

Short report

Hand contractures in Parkinson's disease

T KYRIAKIDES, R LANGTON HEWER

From the Department of Neurology, Frenchay Hospital, Bristol, UK

SUMMARY Three cases of hand contractures due to Parkinson's disease and possible mechanisms that may be involved in their pathogenesis are described.

Deformities of the hands and feet in Parkinson's disease were described as early as 1877, by Charcot.¹ He pointed out that they were not dissimilar to those of rheumatoid arthritis, except that there was no swelling or stiffness in the joints. Skeletal deformities, including hand contractures, were described by Martin² in post-encephalitic Parkinsonian patients. Gortvai³ reported on hand and foot deformities, in severely affected cases of Parkinsonism, and their correction by stereotactic thalamotomy. Hand and feet deformities are well described in the Parkinsonism-dementia complex found in Guam.⁴ Despite their early recognition, hand and foot deformities are not widely appreciated by clinicians dealing with Parkinsonian patients. Major textbooks describe these deformities briefly, or not at all.^{5 6}

Hand deformities, especially if they become contractures, can further compromise the functional ability and independence of already disabled patients. We report three cases of Parkinson's disease with hand contractures.

Patient 1

A 76 year old lady was diagnosed as having Parkinson's disease, when she presented mainly with rest tremor, in 1969. She was commenced on levodopa in 1971 with good response. In 1974 she began to experience drug-induced chorea and dystonic movements of the hands. In 1986 she developed bilateral deformities of her hands, with ulnar deviation, flexion of the metacarpophalangeal joints and hyperextension of the interphalangeal joints (fig. a). Within a year

the deformity of the left hand became fixed into a contracture. However, the patient continued to be functionally independent (80% on Schwab and England Scale)⁵ although she does have difficulty with tasks such as writing and manipulating buttons.

Patient 2

A 76 year old lady was diagnosed as having Parkinson's disease when she presented in 1978 with bradykinesia and rigidity. She initially responded to levodopa, but has gradually deteriorated subsequently with marked rigidity and dementia. She now spends most of her day sitting in a chair. In February 1986 she was noted to have bilateral hand deformities with flexion of the metacarpophalangeal and proximal interphalangeal joints. The left thumb was also flexed at the proximal interphalangeal joint (fig. b). Within a year the deformities became fixed into contractures. She is heavily dependent on others for most daily activities (20% on Schwab and England Scale) and has very poor hand function. She is unable to pick up a cup or hold a spoon.

Patient 3

A 79 year old man was diagnosed as having Parkinson's disease in 1985, when he presented with bradykinesia and rigidity. He was not given any treatment until 1987, because he remained fairly mobile. Over the previous 12 months he had developed bilateral hand deformities which became fixed into contractures. There is now ulnar deviation of the fingers with flexion at the metacarpophalangeal and interphalangeal joints (fig. c). He remains functionally independent (80% on Schwab and England Scale) but has difficulty with writing, using a knife and fork and manipulating buttons.

Discussion

We present three patients with hand contractures due to Parkinson's disease. In all cases careful clinical examination did not show any evidence of rheumatoid arthritis or Dupuytren's contracture.

The frequency of hand contracture in Parkinson's disease is probably low. Although we have not per-

Address for reprint requests: Dr. R. Langton Hewer, Consultant Neurologist, Department of Neurology, Frenchay Hospital, Bristol BS16 1LE, UK

Received 12 February 1988.
Accepted 15 March 1988

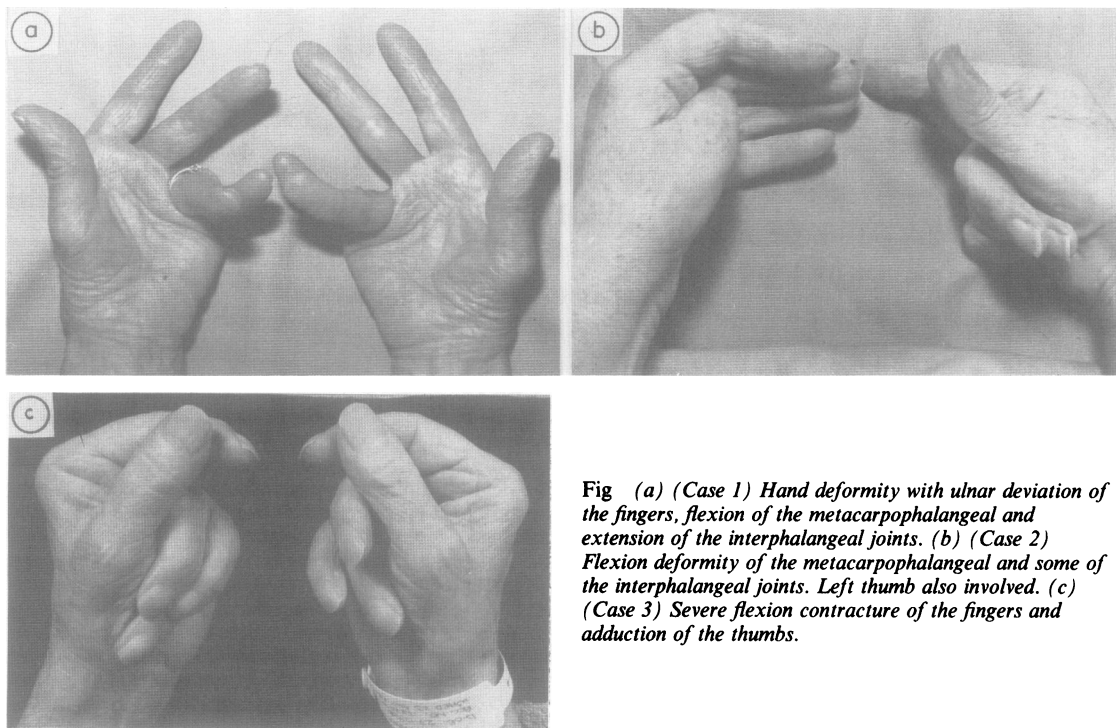


Fig (a) (Case 1) Hand deformity with ulnar deviation of the fingers, flexion of the metacarpophalangeal and extension of the interphalangeal joints. (b) (Case 2) Flexion deformity of the metacarpophalangeal and some of the interphalangeal joints. Left thumb also involved. (c) (Case 3) Severe flexion contracture of the fingers and adduction of the thumbs.

formed an epidemiological study, we have looked for this condition in our busy neurology department over the last 12 months and we found only three cases. Reynolds,⁷ in a series of 86 patients with Parkinsonism, reported an incidence of hand deformities of 40%. One third of their patients had post-encephalitic Parkinsonism and 71% of these had hand deformities. There were 58 patients with Parkinson's disease of whom 24% had hand deformities. This high incidence contrasts with our own experience, but Reynolds does not describe how he selected his patients.

The aetiology of hand contractures in Parkinson's disease is poorly understood and there are probably several mechanisms. Dystonia involving the hands, either due to the disease itself or more commonly, drug induced, gives rise to slight ulnar deviation of the fingers, flexion of the metacarpophalangeal joints and hyperextension of the interphalangeal joints.⁸ These deformities are initially intermittent and can be related to the timing of drugs, but later become contractures (Case 1). It is thought that overactivity of the small muscles of the hand is an important contributing factor in producing hand deformities in Parkinson's disease. It has been shown that blocking the ulnar nerve at the elbow with local anaesthetic can reverse finger flexion deformities, while stimulation of the same nerve in normal hands can produce finger

deformities similar to those observed in Parkinson's disease.³ The posture adopted by the patient, especially in cases with severe rigidity, also seems to be a contributing factor. The hand contractures of our second case (fig. b) are rather unusual in that there is flexion at the interphalangeal as well as the metacarpophalangeal joints. She was noted to grip the end of the arms of her chair for many hours during the day. Reynolds found that the occurrence of hand deformities was related to the degree of muscular rigidity, and unrelated to the extent or duration of tremor.⁷

In all of our patients, the added handicap of hand contractures substantially increased their disability. The most disabled patient (Case 2) had a Frenchay Arm Index of 0.⁹ It is noteworthy that in all three patients hand contractures become established within 12 months. It is clearly important that incipient hand contractures in Parkinson's disease are recognised and preventative measures taken early.

References

- 1 Charcot JM. *Lectures on the Diseases of the Nervous System*. Translated by George Sigerson. London. The New Sydenham Society, 1877.
- 2 Martin JP. *The Basal Ganglia and Posture*. London. Pitman Medical, 1967:100–17.

- 3 Gortvai P. Deformities of the hands and feet in Parkinsonism and their reversibility by operation. *J Neurol, Neurosurg, Psychiatry* 1963;**26**:33.
- 4 Kwang-Ming Chen, Chase TN. *Parkinsonism-dementia. Handbook of Clinical Neurology*. Vol 49. pp 167. Elsevier Science Publishers. Amsterdam. 1986.
- 5 Barbeau A. Andre. *Parkinson's disease: Clinical Features and Etiopathology*. Handbook of Clinical Neurology, Vol 49, pp 109. Amsterdam. Elsevier Science Publishers. 1986.
- 6 Walton J. *Extrapyramidal Syndromes. Brain's Diseases of the Nervous System*. Oxford. Oxford University Press. 1985;322-36.
- 7 Reynolds F, Petropoulos G. Hand deformities in Parkinsonism. *J Chron Dis* 1965;**18**:593-5.
- 8 Marsden CD, Parkes JD, Quinn N. *Movement Disorders*. London. Butterworth, 1981.
- 9 Wade DT, Langton Hewer R, Wood VA, Skilbeck CE, Ismail HM. The Hemiplegic Arm after Stroke; Measurement and Recovery. *J Neurol, Neurosurg, Psychiatry* 1983;**46**:521-4.