Optic Nerve. Clinical Examinations and Findings

K. Hoffmann, Hannover/FRG

Introduction

When discussing clinical pathology of the optic nerve, it must always be kept in mind that the second cranial nerve is not a ‘nerve’ in the sense of peripheral neurology. It is ontogenetically, morphologically and functionally a tract of the Central Nervous System equal to the spinal cord. That means regarding its clinical pathology that the optic nerve cannot only be affected by diseases of the eye itself, either circulatory, inflammatory, degenerative or neoplastic in origin. As part of the CNS it is prone also to cerebral conditions. It follows that pathological findings and their early diagnosis have a great value not only for the eye, but even more for the general health or even the life of the patient.

Methods of Clinical Examination

The clinical examination of a patient with suspected disease of the visual system, especially the optic nerve, has to start with a medical history taken as carefully as possible. For the experienced physician this alone may be the final clue for making his diagnosis. It has to be taken into account, however, that patients with optical disease frequently have other disorders of the CNS, and conversation or cooperation may be difficult. Relatives or friends should be consulted. Headache, nausea and vomiting, disseminated symptoms as well as a vascular history or a history of metabolic disorders give significant hints. Any kind of visual impairment, unilateral or bilateral, the onset, duration or periodicity can be of immense diagnostical value.

The ophthalmological examination of a patient with a suspected disease of the visual pathways must be divided into two different parts:

Fig. 1. Impairment of central visual acuity = relative central scotoma (right: static, left kinetic perimetry)
Figs. 2 and 3. Synopsis of visual field defects: (1–7) retina to corpus geniculatum laterale, (8) radiatio optica, (9) visual cortex, (10) other parts of the fissura calcarina, (P) papilla nervi optici, (PRL) pupillary reflex to light, (hPSt) hemianopic loss of pupillary reflex

1. the subjective examination, which is the test of visual acuity as well as visual field. The results are of great, but by no means equal value: since an impairment of visual acuity may be a more alarming symptom for the patient, visual field defects can give very detailed diagnostic help. The importance of the examination of the visual field, especially also for follow-up studies, cannot be overemphasized.

2. the objective examination, including the position and motility of the eyeball, further neuro-ophthalmological signs such as ptosis and pupillary reaction. Of utmost value, however, is fundoscopy with inspection of the optic nerve-head, the optic disc.

ad 1. a) The investigation of visual acuity should include distant vision with the appropriate spectacle correction. The acuity of near vision may give some information as to the possibility of accommodation and on the fixation area.

ad 1. b) If impairment of visual acuity was complained of or is detected or suspected, the examination of the visual fields should start with the testing of the central field area in order to determine the presence and localisation of central or paracentral scotomas (Fig. 1). The examination of the peripheral visual field is an