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THICKENING AND CONTRACTION OF THE PALMAR FASCIA (DUPUYTREN'S CONTRACTURE) ASSOCIATED WITH ALCOHOLISM AND HEPATIC CIRRHOSIS*

STANLEY J. WOLFE, M.D.,† WILLIAM H. J. SUMMERSKILL, D.M., M.R.C.P.,‡ AND
CHARLES S. DAVIDSON, M.D.§

BOSTON

BARON Guillaume Dupuytren,¹ in 1832, attributed the hand deformity that now bears his name to retraction of the palmar aponeurosis, and an extensive literature has since appeared concerning its etiology, pathogenesis and treatment. In a detailed review, Skoog² mentioned as possible causes or concomitants of Dupuytren's contracture heredity, trauma, neuropathy, rheumatic diseases, endocrinopathy, epilepsy, developmental abnormalities, contraction of the palmaris-longus muscle, local infection, tuberculosis, chronic intoxication (lead) and others. None have been universally accepted or proved.

The deformity is quite common; it is said to occur as frequently in nonmanual workers as in those who labor with their hands,³ and its prevalence in various hospital populations has ranged from 1 per cent to 14 per cent.^{2,4,5}

For several years the group at the Thorndike Memorial Laboratory studying diseases of the liver has observed Dupuytren's contracture with what seemed to be unusual frequency in patients with cirrhosis of the liver, most of whom were chronic alcoholics. To confirm this impression, a survey has been undertaken of the prevalence of Dupuytren's contracture among patients with liver disease seen in this hospital and compared with two groups without liver disease: alcoholic patients and nondrinkers.

SELECTION OF SUBJECTS

Liver Disease

Sixty-six patients (42 males and 24 females) seen consecutively in consultation on the medical wards

*From the Thorndike Memorial Laboratory and the Second and Fourth (Harvard) Medical Services, Boston City Hospital, and the Department of Medicine, Harvard Medical School.

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†Research fellow, Harvard Medical School; postdoctoral fellow of the National Heart Institute.

‡Fellow in medicine, Harvard Medical School; Rockefeller Travelling Fellow of the Medical Research Council of Great Britain.

§Associate professor of medicine, Harvard Medical School; associate director, Second and Fourth (Harvard) Medical Services, Boston City Hospital.

and in the outpatient clinics of the Boston City Hospital were examined for evidence of Dupuytren's contracture. All had unequivocal signs of hepatic cirrhosis and deranged liver-function tests. Liver biopsies or post-mortem examinations were available in 26 patients. Fifty-seven patients (35 males and 22 females) gave definite histories of chronic alcoholism of five to thirty years' duration and had no other demonstrable cause for chronic liver disease. Nine patients (7 males and 2 females) suffered from cirrhosis of the liver not related to chronic alcoholism (hemochromatosis in 4, Wilson's disease in 1 and unknown etiology in 3). No patient was admitted to the hospital for treatment of Dupuytren's contracture.

Chronic Alcoholism without Evidence of Liver Disease

Fifty-five patients with chronic alcoholism (49 males and 6 females) but without physical or biochemical signs of liver disease were examined for Dupuytren's contracture. Forty-seven (42 males and 5 females) were examined while undergoing rest and rehabilitation at the Long Island Hospital,¶ a division of the Boston City Hospital. The remainder were patients on the wards at Boston City Hospital and were admitted for the treatment of delirium tremens or Wernicke's encephalopathy.

Control Group

Fifty-three patients (34 males and 19 females) were examined on the wards at Boston City Hospital. They had no clinical evidence of hepatic disease, admitted on direct questioning drinking alcoholic beverages rarely or not at all and were selected to serve as a "control" group.

Dupuytren's Contracture in Chronic Alcoholism with Cirrhosis

In a review of the files of the Thorndike Memorial Laboratory 288 records (218 male and 70 female

¶Through the courtesy of Dr. John Andosea, medical director, Long Island Hospital.

patients) were found containing data indicating that the patients were chronic alcoholics and had cirrhosis of the liver. In 158 records of patients (118 males and 40 females) seen in the past ten years, the presence or absence of Dupuytren's contracture was reported. The prevalence of the deformity was enumerated.

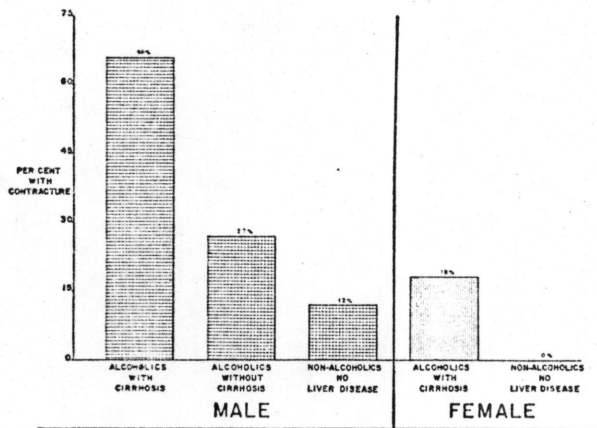


FIGURE 1. Incidence of Dupuytren's Contracture.

ASSESSMENT OF DEFORMITY

Three grades of hand deformity were recognized as degrees of Dupuytren's contracture^{2,7}:

Grade 1. Thickened bands of fascia extending to the phalanges, with definite nodules and frequently associated with wrinkling of the skin secondary to attachment to the underlying fascia.

TABLE 1. Prevalence and Severity of Dupuytren's Contracture in Alcoholic Patients with Cirrhosis of the Liver.

GROUP	NO. OF PATIENTS	GRADE 3 CASES	GRADE 2 CASES	GRADE 1 CASES	TOTAL PATIENTS WITH CONTRACTURE
Males	35	6	4	13	23(66%)
Females	22	0	1	3	4(18%)
Totals	57	6	5	16	27(47%)

Grade 2. The signs described above in combination with fascial shortening and restricted phalangeal extension.

Grade 3. Gross flexion deformities of the fingers due to extreme contraction and shortening of the palmar fascia.

Unless associated with nodules, simple thickening of the bands of the palmar fascia was not considered to be Dupuytren's contracture.

No attempt was made to establish the presence or absence of certain abnormalities said to be related to Dupuytren's contracture: Peyronie's disease, knuckle pads and involvement of plantar fascia. Age, sex, occupation, dominant handedness and duration and amount of alcohol ingestion of the patients were

recorded, and no clear differences were observed in relevant groups.

RESULTS

Figure 1 demonstrates the findings in the three groups personally examined by us.

Twenty-seven (47 per cent) of 57 chronic alcoholics with cirrhosis of the liver were found to have Dupuytren's contracture (Table 1). Twenty-three (66 per cent) of 35 males had alterations in the palmar fascia ranging from thickening and nodularity in 13 to fixed contractures of the fingers in 6. Of 22 females in this category, 4 (18 per cent) showed characteristic changes. Among the male patients with deformity, 9 had bilateral involvement, and 7 were

TABLE 2. Prevalence and Severity of Dupuytren's Contracture in Nondrinkers without Liver Disease.

GROUP	NO. OF PATIENTS	GRADE 3 CASES	GRADE 2 CASES	GRADE 1 CASES	TOTAL PATIENTS WITH CONTRACTURE
Males	34	1	0	3	4(12%)
Females	19	0	0	0	0(0%)
Totals	53	1	0	3	4(8%)

afflicted in the right and 7 in the left hand only. None of the females had changes bilaterally, and the right and left hands were each affected in 2 cases.

The control group of 53 hospital patients (non-alcoholic patients without liver disease) contained only 4 (8 per cent) with definite changes in the palmar fascia. None of the 19 females was affected, whereas all 4 of the cases, or 12 per cent, came from the group of 34 males (Table 2).

The group including 49 male patients with chronic alcoholism but without evidence of liver disease con-

TABLE 3. Prevalence and Severity of Dupuytren's Contracture in Patients with Chronic Alcoholism without Liver Disease.

GROUP	NO. OF PATIENTS	GRADE 3 CASES	GRADE 2 CASES	GRADE 1 CASES	TOTAL PATIENTS WITH CONTRACTURE
Males	49	1	1	11	13(27%)
Females	6	0	0	3	3(50%)
Totals	55	1	1	14	16(29%)

tained 13 cases (27 per cent) with Dupuytren's contracture (Table 3). Five patients had bilateral involvement; 5 involved the right hand only, and 3 the left hand only. Three of 6 females in this group had Dupuytren's contracture.

The results of a survey of Thorndike Memorial Laboratory records of patients with chronic alcoholism and hepatic cirrhosis are shown in Table 4. Forty-nine (42 per cent) of 118 males and 7 (18 per

cent) of 40 females were said to have Dupuytren's contracture.

The ages of patients and mean age (Table 5) were comparable in all groups, and the prevalence of Dupuytren's contracture according to age is shown in

TABLE 4. *Prevalence of Dupuytren's Contracture in Alcoholic Patients with Cirrhosis of the Liver Taken from Files of the Thorndike Memorial Laboratory (1946-1954, Inclusive).*

GROUP	NO. OF PATIENTS	TOTAL PATIENTS WITH CONTRACTURE
Males	118	49(42%)
Females	40	7(18%)
Totals	158	56(35%)

Figure 2. In all except the control group the prevalence of Dupuytren's contracture increased with advancing years, and occurred more frequently in alcoholic patients with cirrhosis than in the other groups, especially in the earlier decades.

Nine patients were seen in whom cirrhosis appeared to be unrelated to chronic alcoholism. Two males

veloped. He considered Dupuytren's contracture, cirrhosis of the liver and polyarthritis as components, together with lupus, of a condition that he termed lymphogranulomatosis metascrophulosa. However, this indirect association between Dupuytren's contracture and cirrhosis was unsupported by examples of cases in which both appeared.

It is of interest that Dupuytren's first patient operated on was a wine merchant who gave a history of noting a crackling sensation in the palm of his hand while lifting a heavy cask. Dupuytren concluded that his patient's deformity was a result of repeated trauma to the palm of the hand, a concept that has survived to this day. Moreover, brewery workers are said to be extraordinarily prone to Dupuytren's contracture. Lund⁷ found Dupuytren's contracture in 21 per cent of 1021 brewery workers. Graubard⁸ discussed 329 patients with Dupuytren's contracture appearing before the New York State Workmen's Compensation Board, 292 of whom were brewery workers, usually of German or Irish stock. It was inferred that the influence of heredity compounded by constant trauma to the hands in handling of heavy beer casks resulted

TABLE 5. *Occurrence of Dupuytren's Contracture According to Age in Decades.*

GROUP	MALE PATIENTS 40 YR. OF AGE OR UNDER		FEMALE PATIENTS 40 YR. OF AGE OR UNDER		MALE PATIENTS 41-50 YR. OF AGE		FEMALE PATIENTS 41-50 YR. OF AGE		MALE PATIENTS 51-60 YR. OF AGE	
	ALL PA- TIENTS	PATIENTS WITH DUPUY- TREN'S CONTRAC- TURE	ALL PA- TIENTS	PATIENTS WITH DUPUY- TREN'S CONTRAC- TURE	ALL PA- TIENTS	PATIENTS WITH DUPUY- TREN'S CONTRAC- TURE	ALL PA- TIENTS	PATIENTS WITH DUPUY- TREN'S CONTRAC- TURE	ALL PA- TIENTS	PATIENTS WITH DUPUY- TREN'S CONTRAC- TURE
Alcoholic patients with cirrhosis of liver	4	2(50%)	5	0(0%)	12	6(50%)	8	2(25%)	10	7(70%)
Nondrinkers with no liver disease	7	0(0%)	2	0(0%)	5	0(0%)	4	0(0%)	11	3(27%)
Alcoholic patients without cirrhosis	11	1(9%)	0	0(0%)	20	5(25%)	1	0(0%)	14	5(36%)
Alcoholic patients with cirrhosis*	25	8(32%)	11	0(0%)	36	11(31%)	11	0(0%)	33	15(45%)
Totals	47	11(23%)	18	0(0%)	73	22(30%)	24	2(8%)	68	30(44%)

*Thorndike Memorial Laboratory files.

with hemochromatosis, 1 of whom also had chronic alcoholism, had Dupuytren's contracture.

DISCUSSION

The association of Dupuytren's contracture with alcoholism and portal cirrhosis of the liver has never, to our knowledge, received more than passing mention in the literature. Skoog² commented on a case of Tamplin in which the use of alcohol was emphasized. The cords of the palms of the hand were said to disappear when the patient ceased to drink wine and beer, but reappeared when he drank to excess and disappeared again during a new period of abstinence. Schaumann⁶ discussed 2 patients with lupus erythematosus in whom Dupuytren's contracture de-

veloped. He considered Dupuytren's contracture, cirrhosis of the liver and polyarthritis as components, together with lupus, of a condition that he termed lymphogranulomatosis metascrophulosa. However, this indirect association between Dupuytren's contracture and cirrhosis was unsupported by examples of cases in which both appeared.

It is of interest that Dupuytren's first patient operated on was a wine merchant who gave a history of noting a crackling sensation in the palm of his hand while lifting a heavy cask. Dupuytren concluded that his patient's deformity was a result of repeated trauma to the palm of the hand, a concept that has survived to this day. Moreover, brewery workers are said to be extraordinarily prone to Dupuytren's contracture. Lund⁷ found Dupuytren's contracture in 21 per cent of 1021 brewery workers. Graubard⁸ discussed 329 patients with Dupuytren's contracture appearing before the New York State Workmen's Compensation Board, 292 of whom were brewery workers, usually of German or Irish stock. It was inferred that the influence of heredity compounded by constant trauma to the hands in handling of heavy beer casks resulted

in the development of Dupuytren's contracture. Hereditary factors have been conceded to be of some importance in the tendency to Dupuytren's contracture,^{2,7} but trauma has been generally discarded because of anatomic and statistical considerations.^{2,4,9} The incidence of alcoholism and cirrhosis of the liver among brewery workers is unknown, but one might speculate that the contents of the casks, rather than their handling, are responsible for Dupuytren's contracture in these people.

The literature on vitamin E provides another area where cirrhosis of the liver and Dupuytren's contracture have a suggestive relation. Steinberg,¹¹ in reporting the finding of low blood tocopherol levels in patients with Dupuytren's contracture and the successful treatment of Dupuytren's contracture by vitamin

E administration, noted that 2 patients with the lowest tocopherol levels had hepatic cirrhosis. One had chronic alcoholism, and treatment of his contracture was a failure. The author maintained that extensive liver disease affects both the absorption and storage of vitamin E. Other investigators have found vitamin E deficiency related to the production of dietary hepatic necrosis in rats¹² and low blood alpha-tocopherol levels in human patients with cirrhosis.^{13,14} However, clinical evidence of vitamin E deficiency has not been recognized in man, nor has it been possible to relate it to the development of cirrhosis in chronic alcoholism. Moreover, the role of tocopherol in the genesis and treatment of Dupuytren's contracture and related conditions has had mixed acceptance, at best.¹⁵⁻¹⁷

Our clinical impression that the patient with chronic alcoholism and hepatic cirrhosis in this hospital is likely to have Dupuytren's contracture is supported by the results of this study. This finding in 66 per cent of male alcoholic patients with cirrhosis is to be compared with that of 12 per cent in male controls. The control group was selected to indicate the

to palmar contractures than that in nondrinkers, although less than that in alcoholic patients with cirrhosis. Since portal cirrhosis may exist in some alcoholic patients in the absence of biochemical and physical abnormalities, these results could have been influenced by the inclusion of a number of patients with cirrhosis. The nature of this highly selected group also does not encourage statistical analysis of the data.

The review of Thorndike Memorial Laboratory files provides support for the initial impression, particularly in the males with a 42 per cent incidence of Dupuytren's contracture.

Despite the high prevalence of Dupuytren's contracture found in alcoholic patients with hepatic cirrhosis, certain reservations are relevant to any conclusions drawn. All patients were hospitalized at the Boston City Hospital or one of its branches, constituting a degree of selection that precludes application of the results to any other population. The presence of alcoholism and hepatic cirrhosis was not studied in cases presenting as Dupuytren's contracture, and the occurrence of these diseases in patients with pal-

TABLE 5 (Concluded).

GROUP	FEMALE PATIENTS 51-60 YR. OF AGE		MALE PATIENTS 61 YR. OF AGE & OVER		FEMALE PATIENTS 61 YR. OF AGE & OVER		MEAN AGE	
	ALL PA- TIENTS	PATIENTS WITH DUPUY- TREN'S CONTRAC- TURE	ALL PA- TIENTS	PATIENTS WITH DUPUY- TREN'S CONTRAC- TURE	ALL PA- TIENTS	PATIENTS WITH DUPUY- TREN'S CONTRAC- TURE	MALES	FEMALES
							yr.	yr.
Alcoholic patients with cirrhosis of liver	2	1(50%)	9	8(89%)	7	1(14%)	52	49
Nondrinkers with no liver disease	4	0(0%)	11	1(9%)	9	0(0%)	54	58
Alcoholic patients without cirrhosis	2	1(50%)	4	2(50%)	3	2(67%)	48	62
Alcoholic patients with cirrhosis*	7	3(43%)	24	15(63%)	11	4(36%)	50	48
Totals	15	5(33%)	48	26(54%)	30	7(23%)		

*Thorndike Memorial Laboratory files.

rate of occurrence of palmar contracture in a group of patients of similar age, sex and economic status and differing by virtue of the absence of alcoholism and liver disease. The highly selected nature of both groups makes it impossible to apply standard statistical measures to these data. Nevertheless, the prevalence of Dupuytren's contracture in alcoholic patients with cirrhosis of the liver in this series is distinctly higher than that reported in the general population^{2,4,5} whereas the control group produced about the expected number of cases. Results in females tend to support those in males, but are less distinct and are based on fewer observations.

The study of patients with chronic alcoholism without evident liver disease suggests a greater propensity

mar contracture remains speculative, but deserves consideration. In the course of this study it was noted that many of the alcoholic patients were of Irish origin whereas the control contained fewer of this ethnic group. It is possible, therefore, that ethnic and familial factors influenced our results. Finally, the findings in woman, although tending to support the other data, are based on insufficient clinical material to warrant conclusions for that sex.

We have not attempted to establish whether palmar contraction is a result of alcoholism or liver disease. However, on the basis of our findings it appears possible that factors predisposing to hepatic involvement in the alcoholic person also contribute to the development of Dupuytren's contracture.

SUMMARY

A study was undertaken to verify an earlier clinical impression that Dupuytren's contracture occurs frequently in patients with chronic alcoholism and cirrhosis of the liver treated at Boston City Hospital.

Fifty-seven alcoholic patients with cirrhosis, 55 alcoholic patients without manifest liver disease and 53 patients who were nondrinkers and had no evident liver disease were studied for prevalence of Du-

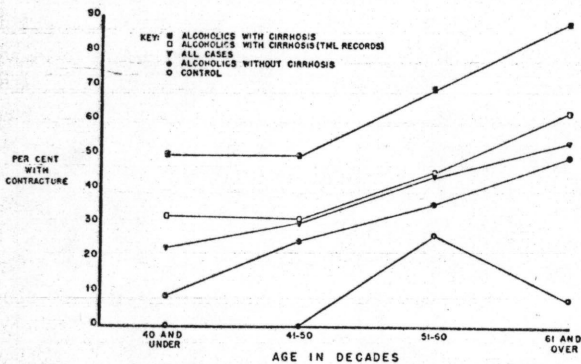


FIGURE 2. Age Distribution of Cases of Dupuytren's Contracture among Male Patients.

puytren's contracture. In addition the files of Thorndike Memorial Laboratory were reviewed to determine the prevalence of Dupuytren's contracture in patients with hepatic cirrhosis seen in the past ten years.

Palmar contracture occurred in 66 per cent of the male alcoholic patients with cirrhosis, 27 per cent of the male alcoholic patients without liver disease, 12 per cent of the male controls and 42 per cent of the male cases taken from Thorndike records. Deformity occurred at an earlier age in alcoholic patients with

cirrhosis of the liver. Results in females were based on insufficient numbers of observations.

The interpretation of these data is subject to limitations because of the selection of the populations studied.

We are indebted to Miss Claire Rowen for her assistance at the Long Island Hospital.

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MEDICAL PROGRESS

NEUROLOGY (Concluded)

WILLIAM K. JORDAN, M.D.,* AND H. HOUSTON MERRITT, M.D.†

LITTLE ROCK, ARKANSAS, AND NEW YORK, NEW YORK

EPILEPSY

The convulsive disorders were the subject of a comprehensive review in this journal a short time ago. Only a few topics in this field will be discussed here.

Biochemical Lesion

Three components of a biochemical lesion in tissue slices prepared from human epileptogenic cerebral cortex have been reported by Tower⁶⁶: impairment

*Professor of neurology, University of Arkansas Medical Center.

†Professor of neurology, Columbia University College of Physicians and Surgeons.

of acetylcholine binding; metabolic loss of glutamic acid; and failure to maintain tissue potassium concentrations. An increase in cholinesterase activity of such tissue has also been demonstrated. Several of the metabolic defects are reversible by the addition of glutamine and asparagin, or adenosine triphosphate, to the medium surrounding the tissue slices.

Single-Unit Activity

Thomas, Schmidt and Ward⁶⁷ have made observations on the activity of single units in chronic cortical epileptic foci, produced in monkeys by the