

DUPUYTREN'S CONTRACTURE: FIBROMA OF THE PALMAR FASCIA

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THE PROGRESSIVE unilateral or bilateral contracture of the fingers of the ulnar side of the hand, which we know as Dupuytren's contracture, had been described prior to 1832, when the great French surgeon whose name it bears called attention to the fact that the actual shortening occurred in the palmar fascia and did not involve the tendons. This observation has since been universally confirmed and, on this basis, successful surgical treatment has been possible. Despite numerous subsequent attempts to explain the nature of the change in the palmar fascia, no satisfactory theory of etiology has as yet been advanced. It is the purpose of this paper to show that Dupuytren's contracture is due, in a series of cases, to a neoplasm—a cellular fibroma of the palmar fascia.

THEORIES OF ETIOLOGY

Some of the many theories of the nature of Dupuytren's contracture may be mentioned, though many have not received adequate support to warrant discussion here. Abbott,¹ quoting from many sources, mentions the possible contributions of a familial trait; an ulnar nerve lesion; endocrine disturbances; and dental and tonsillar sepsis. There can be no controversy over the fact, repeatedly observed by many writers, that several persons in the same family and in succeeding generations may suffer from the contracture, but this interesting fact actually casts no light on the cause or nature of the disease. The suggestion that there may be a lesion of the ulnar nerve seems to grow out of the predilection of the contracture for the ulnar side of the hand, though rarely, if ever, can such a lesion be demonstrated. The frequent simultaneous occurrence of Dupuytren's contracture and arthritis, together with the difficulty of adequately explaining the cause of either, has led to the suggestion that focal infection, thought by many to be implicated in arthritis, might play a rôle in the contracture as well.

Kanavel, Koch, and Mason² have gathered from the literature five additional suggested causes. These are trauma (Dupuytren himself thought the disease resulted from repeated trauma); local inflammation; lead poisoning; loss of fat with advancing age; and embryonic malformation. They discuss the rôles of trauma, "a constitutional vice like gout or rheumatism," and heredity. In eight out of 29 patients they elicited a definite family history of Dupuytren's contracture. They found that their patients had

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about the same incidence of gout and rheumatism as could be found in a group of comparable ages, not suffering from contracture. Sixteen of their patients gave histories of trauma to the palm to which they attributed their disease. The authors point out that the histories are all unconvincing. They ultimately conclude that the etiology of the contracture is unknown.

Gill,³ and Davis and Finesilver⁴ point out the unlikelihood of trauma as an etiologic agent because (a) the disease usually has a late onset after the completion of the working years, in which trauma to the palms is most likely to be sustained; (b) there are relatively few cases among laborers and many among "white-collar workers" (Kanavel, Koch, and Mason reported 321 cases of which 175 occurred in nonlaborers, while 146 were in laborers); (c) trauma is usually unilateral, while the contracture is often bilateral (313 cases out of 648 reported by Kanavel, Koch, and Mason); and (d) trauma to the palm is much more common than Dupuytren's contracture.

Brooks⁵ has reported a case in which a unilateral Dupuytren's contracture was associated with an aneurysm of the axillary artery, and which almost entirely disappeared following proximal ligation and distal reconstructive endo-aneurysmorrhaphy of the aneurysm.⁶ In this connection, the author recalled as examples of fibrosis associated with impairment of blood supply the contracture of Volkmann, and the scarring of the tissues of the leg distal to varicose veins.

The suggestion that the contracture is due to a neoplasm is rare in the literature. Horak,⁷ histologically, found no actual inflammation, and concluded that the process lay on the borderline between inflammation and new growth. McWilliams⁸ stated that the process was a "chronic hyperplastic inflammation of the palmar fascia and adjacent connective and fatty tissue" involving only certain portions of the tissue at a time and producing the "small tumors felt in the palm."

Ewing,⁹ though he states that the etiology of the contracture is undetermined and does not actually say that it is a neoplasm, implies a recognition of its neoplastic character by discussing it in the chapter on fibromata in his book, "Neoplastic Diseases." The issue is somewhat clouded, however, by the unfortunate fact that the condition is classified under tumors of peripheral nerves in the subgroup "elephantiasis," which also includes inflammatory types. He states: "Hyaline changes are not infrequent and the structure then resembles that of keloid. Occasionally, the structure is more cellular and resembles hyaline neurofibroma, with appearance of somewhat numerous, large polyhedral cells of uncertain origin." Unfortunately, the vagueness of these statements makes it difficult to be sure whether Ewing believed the contracture was neoplastic.

In this connection it is of interest that McWilliams,⁸ Kanavel, Koch, and Mason,² Abbott,¹ Meyerding,¹⁰ and Davis and Finesilver,⁴ all emphasize the fact that the first symptom of contracture is a palpable nodule in the palm.

The material for this study comes from 22 hands of 17 patients operated upon for Dupuytren's contracture in the Johns Hopkins Hospital, and from

whom excised tissue was saved for study. Fifteen cases were in males and two cases in females. The contracture was unilateral in 10 cases and bilateral in seven, but one hand of one patient had previously been operated upon elsewhere, and the specimen from one hand of another is no longer available. In 15 patients the history of onset is available and in eight of these a nodule in the palm was the first thing noticed, even before contracture began. Five patients stated that other members of their families suffered from contractures of the fingers. In only one case was there a history of trauma to the palm, while in three this factor was not touched upon in the history.

The histologic picture of the tissue excised is surprisingly uniform. In 17 hands of 14 patients there are areas of rather cellular fibroma interspersed with areas of hyaline-appearing fascia. Among the five cases with bilaterally operated contractures, from both of whose hands tissue is available, tumor is

TABLE I
FINDINGS IN SEVENTEEN CASES OF DUPUYTREN'S CONTRACTURE

Case No.	Unit No.	Sex	Hands Involved	History of Trauma	Family History	Onset with Nodule	Fibroma Found
1	227601	M	1	0	+	0	+
2	195763	M	1	0	0	0	+
3	187206	M	1	0	0	+	+
4	170333	F	1	0	+	+	+
							0
5	135119	M	1	0	0	0	Skin only
6	57522	M	1	?	0	?	+
7	52836	M	2				0
			1 lost	0	+	+	Subcutaneous tissue only
8	44676	M	1	0	0	+	+
9	36027	M	1	?	0	+	+
10	35603	M	1	?	0	?	+
11	25406	M	2				
			1 operated	0	0	0	+
12	146873	F	1	0	0	+	+
						0	+
13	262778	M	2	0	+	0	+
						0	0
14	30531	M	2	0	0	0	+
						0	0
15	61976	M	2	+	0	0	0
16	38855	M	2	0	0	+	+
						+	+
17	283453	M	2	0	+	+	+
Totals.....		15 male 2 female	22	1	5	8 cases 10 hands	14 cases 17 hands

present bilaterally in three cases, absent bilaterally in one case, and present unilaterally in one. Of the 17 hands which histologically show fibroma, three failed to do so in the original section, and the neoplasm was revealed only on serial section of the blocks of tissue saved. Serial sections were also made from the blocks of the five hands which failed to reveal fibroma, and one of these proved to consist only of skin and subcutaneous tissue, while another was subcutaneous fat only—indicating that in these cases either the operator or the pathologist missed the palmar fascia. The other three negative blocks

show hyaline-appearing fascia identical with that which is interspersed between the areas of tumor in the remaining cases. Since in each case the pathologist imbedded for sectioning only a representative piece of the tissue removed, and since in three cases mentioned above only hyaline fascia was seen until the blocks were sectioned serially, it is possible or even probable that fibroma was actually present in the negative cases also. These data are recorded in Table I.

HISTOLOGY OF TUMORS

The fibromata in these cases are rather poorly demarcated, fading out into the surrounding fascia. They are composed of small, spindle-shaped cells, with elongated nuclei which contain finely granular chromatin particles. The cytoplasm is scanty and poorly outlined. These cells are imbedded in a matrix of fibrous tissue whose wavy pattern is suggestive of normal fascia or tendon. There are suggestions of whorls, and the bundles of cells run in various directions, some lying in the plane of, and some perpendicular to, the plane of any section. No mitoses are seen, and the cells are all quite alike. Inflammatory cells are so rare as to be almost nonexistent. Photomicrographs of representative cases of these tumors, demonstrating these various characteristics, are seen in Figures 1-3, inclusive, while a higher magnification, to indicate the waviness of the stroma, is seen in Figure 4.

These fibromata are histologically almost identical with the benign fascial fibromata seen elsewhere, especially with desmoid tumors of the abdominal wall. Two of these latter tumors are shown in Figures 5 and 6, for comparison. Figure 7 shows another histologically similar fibroma which arose from the fascia of the popliteal space, and Figure 8 is another such tumor which originated in the plantar fascia of the foot. These latter tumors, while they slowly invade the surrounding structures, do not metastasize. Quite obviously, the benignancy of the fibroma seen in Dupuytren's contracture is confirmed by the failure of the literature to record metastasis in any of the many reported cases.

CONCLUSIONS

No real conclusion as to the etiology of Dupuytren's contracture has previously been reached. In general, various suggestions have been made—trauma; familial trait; focal infection; ulnar nerve lesions; endocrinopathy; local inflammation; embryonal malformation; palmar atrophy with advancing age; and lead poisoning, *etc.* None has been generally accepted, and much of the discussion of etiology has been directed toward proving that these are *not* the causes of the contracture.

While to say that a lesion is a neoplasm is admittedly no explanation of its cause, it at least indicates the general type of abnormality with which one has to deal. The present study of tissue removed from 22 hands of 17 patients with Dupuytren's contracture reveals areas of cellular fibroma in the palmar fascia in 17 hands of 14 patients, while the tissue from two hands does not

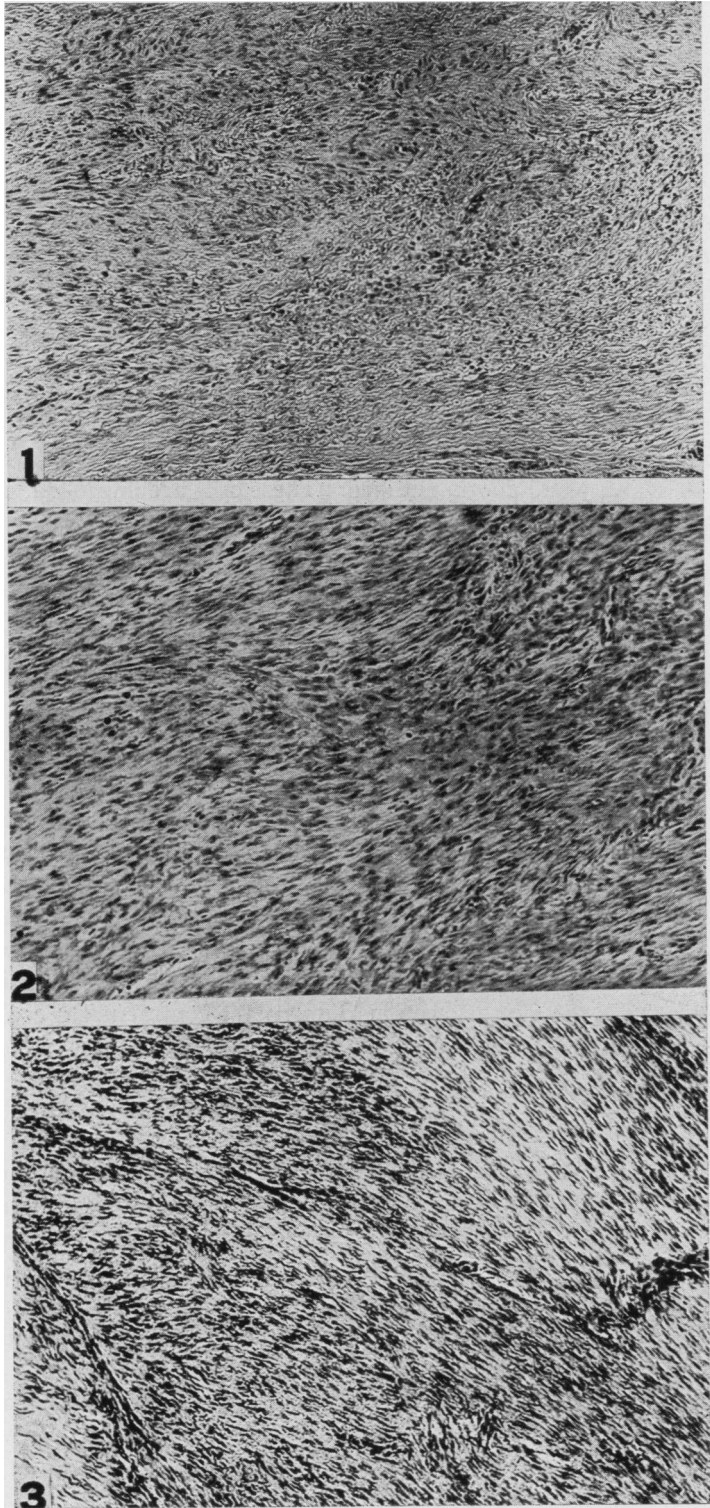


FIG. 1.—Case 1: Fibroma of palmar fascia from Dupuytren's contracture. Tumor is composed of elongated cells in a fibrous matrix. Bundles of fibers and cell nuclei course through tumor in various directions.
FIG. 2.—Case 11: Fibroma of palmar fascia from Dupuytren's contracture.
FIG. 3.—Case 17: Fibroma of palmar fascia from Dupuytren's contracture.

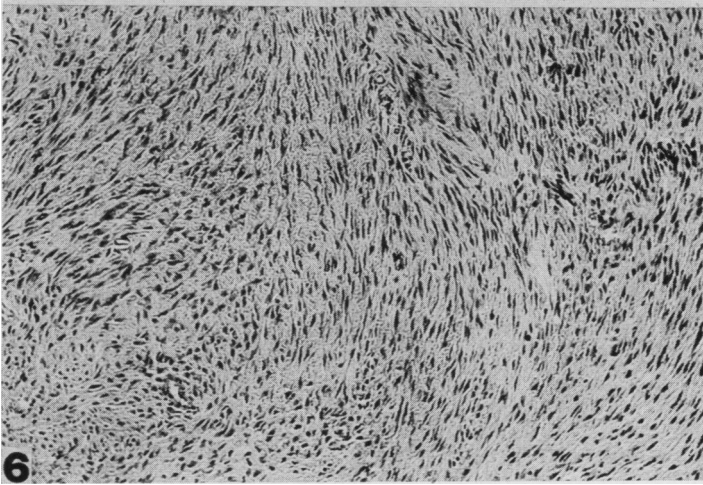
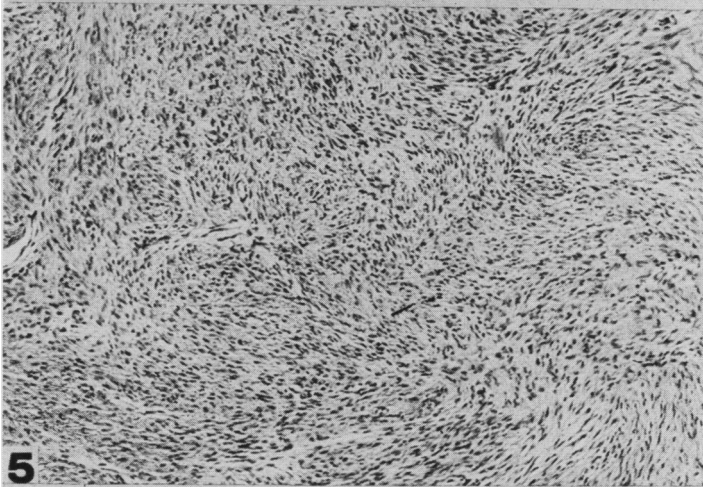
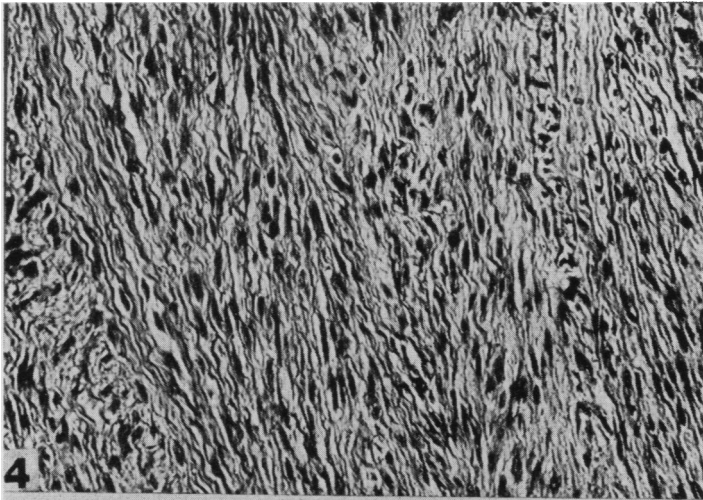


FIG. 4.—High power magnification of fibroma of palmar fascia from Case 11, showing wavy fibrillary pattern of stroma.
FIG. 5.—Fibroma of fascia of abdominal wall (desmoid tumor) from a 25-year-old white male. (Compare with Figures 1-3.)
FIG. 6.—Fibroma of fascia of abdominal wall (desmoid tumor) from a 24-year-old white female. (Compare with Figures 1-3.)

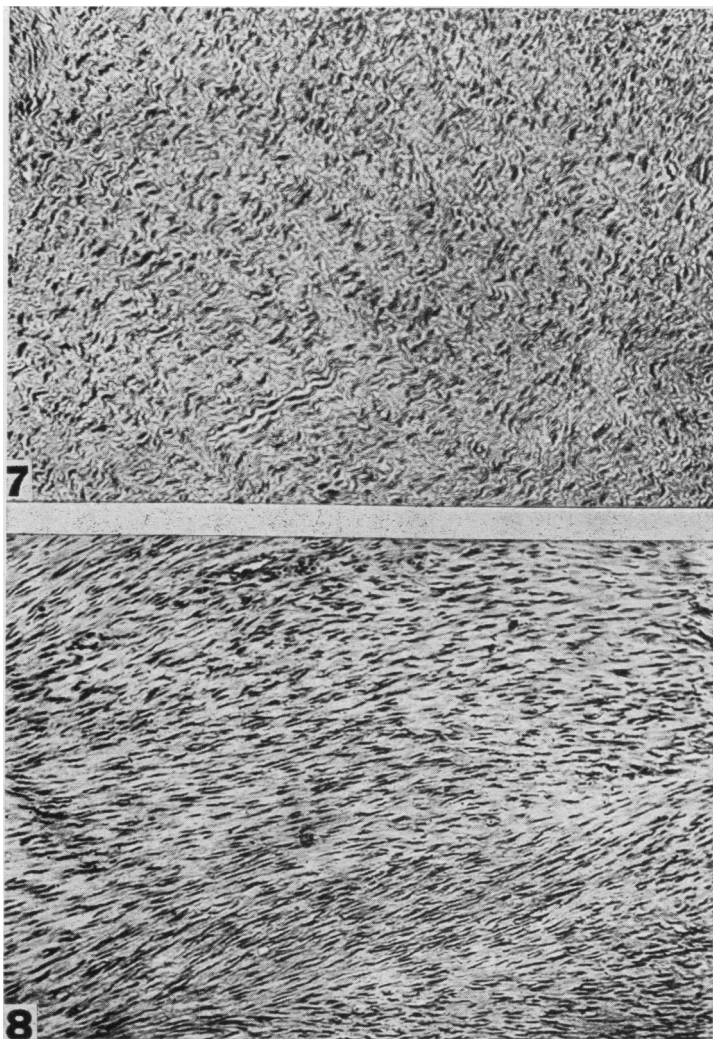


FIG. 7.—Fibroma of fascia of popliteal space from a 23-year-old white female.
(Compare with Figures 1-3.)
FIG. 8.—Fibroma arising in plantar fascia of a 21-year-old white female.
This tumor had been present since childhood and was 2 cm. in diameter.
(Compare with Figures 1-3.)

include the palmar fascia. As has been pointed out, the method employed in preparing the specimens for microscopic examination makes it possible that tumor was present in the palmar fascia of the three remaining hands.

In addition, in eight of the 15 patients in whom a history of onset is available, a palpable nodule in the palm was the first symptom of the disease, even preceding the onset of contraction of the fingers. This is in agreement with the histories, previously quoted by several authors, and seems very significant in the light of the subsequent histologic finding of fibromata.

The predominance of males, 15 of 17 patients, as well as the family history

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of Dupuytren's contracture given by five patients, agrees with previously reported data. It would be of interest to see whether other fascial fibromata, including the desmoid tumors, have a tendency to familial occurrence. This point has generally not been mentioned in the recorded cases, and in one large series^{11, 12} it was not observed. Among 14 patients whose history touches on this point, only one gave any suggestive history of trauma to the palm.

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