

are present in the feet. Other neurologic conditions such as multiple sclerosis can cause paresthesias in the absence of other signs or symptoms.

JAMES B. GOLDEN, MD

REFERENCES

Crawford FA Jr: Thoracic outlet syndrome. *Surg Clin North Am* 1980 Aug; 60:947-956
 Gelberman RH, Aronson D, Weisman MH: Carpal tunnel syndrome—Results of a prospective trial of steroid injection and splinting. *J Bone Joint Surg* 1980 Oct; 62:1181-1184
 Mayfield FH: Cervical spondylotic radiculopathy and myelopathy. *Adv Neurol* 1979; 22:307-321

Symptoms Suggesting Brain Tumors

THE AVAILABILITY of computed tomographic (CT) scanning has revolutionized the diagnosis and treatment of brain tumors and has increased awareness of the diversity of clinical symptoms. In the past, detailed autopsy series have revealed approximately ten brain tumors per 100,000 people while clinical reports have suggested approximately half this incidence. Appreciation of the unusual clinical presentations of some of these tumors may insure that a higher proportion will be identified during life.

Symptoms of brain tumors can be divided into four general categories: headache and nausea, seizures, focal neurologic deficit and mental changes. Although headaches occur in most tumors, evaluation in patients with only headaches rarely identifies one. This is particularly true when funduscopic examination reveals venous pulsations and no papilledema.

Seizures are very common in patients with slowly growing tumors of the brain parenchyma and occur in many cases of extraparenchymal tumors and in about a third of rapidly growing

tumors. CT scanning has identified tumors in approximately 10 percent of patients examined for adult-onset seizures.

Focal neurologic deficits are abnormalities of function which identify a lesion in a specific area of the brain. Examples of focal neurologic deficits are unilateral weakness or unilateral hearing loss. These types of deficits occur in most brain tumors. However, small tumors, those in "silent" areas of the brain and tumors outside the brain but within the skull may not produce focal deficits.

Mental changes are common in very large and in rapidly growing tumors, particularly if located in the frontal lobes.

Traditional teaching is that tumors are characterized by a slow but steady progression of neurologic symptoms. This is not always the case. A third of patients with brain tumors are initially thought to have strokes; tumors cause 5 percent to 10 percent of spontaneous intracerebral hemorrhages.

We recommend investigation of patients by contrast-enhanced computed tomography if one or more of the following are present: headache with loss of retinal vein pulsations, papilledema, adult-onset seizures, focal neurologic deficit (unless a peripheral nerve or spinal cause is apparent) or progressive mental changes. This procedure should identify nearly all intracranial tumors.

CULLY A. COBB III, MD
 LYMAN MAASS, MD

REFERENCES

Cobb CA, Youmans JR: Glial and neuronal tumors of the brain in adults. In Youmans JR (Ed): *Neurological Surgery*, 2nd Ed. Philadelphia, WB Saunders, 1981, pp 2759-2835
 Gall MV, Becker H, Hacker H: Die Computer-Tomographie in der Diagnostik der Epilepsie. *Nervenarzt* 1977; 48:72-76

ADVISORY PANEL TO THE SECTION ON NEUROSURGERY

BYRON C. PEVEHOUSE, MD

Advisory Panel Chairman

CMA Scientific Board Representative

Section Editor

San Francisco

JOHN KUSSKE, MD
CMA Section Chairman
University of California, Irvine

GRANT GAUGER, MD
CMA Section Secretary
Oakland

RANDALL W. SMITH, MD
CMA Section Assistant Secretary
San Diego

ROBERT CRANSTON, MD
Immediate Past Section Chairman
La Mesa

GEORGE AUSTIN, MD
Loma Linda University

JOHN HANBERY, MD
Stanford University

BARRY N. FRENCH, MD
University of California, Davis

W. EUGENE STERN, MD
University of California, Los Angeles

JOHN F. ALKSNE, MD
University of California, San Diego

CHARLES B. WILSON, MD
University of California, San Francisco

MARTIN WEISS, MD
University of Southern California
Los Angeles

JAMES B. GOLDEN, MD
Palo Alto

SIDNEY TOLCHIN, MD
La Mesa

DOUGLAS ENOCH, MD
Carmichael

PHILIPP M. LIPPE, MD
San Jose

RICHARD E. NEWQUIST, MD
Orange