Clinical neurology

FOURTH EDITION

FRANCIS M. FORSTER

Clinical neurology

FRANCIS M. FORSTER, B.S., M.D.

Professor and Chairman, Department of Neurology,
University of Wisconsin School of Medicine,
Madison, Wisconsin

FOURTH EDITION

The C. V. Mosby Company

Saint Louis 1978

FOURTH EDITION

Printed in the United States of America

The C. V. Mosby Company
11830 Westline Industrial Drive, St. Louis, Missouri 63141

Library of Congress Cataloging in Publication Data

Forster, Francis M
Clinical neurology.

Bibliography: p.
Includes index.
1. Nervous system—Diseases. 2. Neurology.
I. Title. [DNLM: 1. Nervous system diseases.
WL100 F733s]
RC356.F6 1978 616.8 78-7343
ISBN 0-8016-1637-9

C/CB/CB 9 8 7 6 5 4 3 2 1

Clinical neurology

TO
B.V.M.H.

PREFACE

This book was first published in 1962. The purpose of the volume through these years has been to present the methodologies used in making an evaluation of the neurologic patient and the most significant features of the diseases in the field of clinical neurology. The presentation has been based on clarity and brevity, with emphasis on categories relative to their importance. Therefore the clinical entities occurring relatively infrequently have been set in reduced type.

Neurology can be a confusing field with a cluttering of eponyms. These eponyms have therefore been reduced to a minimum, and when these terms have been used, they usually have been included as parenthetical names.

This book was designed primarily for medical students as a primer when they begin their clinical work. It has also been found to be of extensive use in the paramedical field for nurses, occupational therapists, physical therapists, pharmacy students, social workers, rehabilitation counselors, various laboratory personnel, including EEG technicians, and various psychology students and technicians.

Since the book is not meant to be encyclopedic by any manner or means, adequate pertinent references are appended to each chapter.

Francis M. Forster

CONTENTS

Part one
EVALUATION OF THE NEUROLOGIC PATIENT

1 The neurologic history, 3

2 The neurologic examination, 9

3 Clinical diagnostic tests, 30

Part two
CLINICAL NEUROLOGIC ENTITIES

4 Vascular diseases, 47

5 Headache, 63

6 Epilepsy, 75

7 Diseases of the basal ganglia—the dyskinesias, 94

8 Multiple sclerosis and other demyelinizing diseases, 108

9 Tumors of the central nervous system, 115

10 Infections of the nervous system, 128

11 Trauma to the nervous system, 156

12 Diseases affecting the cranial and peripheral nerves, 168

13 Metabolic and toxic disorders of the nervous system, 178

14 Diseases of the muscles, 191

15 Degenerative and heredodegenerative diseases of the central nervous system, 202

16 Congenital anomalies and defects of the nervous system, 211

PART ONE EVALUATION OF THE NEUROLOGIC PATIENT

1 The neurologic history

In taking a neurologic history physicians search diligently into the where, why, how, and when features of a patient's complaints. Obviously questions are guided by their knowledge of the type of disease suspected. This section serves to establish some guidelines in questioning techniques. The questions asked depend largely on familiarity with the syndromes and diseases described in later sections of the book.

FAMILY HISTORY

The physician is interested in documenting the presence of neurologic disorders in the forebears, collaterals, and siblings of the patient. The exact questioning frequently depends on the presenting complaint of the individual patient. For example, if the patient has seizures, one is interested in whether there were convulsions, spasms, or seizures in the parents, grandparents, great-grandparents, cousins, aunts, uncles, or other relations. One also needs to inquire regarding spasms occurring in childhood or in association with fever. If the disorder involves the cerebellum or basal ganglia and is suspected to be familial, again one must inquire specifically about relatives such as parents, grandparents, aunts, uncles, and cousins. Details of the family illnesses are necessary. In migraine, for example, one needs to know the type of headache present in the family—not merely that headaches occurred.

PAST HISTORY

In inquiring into the past history of neurologic patients, it is important to have in most instances a clear record of the **an-**

tenatal and **perinatal circumstances.** The exact place in birth order is important (and it is important also to include miscarriages and abortions, in their proper order). Among other factors are questions such as whether the mother was exposed to any infections or trauma during her pregnancy, whether the delivery was normal, whether forceps were used, whether the infant was able to leave the hospital at the same time as the mother, whether there was any concern regarding the baby's health after birth, and whether oxygen had to be used.

The **developmental history** must be carefully determined. At what ages did the child begin to walk and to talk? How did he compare with his siblings? How did he progress in nursery school, kindergarten, and later educational situations? What were his relationships with other children?

The **occurrence of previous illnesses** must be documented, including the usual childhood diseases. Complications of childhood diseases are significant, especially with the exanthems and with inoculations. Inquiries are made as to the severity of any illness such as pneumonia. The degree of hypoxia and the duration of high temperature assume neurologic significance.

The role of head injury is sometimes difficult to evaluate. Most children have experienced some minor head injuries. Severity of a head injury is indicated by resultant loss of consciousness, the presence or absence of posttraumatic symptoms, whether the severity led to consulting the family physician, and whether the patient required roentgenologic examination.

PRESENT ILLNESS

The **onset of the present illness** usually can be fixed with fair accuracy. In the neurologic analysis one generally can identify the time of onset. In weakness of one side of the body, for example, it may be the time at which the patient had to change his job habits or when he found it necessary to rest after walking a particular distance. In the case of posterior column disease, history can fix the time at which it became necessary to

touch the washstand while washing the face with eyes closed.

The **chief complaint** must be exactly characterized. For example, in examining a patient with headache, the physician gives him a long list of characteristic descriptive terms (e.g., dull, throbbing, burning, pressing, stabbing, bandlike) and asks him to choose the appropriate term or terms. In episodic disturbances of the nervous system, the duration of individual episodes should be carefully documented, the longest, shortest, and average durations being specified. Associated symptoms are of great importance when disorders are episodic. The first interview is the ideal time to determine the usual frequency, as well as the shortest and longest time intervals between episodes. To document this accurately, the physician should record the times of the most recent episodes.

When a symptom is steadily progressive, it is often possible to obtain definitive **evidence of the progression.** For example, in weakness of one side of the body, some point can be established, such as the time when the patient could no longer walk a particular distance—like four blocks—or climb stairs or when the upper extremities could last be used in activities such as typing, playing the piano, or lighting a cigarette. Thus indications of progression or improvement are derived.

In all complaints the presence or absence of **precipitating factors** is ascertained. Precipitating factors play an important role, for example, in the rupture of cerebral aneurysms. Engaging in coitus or straining at stool often precipitates the symptoms of an existing aneurysm. When a patient with a brain tumor suffers sudden loss of consciousness after expelling an enema, the circumstance is highly suggestive of brain herniation at the foramen magnum and at the tentorium. In some cases of epilepsy, the quest for precipitating factors elicits those rare and unusual musicogenic epilepsies or startle epilepsies. In certain facial pain syndromes the precipitation by chewing or swallowing suggests immediately a glossopharyngeal neuralgia.

The **condition of the patient at the onset of the neurologic dis-**

order becomes of great importance, particularly when an episode has a relatively acute period of onset. An abrupt onset is characteristic of vascular disease. When this occurs during a period of decreased activity such as sleeping, it is more likely to be due to an encephalomalacia, whereas occurrence during a period of increased activity is more often found to be of hemorrhagic nature. In some of the rare central nervous system manifestations, posture also becomes important; for example, in carotid sinus syncope the attacks occur only when the individual is in a sitting or a standing position. In hypoglycemic attacks the importance of time relationship to food intake is obvious.

REVIEW OF SYSTEMS

A careful review of systems may give clues not only to the primary disease of the nervous system but also to general systemic diseases that may be causing the neurologic manifestations. With the neurologic patient therefore the physician is particularly careful to query the review of systems in regard to vision for such indications as the presence of blurring of vision, diplopia, or oscillopsia (visual awareness of nystagmus by the patient). These may be suggestive of multiple sclerosis. Hemianopsia occurs in the vascular types of headache. Evaluation of the eighth cranial nerve shows that tinnitus, progressive loss of hearing, and vertigo occur with lesions of this nerve—either neoplastic in nature or due to Meniere's disease.

A history of chronic severe upper respiratory infections such as mastoiditis or sinusitis may indicate the possible existence of brain abscess or meningitis. The presence of cough, wasting, weight loss, and night sweats raises the possibility of tuberculosis or carcinoma of the lung.

Dyspnea, tachycardia, and ankle edema, of course, point to cardiovascular disease and it concomitant effect on the cerebral circulation.

The presence of gastroenteric symptoms may suggest the

influence of a cerebral lesion on that system or, more commonly, the metastasis of a neoplasm of the gastroenteric tract to the central nervous system.

Review of the genitourinary tract symptoms may indicate a lesion that perhaps has spread to the nervous system, or it may give evidence of primary central nervous system involvement. Carcinomas, especially of the prostate, metastasize to the vertebral bodies. Tumors of the adrenal glands and kidneys, particularly hypernephromas, may metastasize widely to the central nervous system. Lesions of the central nervous system may produce retention of urine or urinary incontinence and, particularly in men, impairment of libido and potency.

In the **general review,** it is important to determine (1) if the patient has been exposed to toxic agents such as alcohol, heavy metals, or carbon monoxide; (2) whether his nutrition, including vitamin intake, has been adequate; (3) what preceding infections the patient has had and the therapy used therefore; and (4) what traumatic episode the patient has experienced, particularly in relationship to the disease entity, for example, head injuries in epileptics or back injuries in patients with lumbar disk syndromes.

It is not possible to formulate the detailed and precise manner of taking a history, since this varies with each individual patient. It depends on the nature of the illness that has brought the patient to the physician, on the patient's accuracy as a witness and his ability to communicate, and most important of all, on the physician's willingness to spend the time to search diligently and carefully and in a nonsuggestive way. It is always important to present the patient with multiple choices or descriptions so as to avoid putting words into his mouth. In history taking, the need for other witnesses, such as relatives and co-workers, is obvious.

Considerable skill must be developed in obtaining a patient's history. The mere putting down on paper of the recollections of the patient is not appropriate. The facts not only must be assembled but they also must be organized. In the acquisition of

facts, skill is necessary to direct the patient away from irrelevant musings but still pay attention to trivia. One of the physician's most important decisions concerns what is present illness and what is past history. The determination as to whether the chief complaint is part of a continuing illness or is a separate entity is an indication of the diagnostic process. Too often significant facts gathered by medical students and house staff are overlooked because in the organization of the material not enough emphasis was placed on what appeared to be an obscure fact.

Competent neurologists expect by way of the history to arrive at a reasonable differential diagnosis. The physical and neurologic examinations usually succeed in decreasing the choices in the differential diagnosis, and the laboratory is used to make the final discrimination between the two or three most likely alternatives. This is the most logical way to arrive at neurologic diagnoses. Most neurologists, when the history leaves them at sea, are extremely uncomfortable about the possibility of being unable to arrive at an adequate and competent diagnosis even after the detailed examination.

2 The neurologic examination

The neurologic examination of the conscious patient requires more patient participation than that required in other types of medical examinations. Therefore this puts a premium on the communication between physician and patient. The demonstration by the physician of what is wanted should accompany the command. For example, the examiner extends his own arms and abducts his fingers when he says, "Hold out your arms and spread your fingers." Sometimes other modalities of learning are also used. The command, given only, "Put your heel on your knee" is perplexing. The command should be accompanied by a light touch to one heel at the word "heel" and to the opposite knee at the word "knee." These simple techniques not only obtain improved patient participation and a smoothness of the examination but also heighten the patient's confidence in the examiner.

EXAMINATION OF STATION AND GAIT

If the patient is ambulatory, examination of the station and gait is usually performed at the beginning of the neurologic examination.

Station is tested by having the patient stand with feet closely apposed to each other, both heel and toe, first with the eyes open and then with them closed. A positive Romberg sign consists of marked swaying and falling when the eyes are closed. The patient is then instructed to open his eyes and to stand on one foot alone and then on the other so that the station is tested for each foot individually.

Gait is observed in the patient's usual walking pattern. The

patient is next asked to walk on his heels, then to walk on his toes, and finally to walk tandem, that is, apposing the heel on one foot to the toe of the other and continuing in this fashion—walking the "straight and narrow." These tests not only bring out **equilibration** but also are indications of **motor power** in the lower extremities. This can be tested further by having the patient squat and rise and then squat and duck walk.

EXAMINATION OF THE CRANIUM

The scalp is inspected for evidences of **injury,** both recent (such as hematomas) and remote (such as scars), for **congenital lesions,** particularly the hemangiomas, and for the presence of moles.

The cranium is inspected for **dyssymmetry** and is palpated to determine whether there are any **exostoses,** areas of tenderness, or depression of the skull. The cranium is ausculted for **bruits,** the most common places being over the temporal and frontal areas and over the orbit; also included is any likely spot indicated by history or other findings as the possible site of neoplasm or vascular malformation. At this point it is customary, in addition, to auscult the **carotid arteries** for bruits not transmitted from the heart and to palpate for the pulsations of the carotid arteries.

EXAMINATION OF THE CRANIAL NERVES

The **first cranial nerve** can be simply tested by using a piece of perfumed soap. The identification of perfume indicates that there is no anosmia.

The **second cranial nerve** is examined by direct funduscopy with observation for the clarity of the disk edges, presence of the cup, caliber of the veins, and evidence of exudate or hemorrhages. Alterations of these indicate papilledema or optic neuritis. Pallor of the disk indicates optic atrophy. The physician must be careful not to be misled by a normal difference between the nasal and temporal edges of the disk, the temporal normally being more sharply defined than the nasal