THE ETIOLOGY AND PATHOLOGY OF DUPUYTREN'S CONTRACTURE

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THE etiology of Dupuytren's contracture has not been established definitely. In previous publications, one of us (Meyerding 15–18) has reported his clinical, surgical, and postoperative observations. Available tissue removed at operation has been examined microscopically in order to determine the pathological changes. We recognized, as other pathologists have, that the thickened and contracted palmar fascia caused the deformity. The fascia in these cases is characterized by definite proliferation of its fibrous components. A search was made for the factors involved in the production of this proliferation and in adjacent palmar tissues, areas of increased vascularity and lymphocytic infiltration were discovered. Although there is evidence that heredity and trauma may play a rôle, we believe that the inflammatory reaction noted is of prime importance in the etiology of Dupuytren's contracture.

In 1831, Dupuytren gave his first description of what he termed "*retraction permanente des doigts*" (permanent contracture of the fingers), a condition which has subsequently been named after him. Although Dupuytren was not the first to recognize that the palmar fascia was chiefly responsible for the flexion deformities of the fingers, he described the gross pathological changes so clearly and so well that posterity has seen fit to do him honor by giving his name to this clinical entity. He observed from his dissections that the skin of the palm had small, hard knots and wrinkles which disappeared when the skin was dissected from the palmar fascia. The palmar fascia itself was hard and thick, diminished in length, and was under tension. The prolongations from the fascia distally ran to the sides of the proximal phalanges of the fingers. The contracture of these prolongations of the palmar fascia produced flexion of the fingers. Examination of tendons and joints revealed them to be entirely normal.

The descriptions of the microscopic pathology given by the early authors were meager. In 1877, P. Richer dissected the left hand in a case of bilateral Dupuytren's contracture. He stated that the skin was firmly adherent to the underlying fascia, but was scarcely changed microscopically. The superficial fascia was thickened, hard, and shortened owing to an increase in the number and size of the elastic and collagen fibers. He concluded that the palmar fascia was the only structure altered. No signs of inflammation were noted, but he classified the changes as the same as those in chronic articular rheumatism. In 1882, F. Chevrot made a study of the histological changes in Dupuytren's contracture. He noted the thickened palmar fascia and the absence of the normal adipose tissue separating the fascia from the skin. In addition, however, he described a thickening of the epidermis, which he attributed to the protection of the surface epithelium from friction as a result of the contracture. He noted a thickening of the lining of the sweat glands.

Langhans, in 1887, apparently made a thorough pathological study of Dupuytren's contracture for many of his contemporaries and later writers have quoted from his work (3, 4, 9, 10, 13). He is credited with the following observations on the pathogenesis of Dupuytren's contracture: It is an inflammatory and proliferative process which begins in the interstitial connective tissue and in the adventitia of the blood vessels. This process involves the palmar fascia and leads to an increase in the number and thickness of the bands of connective tissue. In the fascia the number of nuclei is increased but they also occur in scattered groups throughout the fat and interstitial con-

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nective tissue. These nuclei are shorter and broader than normal and arise in the adventitia. True inflammatory phenomena, such as emigrations of leucocytes are entirely absent.

Nichols (19), in March, 1899, reported a case in which he observed thickening of the skin, absence of fatty tissue and adherence of the dense, fibrous bands to the skin. Elsewhere the epidermis, dermis, and subcutaneous tissue were normal. He noted an increased proliferation of connective tissue cells in and about the blood vessels; some fasciculi of the fascial bands were composed mainly of cells. The sweat glands were numerous and unchanged. In October, 1899, the same author (20) in another paper reviewed the literature and presented the results of microscopic study in 2 other cases. In the first of these, the palmar fascia was thickened and the process involved the skin. He noted particularly the absence of sweat glands in the involved skin and increased thickness of the stratum corneum. The palmar fascia was made up of dense fasciculi of white fibrous tissue. Toward the wrist this band was acellular and avascular but in other places there was marked proliferation of connective tissue cells and capillaries. In the second case the palmar fascia was merely one dense fibrous band which contained numerous nuclei, but few blood vessels. This writer described the lesion as essentially a hypertrophy of connective tissue. He stated that during an early or developing period the cellular or vascular elements occur in great abundance but at a later stage when the lesion is fully developed and stationary, the cells and vessels diminish leaving the abnormal tissue, a dense mass of connective tissue which is similar to the pre-existing normal palmar fascia.

In 1897, Anderson considered the condition to be inflammatory hyperplasia or neoplastic growth which began in the skin and subcutaneous tissues of the palm and by a process of nuclear proliferation spread along the course of the blood vessels, replacing the adipose tissue and, secondarily, involving the palmar fascia. Ledderhose (13), in 1897, described a similar pathological condition in the plantar fascia, which he termed "plantar fasciitis." In another article on palmar fasciitis in 1920, the same author (14) ascribed Dupuytren's contracture to a chronic proliferative process without inflammation.

In 1902, Janssen studied the microscopic anatomy of the hand in 7 cases and gave a comprehensive description of his observations. He noted the early thickening of the palmar fascia, then the formation of small knots, and finally, the contracture of the fascia and adherence of the skin to the fascia. On microscopic examination he described the process as a proliferation of fibrous tissue from multiple foci which extended down to, and involved, the tendon sheaths. He described the close resemblance microscopically between the cellular fibrous tissue and fibrosarcoma; he even noted the occasional presence of mitotic figures. He concluded, however, that Dupuytren's contracture is not a neoplastic process nor an inflammatory process as there are no signs of inflammation and the lesion is purely a hypertrophic process.

In 1918, Coenen made a complete and detailed review of the literature and concluded that Dupuytren's contracture is chronic inflammation of the superficial palmar aponeurosis with vascularization and proliferation of new cells. He did not report any studies or observations on cases of his own.

In 1920 and 1921, Krogius (11, 12), from observations on his own patients, made a distinction between new and old cases. In the new cases, newly formed connective tissue appeared; in the old cases, the bands were hard, strong, and hyalinized. He ascribed the contracture to the proliferation of embryonic rests of primitive muscles of the palm—the flexores breves manus superficiales.

In 1928, Iklé reviewed the literature and reported his observations in 10 cases. He noted the changes described by previous authors. He concluded that the condition is a thickening of the palmar aponeurosis as the result of the new formation of connective tissue. The cellular part of the newly formed connective tissue often resembles fibrosarcoma. Some investigators, he stated, have noted lymphocytic infiltration, but in his cases this was observed only rarely. He did not believe, therefore, that the condition was inflammatory. He stated that although some portions do re-

semble a neoplasm, the anatomical findings are against it. It is not fibroma because the process is multifocal and diffuse; nor is it sarcoma because local infiltration and metastases do not occur and only a few mitotic figures are present. He proposed to call it a chronic hyperplastic process resulting in fibrosis of the palmar fascia.

More recently, other authors (4, 8, 21) have reviewed the literature, but few have investigated the microscopic pathology and little has been added to the observations of the earlier writers.

There has been great unanimity of opinion regarding the nature of the pathological changes in the palmar fascia. It becomes hard and thickened and presents varying degrees of cellular proliferation. The descriptions of changes in the other tissues of the palm are far from consistent. Some investigators have noted involvement of the skin and subcutaneous tissue; others have not. Many have noted the formation of new connective tissue and blood vessels, but most authors have denied the presence of leucocytes in the affected tissues.

The etiology of Dupuytren's contracture has long been a problem to the medical world. We do not wish to discuss it in detail, but wish merely to point out the relationship of the histological changes to the etiology. Dupuytren himself expressed the belief that local trauma played a large part in the production of contracture of the palmar fascia because, in his experience, it was more common in manual laborers. Contemporary writers associated contracture of the palmar fascia with gout, but at the same time, they confused gout with various forms of arthritis (chronic infectious arthritis, senescent arthritis, and so forth). Many investigators have noted the association of contractures of the fingers with contractures of the palmar fascia following lesions of the central nervous system, such as tabes dorsalis, multiple sclerosis, syringomyelia, and injuries to the spinal cord and also of the peripheral nerves after fractures and other trauma. Heredity has long been known to be an outstanding predisposing factor. Chronic infection has long been a subject of much debate. The chief opposition has been based on the lack of evidence of inflammation in the affected tissue as evidenced by leucocytic infiltration.

HISTOLOGY OF THE NORMAL SKIN OF THE PALM AND FASCIA

Before considering the pathological changes which occur in the palm in Dupuytren's contracture, we shall review briefly the normal histology in order better to compare the pathological changes (Fig. 1). The normal skin of the palm has a similar structure to skin of other parts of the body. It differs in certain respects in that it contains no hair follicles or sebaceous glands and deep in the subcutaneous tissue there is a dense layer of fascia, the palmar fascia.

The skin consists of three main layers: the epidermis, the dermis, and the subcutaneous tissue. The epidermis is made up of stratified epithelium in various stages of its growth as the cells grow from the basal layer outward through the prickle-cell stage, then become keratinized, and finally are shed as dead scaly epithelium.

The dermis, or corium, is that portion of the skin which lies immediately beneath the epidermis and carries the nerves and blood vessels which supply the skin. The dermis is made up of two strata, a deeper reticular layer and a superficial papillary layer. The surface of the papillary layer presents numerous conical elevations, the papillae of the corium which project into the under surface of the epidermis. These papillae are abundant in the palm. They consist of a fine supporting network of connective tissue for the finer branches of the cutaneous blood vessels and nerves. A few wandering cells and lymphocytes may be seen particularly just beneath the basal layer of the epidermis. The deeper portion of the corium consists of interlacing bundles of connective tissue fibers which form a moderately loose network. These bundles are much coarser than those of the papillary layer and seem to pursue a wavy or spiral course. This loose regular arrangement of collagen bundles gives to the reticular layer the appearance of having been braided or woven. It is this loose elastic structure of the derma which allows the skin to stretch and bend with every movement of the hand. The reticular layer contains the

larger blood vessels of the corium and many small nerve trunks. The secreting portion of many of the sweat glands lies in the deeper portion of the reticular layer; most of these glands, however, lie in the superficial layers of the subcutaneous tissue.

The subcutaneous tissue consists of a coarse network of narrow strands of connective tissue, which pass between the reticular layer and the palmar fascia. The meshes of this network are occupied by lobules of adipose tissue. The palmar fascia consists of a thin layer of dense connective tissue. The collagen fibers are straight and are packed close together in parallel bundles. The fascial bands form a sheath of tissue parallel to the surface of the skin and are connected to the skin superficially and to the deeper structures by thin strands of dense, strong connective tissue. The nuclei in the connective tissue of the fascia are few, very small and elongated as they lie between the collagen fibers.

Connecting and filling the spaces between the various layers of the skin, subcutaneous tissue and fascia is a very loose network of connective tissue made up of loose bundles of wavy collagen fibers. It forms the supporting tissue for the blood vessels and nerves as they lie deep to the palmar fascia. The few nuclei of the connective tissue in this interstitial tissue are small and stellate. Only an occasional wandering cell is seen in the normal connective tissue.

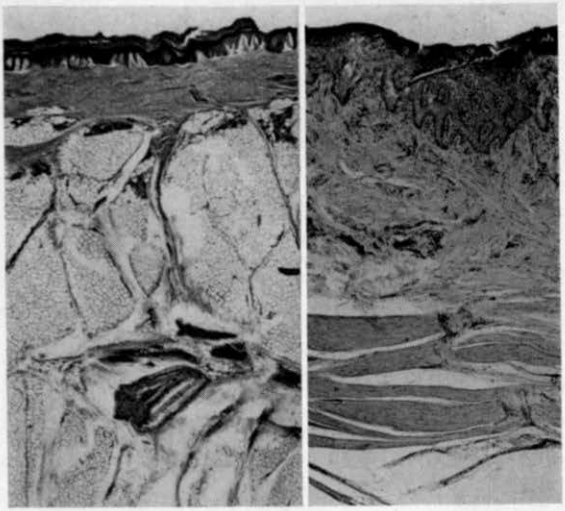

Fig. 1, left. Normal skin showing the various layers including the palmar fascia. ×11.

Fig. 2. Skin in Dupuytren's contracture showing thickening of the epidermis with hyperplasia of all the zones. ×21. The normal structure of the corium is completely changed, the papillary layer is distorted and there is a marked perivascular lymphocytic infiltration in all layers; this is most marked in the papillary zone. The regular pattern of the reticular layer is completely disrupted. The subcutaneous tissue has disappeared and the palmar fascia is adherent to the deeper layers of the skin. Sweat glands are entirely absent.

MATERIAL STUDIED

In 1936, one of us (Meyerding, 16) reported observations made on 448 hands of 273 patients with Dupuytren's contracture. Eighty-four, 31 per cent, of the patients were subjected to operation. The material studied in the present investigation consisted of the available specimens removed at operation in this series of cases as well as others obtained since 1935. Specimens from 57 cases were studied; the cases were encountered in the period from January, 1913, to July, 1938 inclusive. These specimens, in the main, consisted of the contracted palmar fascia, in many cases, the entire fascia; in others, just the contracted bands. In some cases, the overlying skin was removed still attached to the fascia; in many specimens in which all the layers of the skin were lacking, the deeper layers of the skin were present and in these the sweat glands and other structures could be studied. Many of the studies made in the past were incomplete because the specimens available were only small fragments of contracted fascia. Some authors, it is true, studied the entire hand at necropsy, but the number of such cases is small. On the whole, the specimens studied in our series probably represent more complete samples of the palmar fascia and neighboring tissues than those studied by early pathologists. This fact may account for the failure of these men to observe some of the tissue changes which will be described by us in the following paragraphs.

The tissues were fixed in 10 per cent formalin, sectioned with the freezing microtome, and stained with hematoxylin and eosin. Sections were taken from various places on the tissue removed from each patient, in order to select the most characteristic. That is, cross sections and longitudinal sections were made through the fascia and skin including any of the nod-

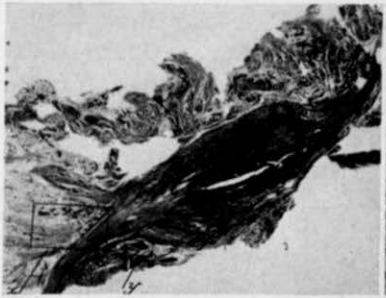

Fig. 3.

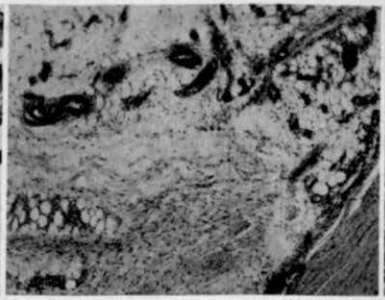

Fig. 4.

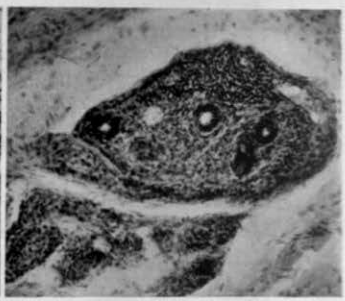

Fig. 5.

Fig. 3. Thickened palmar fascia and adherent tissue. ×5. The fascia shows proliferation grade 2 of new connective tissue cells. Surrounding tissue shows marked fibrosis, new capillaries and perivascular lymphocytic infiltration which is replacing the fatty tissue. Note areas marked *X* and *Y* which are shown in detail in Figures 4 and 5.

Fig. 4. Chronic inflammatory tissue replacement of fat. ×87.5. This photomicrograph represents the area marked *X* in Figure 3.

Fig. 5. Partial destruction of sweat glands and invasion by lymphocytes, ×87.5; tissue from area marked *Y* in Figure 3.

ules that were present. It was often impossible to distinguish in the gross specimen the digital from the carpal fascia.

PATHOLOGICAL FEATURES

The descriptions of the pathological changes in Dupuytren's contracture, even from the earliest times, have emphasized the fibrosis and contracture of the palmar fascia. The changes which were observed in the skin and subcutaneous tissue were regarded as secondary to the contracture of the fascia. Certainly the gross deformity and chief manifestations of the disease are due to contracture of palmar fibrous tissue of which the palmar fascia is the chief constituent.

It is difficult to determine in which tissue or tissues the primary effect takes place, because it is only rarely that tissue is obtained in a very early stage of the disease. Recently, after the present review had been completed, a patient was seen with bilateral plantar fasciitis, the analogue of Dupuytren's contracture in the foot. In this case, the plantar fascia presented all the appearances of normal fascia, microscopically. The collagen fibers were closely packed in parallel bundles and were hyalinized. The cells in the connective tissue of the fascia were mature, small, flattened, and squeezed in between the fibers of the fascia. However, in the loose connective and adipose tissue between and around the fascial bundles were numerous new capillaries; each of which was surrounded by a large number of lymphocytes. A specimen of skin was not obtained, but clinically it was unchanged. In early cases of Dupuytren's contracture, however, the palmar fascia is tightened but even before any contracture takes place the skin becomes thickened and puckered. It is bound down to the underlying tissue and is no longer freely movable. In most instances, we observed that our sections revealed involvement of both the adipose tissue and the palmar fascia. In all cases in which the overlying skin was available for study, definite pathological changes were noted in it. It is probable, therefore, that the disease begins in the interstitial connective tissue and usually spreads to involve all the tissues of the palm down to the deep structures, tendon sheaths, nerves, and blood vessels.

It is a peculiar fact that the disease process should affect the ulnar aspect of the palm more than any other portion. Although the skin, subcutaneous tissue, and palmar fascia are affected, yet in any one case only portions of the skin or other tissues are involved. Certainly the skin over the thenar eminence and proximal portion of the palm usually is not affected and this also applies to the subcutaneous tissue and palmar fascia.

In 10 cases, portions of skin in the region overlying the contracture were available for study. In others, although the outer layers were absent, frequently the deeper layers of the corium were adherent to the contracted tissue. The layers chiefly affected were the

reticular and papillary zones of the corium and in all the available cases an increase in the number and density of the connective tissue fibers was noted (Fig. 2). The reticular zone loses its regular arrangement and loosely woven structure. The fibers, normally running parallel to the surface, become dense masses of connective tissue running in every direction. This accounts for the clinical loss of elasticity of the skin. The papillae of the skin are also changed and become irregular. There is hypertrophy of the epidermis with marked proliferation of all the layers. Numerous new capillaries are seen in the corium surrounded by small groups of lymphocytes. The number of lymphocytes increases in the papillary layer of the corium just beneath the basal layer of the epidermis.

In normal skin the line of demarcation between the dermis and subcutaneous tissue is clearly defined. In this region are found the secreting portions of the sweat glands. In advanced cases of Dupuytren's contracture evidence of subcutaneous adipose tissue is not revealed (Fig. 2) and sweat glands are rare or completely absent. Dense parallel strands of fascia lie just beneath and closely adherent to the reticular layer of the dermis. In less advanced cases (Figs. 3 and 4) the sweat glands are surrounded by fibrous tissue and numerous lymphocytes; the latter are also seen between the acinar lobules of the gland itself (Fig. 5).

The deeper layers of the subcutaneous tissue show an increase in the size and number of the connective tissue bands which normally separate the lobules of fat. There is an increase in the number of capillaries in the interstitial connective tissue and the capillaries are surrounded by lymphocytes. The more advanced the disease the greater is the degree of fibrosis. Infiltration seems to precede the fibrosis (Figs. 3, 4, and 5) since the new capillaries and lymphocytes are more numerous about the still unchanged fat cells. The fat appears to be absorbed or destroyed by this process; then new connective tissue forms and obliterates the capillaries and the lymphocytes also disappear. The palmar fascia is separated from the nerves and vessels to the fingers by a layer of adipose tissue. This fatty tissue may also be involved and the thickened and scarred fascia is closely adherent to the deeper structures. For this reason, nerves and blood vessels were occasionally found embedded in the contracted fascia

In 24 of the 57 cases, there was definite lymphocytic infiltration of the skin or subcutaneous tissue; only occasionally were plasma cells or polymorphonuclear leucocytes noted. The lymphocyctes were commonly found around the sweat glands, blood vessels, and fat cells. The other components of this process, new connective tissue and capillaries were noted in various degrees in most cases and on this basis each case was graded according to the activity of this process.

The palmar fascia gives a picture entirely different from that described in the other tissues, but the changes in this structure are the ones that have been commonly described as characteristic of Dupuytren's contracture. Proliferation of new capillaries and perivascular infiltration of lymphocytes are almost entirely lacking in the palmar fascia itself. Only occasionally are new capillaries seen and in no instance were lymphocytes seen in the fascia. The characteristic change is the proliferation of fibroblasts in the nodules of the contracture. These fibroblasts are round, oval, or spindle-shaped with pale staining nuclei and tend to grow in masses with their long axis, parallel to one another. In very cellular areas (Figs. 6, 7, 8, 9, and 10) where the nuclei are closely packed, many mitotic figures may be seen. In this tissue all stages can be demonstrated from those just described to that in which the collagen fibers lie packed together so tightly that the thin, flattened nuclei can scarcely be distinguished (Fig. 11); the fibers in such portions of the fascia are frequently hyalinized. The marked cellular proliferation is usually seen in the thickened areas of the fascia which correspond to the base of the fingers in the palm. As new fibrous tissue is deposited and contracts, the fibrous connective tissue cells become mature and flattened, forming streaks through the fascia as shown in Figure 9.

We have assumed that the cellular nature of the fascia described indicates the activity of the proliferative process and, therefore, the degree of maturity of the connective tissue was graded on a basis of 1 to 4. The least ma-

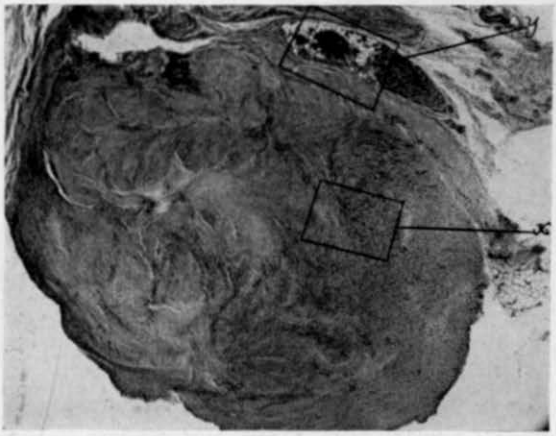

Fig. 6. Nodule from Dupuytren's contracture. ×18.5. Maturity of connective tissue of palmar fascia is grade 2; there is marked cellularity but the cells are smaller and there are more intercellular fibers than in grade 1. Note partially destroyed fat lobules. Area marked *X* is shown under high-power magnification in Figure 7; from *c* in Figure 8.

ture process in which the tissue was very cellular was graded 1 (Fig. 12); the most mature, in which the nuclei were very small and very few in number when compared to the collagen fibers, was graded 4 (Fig. 11). Intermediate degrees were graded 2 (Figs. 6 and 7) and 3 (Fig. 13).

A specimen of palmar fascia was removed surgically from 63 hands belonging to 57 patients. Sixty-one specimens were studied; the maturity of connective tissue was graded and the degree of the inflammatory reaction was estimated. In all cases the degree of inflammatory reaction was mild. The maturity of connective tissue was grade 1 in 9 cases, grade 2 in 19 cases, grade 3 in 15 cases and grade 4 in 18 cases. The cases studied in this group, therefore, tended to have a mature degree of connective tissue. When the relationship of the duration of the contracture to the degree of maturity of the connective tissue was considered, in the cases of longer duration the degree of maturity tended to be greater but there was a wide variation in individual cases. Little relationship was noted between the age of the patient and the grade of maturity of the fascia. The degree of contracture seems to depend more on the duration of the process than on the grade of maturity. No definite correlation was found between the degree of contracture and grade of maturity of fascia.

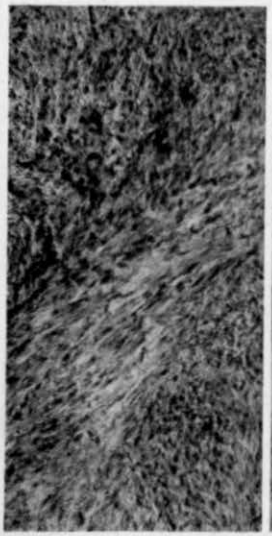

Fig. 7.

Fig. 8.

Fig. 9.

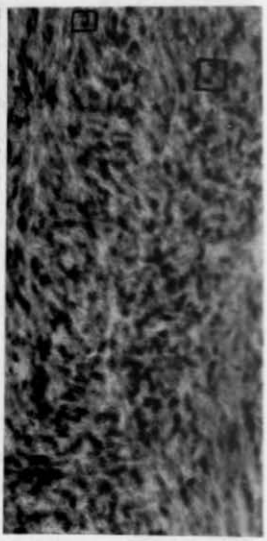

Fig. 10.

Fig. 7. Fascia from area marked *X* in Figure 6. ×105. Note the lack of blood vessels; numerous fibroblasts with oval and spindle-shaped nuclei.

Fig. 8. Fat lobule showing blood vessels and large number of lymphocytes replacing fat cells, ×123; high-power magnification of tissue marked *Y* in Figure 6.

Fig. 9. Fascia with central nodule of very cellular connective tissue, ×20; there are also streaks of older nuclei throughout. Area marked *X* is shown under higher magnification in Figure 10.

Fig. 10. Cellular nature of tissue from *X* in Figure 9. Note mitotic figures. ×175.

Recurrence of contracture occurred in 9 cases and when the tissue from these cases was studied it was found that the average grade of maturity for the group was 1 to 2. This represents a much less mature type of connective tissue than in the series as a whole and indicates a more active tissue. On the other hand, a significant increase in the degree of activity of inflammatory changes was not noted.

Occasionally patients with Dupuytren's contracture complain of soreness and tenderness of the affected region although the usual complaints are thickening of the palm, "callus" contracture of a finger or a prickling sensation. It was thought that in cases in which soreness and tenderness of the palm were present greater degrees of inflammatory activity would be found than in other cases. Our studies, however, did not bear this out.

COMPARISON OF CLINICAL BEHAVIOR AND PATHOLOGICAL PICTURE

The estimation of the inflammatory reaction and the activity of the proliferation of connective tissue in the fascia, which did not necessarily parallel one another, enabled us to compare the clinical behavior with the pathological picture. One particular conception of Dupuytren's contracture interested us particularly and that was the relationship of the so-called green and mature stages to the prognosis. Our studies bear out the idea that there are various degrees of activity in the process and, in the recurrences noted, the fascia tended to be immature. The number of cases of recurrence studied is too small, however, to state conclusively that in cases in which histological examination reveals a low grade maturity of the fascia recurrence is more likely to occur than in those in which higher grades of maturity are found. In the majority of our cases contractures were well established for they had been present for several years; microscopic examination disclosed in most cases a mature type of connective tissue. Therefore if our theory is correct, it would be natural to assume recurrences to be few in this series.

SUMMARY AND CONCLUSIONS

In the past, other investigators have focused their attention on the palmar fascia to the exclusion of the surrounding tissue and have not described the signs of inflammation, proliferation of capillaries and fibroblasts with marked perivascular lymphocytic infiltration. This inflammatory reaction affects chiefly the skin, subcutaneous tissue, and interstitial connective tissue. The palmar fascia is remarkable for the fact that within its fibers there is evidence of an active proliferation of fibroblasts without other signs of inflammation. The process progresses through the cycle of fibroblastic proliferation, and then deposition of collagen fibers which contract and compress the fibroblasts and the final picture of avascular scar tissue result.

This study further demonstrates the fact that Dupuytren's contracture is not merely a disease of the palmar fascia, but involves all structures from the skin down to the tendon sheaths. It is difficult, therefore, to see how

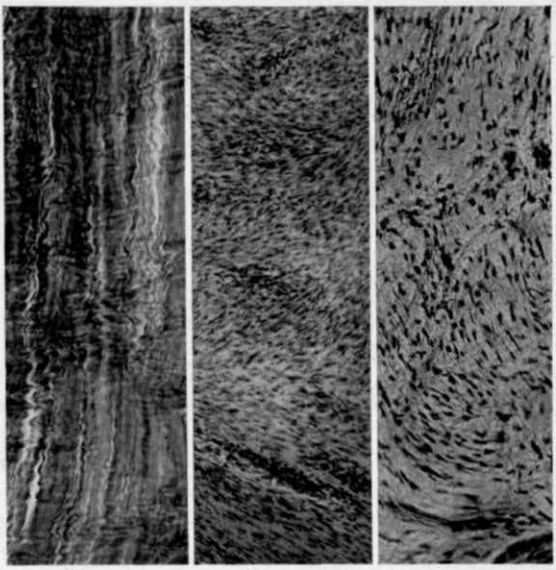

Fig. 11. Fig. 12. Fig. 13.

Fig. 11. Palmar fascia; the maturity of the connective tissue is grade 4. ×130. Hyalinized fascia. The fibers lie closely packed in parallel bundles; the nuclei can scarcely be distinguished. They are few in number, flattened and very small.

Fig. 12. Palmar fascia; maturity of connective tissue is grade 1, ×67; very cellular fascia with few intercellular collagen fibers. Figures 6 and 7 in which the maturity of the connective tissue is grade 2 should be noted, too.

Fig. 13. Palmar fascia; maturity of connective tissue is grade 3. ×130. Nuclei are smaller and flatter than in Figures 6, 7, and 12 in which the maturity of the connective tissue is graded 2. There is a large amount of intercellular collagen.

subcutaneous tenotomy could give consistently good results. On the other hand excision of the mass of scar tissue requires a high degree of surgical skill as emphasized by one of us in a previous paper (17). In cases in which the excised tissue gives evidence of active inflammatory reaction or immature fibrous tissue in the fascia, we believe the likelihood of recurrence is greater.

From the point of view of pathological diagnosis, we wish to point out the danger of confusing Dupuytren's contracture, a benign process, with fibrosarcoma. Errors in such a diagnosis have in the past given rise to tragic results. Although certain portions of the tissue removed for Dupuytren's contracture, do resemble fibrosarcoma on superficial examination and may even contain numerous mitotic figures, there are many points of difference. Dupuytren's contracture is a diffuse multifocal process; the sarcoma-like areas are located in the palmar fascia at the site of the nodules which are so characteristic of the disease. Surrounding these nodules is dense fibrous tissue. The nuclei are pale-staining and regular in shape and size. Local infiltration by these young cells and metastasis do not occur, all of which points are against a malignant lesion.

We have studied the microscopic sections of the palmar fascia in 57 cases of Dupuytren's contracture, and we have formed the opinion that the pathological picture is best explained on the basis of a chronic inflammatory process.

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