>Good (No. of Hands) (Per cent.)</th>
<th>Fair (No. of Hands) (Per cent.)</th>
<th>Poor (No. of Hands) (Per cent.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 0</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Grade I</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Grade II</td>
<td>14</td>
<td>6</td>
<td>6</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Grade III</td>
<td>27</td>
<td>9</td>
<td>7</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Grade IV</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Totals</td>
<td>56</td>
<td>24</td>
<td>43</td>
<td>19</td>
<td>11</td>
</tr>
</tbody>
</table>
layer composed of cellular and fatty tissue, which can be easily mobilized over the deeper planes, and skin which is thickened, infiltrated with fibrous tissue, and adherent to the aponeurosis.

However, without minimizing the prognostic importance of the state of the skin, we now preserve almost the whole extent of the skin, and we find that it survives satisfactorily in the majority of these cases.

In addition, this classification does not sufficiently take into account the prognostic significance of the site of the deformity. When the fingers are flexed, a distinction must be made between the contracture located at the metacarpophalangeal joint and that of the interphalangeal joints. The lateral ligaments of the metacarpophalangeal joint are stretched over the projections of the metacarpal condyles in flexion; they cannot retract in this position. The cases of Dupuytren's contracture in which only these joints are bent recover an excellent mobility.

When the proximal interphalangeal joints are affected, alone or conjointly, the problem is much more difficult. The recovery of full extension is sometimes possible at this level; however, when the deformity is marked and of long-standing, extension often remains limited despite the removal of aponeurotic bands, because of the presence of capsular contractures. For this reason, it is advised that removal of the palmar fascia be done either before or at the time of the first signs of contraction of the proximal interphalangeal joints.

Deformities at the level of the distal interphalangeal joints also have a prognostic significance. These joints are infrequently affected and are generally held in flexion. In certain cases, particularly those involving the fifth finger, the distal interphalangeal joints are in the position of hyperextension; Iselin and Dieckmann interpret this as an indication of the development of the disease to a marked degree and of bad functional prognosis, since the hyperextension implies contraction of the interossei or of the dorsal aponeurosis leading to the extensor apparatus.

Roentgenographic study of the involved joints can also be of value in prognosis; in some cases, signs of degenerative arthritis are found, but we believe them to be rare.

Dupuytren's contracture localized in the fifth finger should be considered separately from the prognostic point of view. Desplas and Tostivint have already noted the tendency for recurrence; and, with J. I. P. James, we have noted the frequency of complications in this digit.

We have operated eight times on contractures in the fifth finger. Five patients had previously been operated upon; in two patients we operated because of recurrences and in three because of bad results immediately following the first operation. In the other three cases in which we had undertaken the treatment of this condition, there was a local relapse which led us, in one case, to perform an arthrodesis of the proximal interphalangeal joint in 40 degrees of flexion, and, in another case, to use a skin graft in order to cover the loss of cutaneous substance after the straightening of the finger (a limitation of 40 degrees of extension still remains). Only one patient has had a good end result.

The gravity of the prognosis for the type of deformity which affects the fifth finger can be explained by the special anatomy which is present; although the condition is confined to a single finger, there is often widespread involvement. The distal joint was affected in all of our patients, and in two there was hyperextension. The aponeurotic expansions had adhered to the tendons of the hypothenar muscles, to the transverse metacarpal ligament, and to the hypothenar aponeurosis. Lastly, the relatively small size of this finger makes the dissection more difficult.

**PROGNOSIS BASED ON HISTOLOGICAL STUDY OF THE LESIONS**

Meyerding and his colleagues¹ believe that histological examination of the pathological tissue can assist in forecasting the end result. They assumed that "the cellular na-
ture of the fascia [described] indicates the activity of the proliferative process". In cases in which the condition recurred postoperatively, they found the tissue to be relatively immature, but without evidence of increased inflammatory activity.

Histological study undertaken by Dr. Nezelof on our specimens has not, up to the present, given us any indication regarding prognosis, since each anatomical section discloses variable histological appearances.

**THERAPEUTIC INDICATIONS**

Two factors seem to be of considerable importance in the prognosis: the choice and quality of treatment. Dupuytren’s contracture is often only slightly troublesome until an advanced stage of its development, but the results of treatment are much better if surgery is performed early. However, when the condition is at the stage of isolated palmar nodules, we believe, as do the majority of those who have written on the subject, that it is preferable not to operate, since the lesions may remain stationary or may even partially regress spontaneously. When the condition shows a tendency to progress, especially when the interphalangeal joints

![Fig. 1-A](image1.png)  ![Fig. 1-B](image2.png)

Photographs showing retraction involving both metacarpophalangeal and interphalangeal joints.

![Fig. 1-C](image3.png)  ![Fig. 1-D](image4.png)  ![Fig. 1-E](image5.png)

Photographs showing results of operation.
are affected, it is our opinion that immediate surgery should be undertaken.

One may question whether the symptomatic treatment by local excision of the infiltrated fascia is sufficient; in the present state of our knowledge, once the condition has passed a certain stage, removal of the palmar fascia remains the sole effective treatment.

Are there contra-indications to surgery? Trophic or vasomotor disturbances and age constitute factors which influence the prognosis, but these are not necessarily absolute contra-indications to operation. In such cases, one must adopt a therapeutic procedure which avoids extensive surgery. If incomplete results satisfy the surgeon, limited operation may be employed. Local injection of hydrocortisone is sometimes used for adjunctive treatment. Simple fasciotomy, in ambulatory patients, allows the fingers to extend from the palm, but one cannot hope to obtain results which are comparable in their quality and in their duration to those of fasciectomy, particularly when the deep aponeurotic septa are contracted. A blind operation becomes particularly hazardous at the level of the fingers, where the digital nerves are often displaced. Palmar fasciotomy has some value in elderly patients and, occasionally, in patients with very severe contractions in order to clean the hand in preparation for further surgery. It can also be a useful manoeuvre at the beginning of aponeurectomy to facilitate the dissection.

The removal of the palmar fascia, including all the palmar and digital area involved, is the only procedure which gives a good percentage of excellent results. It is the operation of choice for the surgeon who has experience with this condition.

**TECHNIQUE OF APONEURECTOMY**

Aponeurectomy is performed under a general anaesthetic and with a pneumatic tourniquet. The hand is fixed on an adaptable operative splint, such as the one which we have designed (Fig. 2).

The lines of incision must offer a wide exposure of the palmar and digital lesions, and the final scars must remain "physiological", as so appropriately expressed by Bunnell.

The standard approach to the palm is a transverse incision in a crease, usually the distal crease. Most of the time it is sufficient, without other débridement, to extend it from the second intermetacarpal space as far as the ulnar border. The elongation proximally along the hypothenar eminence or an incision in the thenar crease have been given up as unnecessary. At the level of the fingers, we use either a lateral longitudinal incision at the junction of the dorsal and palmar skin when the digital nodules are lateral or, like McIndoe, a vertical incision in the mid-line of each affected phalanx, which is made horizontal.
by using a Z plasty. This last process gives a wider exposure of the digital lesions and allows one to take advantage of the maximum amount of skin available.

An intact area remains between the palmar and digital incisions, and one may be tempted to simplify the dissection by using, like Iselin, a vertical incision on which as many Z plasies are made as there are segments.

This transposition of Z-flaps, pleasing as they are, may lead to sloughing at the angles when the skin is thick and devascularized; this sloughing may occur more frequently in the palm than on the fingers.

The extent of the aponeurectomy should be decided by the nature of the lesion and the general conditions. Our excision usually includes the three medial palmar spaces and the involved fingers. It is more limited in older patients and those with trophic disturbances. Since Dupuytren's contracture rarely affects the index finger and thumb, the palmar fascia to these two rays has not usually been removed. To do so would considerably extend the operation.

The procedure is as follows:

After the incision at the distal palmar crease, the skin is separated by meticulous dissection from the fascia, first in the proximal part of the palm. This is made easier by starting in the normal tissue at the side and working centrally toward the adherent skin. Then, after the edges of the upper part of this triangular fascia have been freed, the aponeurosis is elevated by traction forceps. At this level, there are no deep septa and a smooth spatula can be slid under the fascia to clear the median nerve and the vessels. After this has been done, the fascia is drawn tense and can be cut with safety under direct vision, slightly above the level of the superficial palmar arch, which may be located by abducting the thumb and drawing a line from the medial border to the center of the palm. It is probably unnecessary to excise more proximally, because no recurrence has been noted in this region of the palm.

Next, the distal skin is freed; it will usually be more extensively adherent than the skin in the proximal half. The dissection is carried down to the level of the webs and the base of the fingers.

Fig. 3
Exposure of operative field by incision in the transverse palmar crease.
The aponeurosis is then detached by working from the proximal portion of the wound to the distal portion. Care must be taken to avoid all the important structures, which are systematically sought for and retracted, such as the neurovascular bundles and the flexor tendons and their sheaths. They can always be freed as they are anatomically separate, however advanced the disease. One must not forget, in particular, to locate and preserve the digital branch of the ulnar nerve of the fifth finger, which is situated far medially.

The fascial septa start at the level of the proximal palmar crease. They extend distally on each side of the flexor tendons attached to the superficial and deep palmar fascia and send fibers to the metacarpals; a prolongation to the phalanges contributes to the maintenance of the contracture. Complete section usually allows total extension of the proximal phalanx.

After the division of all the deep septa, the fascia will now be attached only by its digital extensions. In an early case, with no diseased digital fascia, a little blunt dissection will divide the normal digital extensions and the fascia will come away in one piece.

When the digital aponeurosis is infiltrated, it must also be removed. To understand this portion of the operation, it may be helpful to recall the anatomy of the various fibrous formations, which have been described previously (Fig. 6).

At the web, below the division of the neurovascular bundle, is a pad of fibrous tissue adherent to the web skin distally and the superficial transverse metacarpal ligament (natatory ligament) anteriorly. On either side it blends with the deep septal extension into the finger. The deep septum passes on into the finger, enclosing the lumbrical tendon between two layers. Only the resection of these transverse fibers at the web will allow lateral movement of the fingers. The digital slip, which is an extension of the superficial palmar fascia, passes deep to the vessels in the finger and blends with the extension of the deep septum. This septum inserts posteriorly into the lateral aspect of the first and second phalanx. It has numerous aponeurotic expansions which might undergo pathological changes: some, to the sides, surround the nerve and blood vessels; one, anterior to the
Anatomical disposition of the digital aponeurosis.

1: Superficial digital aponeurosis.
2: Deep septal extension into the finger.
2': Ventral expansions of the septum in front of the flexor tendon sheath.
3: Digital slip, extension of the superficial palmar fascia divided at the base of the finger.
3': Phalangeal attachment of digital slip. 4: Transverse fibers.
7: Web aponeurotic nodule. 8: Lumbrical tendon.

(Reproduced with modifications by permission of Masson et C°, from *Revue de Chirurgie Orthopédique*, 38: 355, 1952.)

flexor tendon sheath, reaches the opposite septum where it blends with the thin digital fascia which covers the anterior aspect of the finger like a tunnel; and one, posterior, is directed toward the extensor system.

These various aponeurotic formations are irregularly thickened and retracted; but it is of great importance, when they have undergone pathological changes, to remove them from their phalangeal attachments, if maximum extension at the interphalangeal joint is to be recovered.

Before undertaking excision of the fascia, one must begin by dissecting any digital nerves which are displaced laterally or medially, often in an unpredictable fashion. This is the most delicate part of the operation: if these nerves were cut, it would lead not only
to sensory disturbances but also to marked trophic complications.

It is of help to pull gently on the nerves liberated in the distal part of the palm, following them up to the root of the fingers, in order to locate them and then to isolate them at the level of the finger. The removal of the digital bands will allow a more or less complete extension of the second phalanx.

If a limitation of extension still persists, it indicates that there are other associated lesions, such as retraction of the fibrous sheaths of the tendons, which can be debrided, or articular retraction which we no longer attempt to remedy by direct approach. One must be content with imperfect extension at the level of the interphalangeal joints and not risk forcing these fragile joints by manoeuvres which might result in stiffness in extension. Limitations of flexion are always more troublesome than limitations of extension.

Prior to removing the cuff, when possible, the anaesthetist commences the controlled hypotension. The operated hand is elevated, and a solution of hexamethonium is injected intravenously.

Obviously, a good dissection will avoid the principal vessels, but sometimes, after the removal of the cuff and despite packing, diffuse bleeding persists at the level of the subcutaneous deep septa or from fatty tissue.

Completion of the operation under controlled hypotension has the following advantages:
1. It facilitates a careful hemostasis in a clean operative field, with minimal bleeding;
2. It allows one to reduce the time of the operations under tourniquet pressure, particularly in those operations which are completed with a plastic repair;
3. It avoids postoperative hematomata, circulation being restored to normal only after the establishment of a pressure dressing;
4. This ganglionic blocking agent appears to affect favorably the outcome of the operation.

We have now employed controlled hypotension in the Clinique de Chirurgie Orthopédique et Réparatrice de la Faculté de Paris in more than 500 selected cases without incident, under the guidance of Dr. Kern, the Chief Anaesthetist.

The candidates for controlled hypotension are carefully selected. All patients having any form of deficient oxygenation are eliminated, as for example:
- Patients with deficient respiratory exchange, including obese patients;
- Asthmatics, even those with good respiratory exchange, inasmuch as it is dangerous to block the sympathetic nervous system;
- Patients with coronary disease, with anaemia, and those in shock;
- Patients with renal deficiency;
- Patients presenting adrenal deficiency, as well as all patients with hypotension.

Our present choice of medication for controlled hypotension is Arfonad, which presents the advantage over the salts of methonium of having a brief duration of action. Elimination is so rapid that the drug must be administered intravenously at the rate of ten to twenty drops per minute of a solution of 0.5 milligram per cubic centimeter of physiological saline. However, in surgery of the hand, particularly in Dupuytren's contracture, we continue to employ salts of methonium which has a longer period of action. This agent is, of course, less easily controlled, but we have used it in very small doses since the majority of these operations are performed under tourniquet.

In general, five minutes before removal of the tourniquet, twenty-five milligrams of
hexamethonium are injected intravenously, the patient's hand being elevated and the lower extremities and the head being lowered. The blood pressure is followed carefully; the systolic pressure should not fall below eighty. The action of the drug continues for approximately one hour. If it is desirable to prolong the period of ganglionic paralysis during the immediate postoperative period, one may proceed with a second injection, providing that the drop in blood pressure resulting from the first injection had not been excessive. Twenty-five to fifty milligrams are injected by the intramuscular route in the second injection when the blood pressure is starting to rise. The action of the anaesthetic injected by way of the intramuscular route is less marked and more prolonged.

If hypotensive anaesthesia is not employed, then the tourniquet is utilized in the routine fashion to control bleeding during the operation; it is removed while bleeders are controlled, and then is re-applied while the pressure dressing is applied.

SKIN REPAIR

Finally, there is the question of skin repair. We have become more conservative and we try to avoid cutaneous excisions; usually, we are able to close the incision with steel-wire sutures.

Sixteen of our patients have undergone plastic surgery; free grafts have been used in nine and flaps in seven.

All of the plastic procedures have been reserved for advanced cases. On the whole, the results show an improvement, but we have had six cases of partial necrosis (in five after free grafts were used and in one after a flap was used), requiring re-grafting procedures in three and limitation of articular mobility in four cases.

It is now our opinion that the plastic stage can often be avoided, since the skin becomes more elastic following operation. If skin covering is required, we prefer a local flap, taken from the dorsal surface of the hand and carried up to the fifth finger after the method of Bruner, this in preference to free grafts which, despite some good results, have shown too high a percentage of slight necrosis.

It is most important to obtain complete healing as soon as possible. Delayed healing and separation of the sutured edges are factors in subinfection and oedema and hinder the restoration of movements. For this reason, we avoid any procedure which would cause tension on the scar, as well as the use of free grafts, which have given us a much higher incidence of partial necrosis than the preservation of scar-infiltrated skin.

The dressing is an important part of the operation. A large bolus pressure dressing is held in position by sutures in the corners of the palm, the long ends of which are passed over the bulky dressing and tied, as advocated by Mason. The metacarpophalangeal joints are placed in flexion to avoid traction on the palmar incision. An elastic bandage is firmly applied, thus constituting a splint which maintains the hand in the position of function; the interphalangeal joints are left free, so that they may be actively exercised. The hand is elevated, and the patient is kept in the hospital for at least three days. On the eighth day, the dressing is changed. In some cases, we have injected two cubic centimeters of hydrocortone locally, which appears to reduce the scarring. (Treatment of Dupuytren's contracture by injections of hydrocortone alone, instead of by surgery, have given only poor or no results.) The skin sutures are only removed at the end of three weeks. The patient usually returns to work at the end of four or five weeks.

The most important complications are hematomata, oedema, and stiffness of the joints. With careful surgery and meticulous after-care, these may be avoided.

It is possible that etiological factors may be partially responsible for poor results; however, that seems to be too simple an answer in most cases. In our experience, the majority of postoperative complications have been the result of faulty technique or errors of estimation. Possibly in no other type of surgery can such errors so seriously affect functional ability as in the hand.

Recurrences which indicate a developmental tendency of the disease are more difficult
to control. We have observed four* such cases, which were followed from six months to five years, in patients upon whom we had previously operated. In only one case was it necessary to carry out revisionary surgery; in this case, arthrodesis was done in the fifth finger. One should distinguish between the occurrence of nodules at the operative site and their occurrence in other areas of the hand. In two cases, the recurrences were evident in the fingers previously affected, in the fifth finger in one patient and in the fourth in another. The latter patient was an old man who, because of his age, had had only a limited aponeuroctomy. On two occasions, we have seen secondary nodules at the level of the thumb and index fingers which had not been operated upon.

We have operated for relapses in seven patients who had previously been operated upon one or more times elsewhere. Three of these patients had epilepsy (in one of these, we observed the appearance of a new nodule after our re-operation); one patient had a marked periarthritis of the shoulder; one patient had plantar nodules and elastic knuckle pads; and in two patients, the original contracture had been localized in the fifth finger. However, it is unwise to give too much importance to these etiological factors, since fasciectomy may have been incomplete, especially at the level of the fingers.

The presence of fibrous changes elsewhere would perhaps justify an attempt at general therapy directed against the modification of connective tissue; but the use of vitamin E, heparine, or cortisone has given only very irregular results.¹

RESULTS

Removal of palmar fascia in a series of fifty-six hands examined after a variable follow-up period of six months to five years has given the following results: 43 per cent. very good, 34 per cent. good, 20 per cent. fair, and 3 per cent. poor.

Other than the cases considered in these tables, we have also treated, secondarily, ten patients (fourteen hands) who had already been operated upon elsewhere for Dupuytren’s contracture and who presented recurrences or sequelae. The problems in these cases varied. Some patients had only cutaneous sequelae, contractures which had occurred as a result of vertical incisions across transverse creases, for which Z plasties or grafts were performed. Sometimes, the removal of palmar fascia had been correctly performed, but the digital stage had not been included, and it became necessary to complete the excision. Some of these hands had been brought to us in a useless state—with stiff fingers, contracted and oedematous. In these patients, it was necessary to perform arthrodesis.

* Since this was written, nodules have developed at a distance from the site of the original operation in two other patients of this series.

Fig. 11

Showing the dressing. The metacarpophalangeal joints are maintained in flexed position, but the interphalangeal joints are left free to move.
of the fingers in a position of function or to amputate one or more fingers, utilizing the skin flaps as a supply for the palmar skin. Eight of the hands treated for sequelae were considerably improved; six were improved to a lesser degree.

CONCLUSIONS

In a series of 100 cases of Dupuytren's contracture, it has been found that the site of the lesions, the choice of treatment, and the surgical technique constitute the most important factors in prognosis.

Complete removal of palmar fascia, including the palmar and digital lesions, appears to be the most effective treatment for this condition.

Controlled hypotension in conjunction with tourniquet compression has been employed in a series of selected cases.

REFERENCES