ULNAR DEVIATION OF THE FINGERS

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The ulnar deviation of the fingers in rheumatoid arthritis has recently been dealt with in several publications (Bunnell, 1948; Fearnley, 1951; Rose and Kendell, 1952). Lush (1952) gives a list of the various aetiological factors so far described:

- (1) Gravity,
- (2) Pressure,
- (3) Muscle imbalance,
- (4) Unilateral laxity of capsules of metacarpophalangeal joints,
- (5) Changed shape of joint surfaces,
- (6) Disturbed function.

Another theory, put forward by Snorrason (1950, 1951), suggests that ulnar deviation is caused by the extensor tendons slipping off the knuckles.

The fingers of a normal hand when in a relaxed position form a direct continuation of the metacarpal bones. The fingers can then be moved in ulnar and radial directions both in flexion and in extension on the interphalangeal joints. In flexion the fingers tend to move slightly in the ulnar direction, while their capacity to move sideways diminishes as the flexion is increased, until in complete flexion, the collateral ligaments being fully extended, the fingers are locked.

Material and Methods

This investigation is based on 292 patients suffering from rheumatoid arthritis, whose metacarpophalangeal (mcp) joints were carefully examined. The age of the patients, the duration of the disease and of finger-joint symptoms, and the patients' occupation were noted. In order to ascertain the seriousness of the disease, the erythrocyte sedimentation rate and the objective symptoms in both wrists and elbows were taken into account.

For the purpose of the present investigation, cases were selected where a definite deviation in the resting position was coupled with the laxity of the mcp joints, the fingers then being fully flexed. A few cases in which, although there was ulnar deviation in the resting position, the functioning collateral ligaments forced the fingers back to the locked middle position, were excluded.

The material is divided into three groups: men, women, and children. Patients in whom the disease has

started before the age of 14 are included in the third group, which thus also contains a few adults. Each group is subdivided, according to whether ulnar deviation was present or not.

Results

Ulnar deviation of the fingers was found in 14.6 per cent. of men and in 28.6 per cent.—nearly double as many—in women. In the third group it was rare (only 3.3 per cent.). The percentage of the cases taken collectively was 21.2; the detailed results are shown in the Table.

In the cases of ulnar deviation, the average age, and the duration of the disease and of finger joint symptoms, were all considerably higher. Judging by the higher erythrocyte sedimentation rate and by the more common parallel symptoms, in both wrists and elbows, the disease here was more serious. In all the cases there were objective symptoms in the metacarpophalangeal joints, swelling, hydrops, or subluxation. Limited finger extension was fairly common, and was due in most cases to the volar subluxation of the first phalanges. Subluxation of the metacarpophalangeal joints was present in joints II, III, V, IV, I (grouped according to the number of cases). This is also in accordance with the cases of ulnar deviation.

The displacement of the extensor tendons which Snorrason regards as a primary cause of ulnar deviation, seems to appear in the most serious cases only.

It seems also that Bunnell's intrinsic + position (1951) cannot be counted among the *causes* of ulnar deviation. As a rule, the deviation is present in both hands simultaneously, but when it is found in one hand only, it was equally common in either hand in males, while in females the right hand was more often affected. The patient's occupation does not seem to have any bearing on the development of ulnar deviation.

The following appears to be the process of development. Swelling and looseness in all parts of the

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TABLE

PERCENTAGE INCIDENCE OF ULNAR DEVIATION OF THE FINGERS IN 292 CASES OF RHEUMATOID ARTHRITIS

Sex of Patients		Women		Men		Children		Total
Ulnar Deviation		Present	Absent	Present	Absent	Present	Absent	
Number of Cases		46	115	15	86	1	29	292
Average age (yrs)		42.0	38.2	45.3	36.8	16	11.6	36.4
Average duration of disease (yrs)		10.1	5.4	11.3	5.1	13	5.4	6.4
Average duration of finger joint symptoms (yrs)		9.3	4.2	9.1	3.7	13	5.8	5.4
Average erythrocyte sedimentation rate (mm./hr)		50.7	42.6	47.5	33.1	26	35.7	40.9
Objective symptoms	in wrists and elbows	43.5	19.1	40.0	16.3	100	44.8	26.0
	in metacarpophalangeal joints	100	58.3	100	43.0	100	44.8	62.0
Metacarpophalangeal joints	subluxation	65.2	2.6	73.3	1.2	100	17.2	17.5
	instability without subluxation	34.8	3.5	26.7	4.7	0	3.4	9.9
Limited finger extension		52.2	6.1	60.0	8.1	100	6.9	17.1
Displacement of extensor tendons		39.1	0	20.0	0	0	0	7.2
Ulnar deviation of fingers	right	21.7	—	26.7	—	0	—	4.8
	left	13.1	—	26.7	—	0	—	3.4
	both	65.2	—	46.6	—	100	—	13.0
Effect on ulnar deviation of flexion of metacarpophalangeal joints	increased	32.6	—	13.3	—	0	—	5.8
	diminished	8.7	—	13.3	—	0	—	2.1

metacarpophalangeal joint capsules and in collateral ligaments are caused by rheumatic inflammation. All the activities of daily living in which the use of both hands is required, tend to deviate the fingers in the ulnar direction, thus extending more the radial collateral ligaments. This extension is largest when the fingers, during this occupation, are in flexion at the metacarpophalangeal joints, when under normal circumstances the collateral ligaments are in tension. The radial interosseous and lumbrical muscles are extended, still retaining their acting capacity. Inactivity causes a general atrophy of the intrinsic muscles. In the early stages of the disease the patient is able to extend the fingers and move them, but owing to pain he seeks to avoid doing so. This causes a deformation of the metacarpophalangeal joint capsules so that ulnar deviation becomes the normal resting position of the fingers, but in most cases the fingers retain the ability to move in the radial direction.

The explanation why ulnar deviation is more common with females may be found in the fact that, apart from the more delicate structure of their bones, they are often obliged to go on with household work during the active stage of the disease, whereas the men have more opportunity for rest. The young patients with a chance of complete rest do not contract ulnar deviation, in spite of very serious rheumatoid arthritis.

That the collateral ligaments play an important part in preventing the development of ulnar deviation is shown by the following facts:

(1) In numerous cases of war casualties with ulnar and/or median nerve paralysis, ulnar deviation was never seen when the metacarpophalangeal joints were undamaged.

(2) In one case, treated by Dr. R. S. Mosiman and followed up by one of us, the patient had a severe traumatic claw hand. After resection of the collateral ligaments, a good flexion of the metacarpophalangeal joints was obtained; during a subsequent course of occupational therapy, ulnar deviation developed, which, in turn, was successfully treated by tendon transfer.

Summary

The incidence of ulnar deviation of the fingers has been examined in 292 unselected cases of rheumatoid arthritis. The condition was present in 14.6 per cent. of 101 males, in 28.6 per cent. of 161 females, and in 3.3 per cent. of thirty patients with infantile rheumatoid arthritis. It seems to have been caused by a relaxation of the collateral ligaments owing to rheumatic inflammation, coupled with the small activities of daily living which tend to deviate the fingers in the ulnar direction.

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Déviation cubitale des doigts

RÉSUMÉ

On étudia la fréquence de la déviation cubitale des doigts dans 292 cas pris au hasard d'arthrite rhumatismale. On trouva ce symptôme dans 14,6% des 101 cas masculins, dans 28,6% des 161 cas féminins et dans 3,3% des 30 cas d'arthrite rhumatismale infantile. La déviation semble être due au relâchement des ligaments latéraux,

consécutif à l'inflammation rhumatismale, associé aux petits mouvements de la vie quotidienne tendant à faire tourner les doigts en dedans.

Desviación cubital de los dedos

SUMARIO

Se estudió la incidencia de la desviación cubital de los dedos en 292 casos, tomados al azar, de artritis reumatoide. Encontrase este trastorno en el 14,6 por ciento de 101 casos masculinos, en el 28,6 por ciento de 161 casos femeninos y en el 3,3 por ciento de 30 casos de artritis reumatoide infantil. Este trastorno parece haber sido causado por un relajamiento de los ligamentos colaterales, consecutivo a la inflamación reumática asociada con los pequeños movimientos de la vida ordinaria en que los dedos tienden a desviarse en la dirección cubital.