Tumors of the lateral ventricles

Roberto Delfini, Michele Acqui, Piero Andrea Oppido, Raffaella Capone, Antonio Santoro, and Luigi Ferrante

Department of Neurological Sciences, Section of Neurosurgery, University of Rome “La Sapienza”, Rome, Italy

Abstract

Tumors are only rarely found in the lateral ventricles. Although various oncotypes of these tumors differ in growth rate and invasiveness they present the same clinical pattern with the same diagnostic and surgical problems. Thus we can consider them as a group. This series comprises 51 primary tumors arising strictly from the structures of the lateral ventricles, the majority from the trigone, operated on between 1952 and 1988: 20 meningiomas, 19 ependymomas, 9 papillomas of the choroid plexuses, and 3 subependymomas. As most of these tumors were benign, the response to surgical treatment was, as other authors have found, good with permanent cure or long survival in the majority of cases. Advances in neuroradiological techniques have greatly facilitated the work-up and differential diagnosis of these tumors. Of the various surgical approaches, the parieto-occipital is preferred by our department, even for tumors of the dominant hemisphere. Our operative mortality of 10.6% tallies with that of other workers.

Keywords: Clinical features, CT, lateral ventricle tumors, MNR, surgical approaches.

1 Introduction

Tumors of the lateral ventricles are a catch-all group of tumors, each having particular gross macro- and microscopical histological characteristics and differing in growth rate and in tendency to infiltrate the adjacent parenchyma. Nonetheless, it makes sense to consider them together because of their common site, frequent similarities of clinical development, common procedures of preparation and common problems of surgical approach implicit in the site. Since tumors of the lateral ventricles grow in a non-functional space, they may attain considerable size before they are diagnosed. Most of these tumors are benign or of low malignancy, and their removal may, therefore, result in permanent cure or long survival. Further, their low malignancy generally renders them resistant to treatment other than surgical excision. This treatment has to be planned and performed with extreme accuracy, for otherwise morbidity and mortality can be high. It is important to bear in mind that these tumors are relatively rare and, therefore, outside the routine experience of the majority of neurosurgeons. We report the case series of our department, emphasizing the salient clinical features of these tumors, the principal specific characteristics revealed by modern neuroradiological imaging, the criteria of choice for surgical approach, and the longterm results.

2 Material and method

Of the 6300 tumors of the cerebral hemispheres operated on in our department between January 1952 and December 1988, 51 were located solely or mainly in the lateral ventricles. All the tumors included in this series were primary tumors arising from the structures belonging to the lateral ventricles (choroid plexus, tela choroidea, ependyma). The series included 20 meningiomas, 19 ependymomas, 9 papillomas of the choroid plexuses, and 3 subependymomas.

2.1 Meningiomas

Of 1388 intracranial meningiomas operated on in this period 20 were of the lateral ventricles (1.4%). The age range of the patients, 13 females and 7 males, was 14 to 64 years with a mean of 32 years. The length of the clinical history ranged from 6 months to 4 years (mean 27 months). The first symptoms were headache in 12 cases (60%), epilepsy in 5 (25%), psychic disorders in 2 (10%) and paresis of the contralateral lower limb in 1 (5%).
Neurological examination at admission showed: motor deficits in 13 cases (65%), intracranial hypertension in 10 (50%), homonymous lateral hemianopia in 9 (45%), sensory deficit and aphasia in 6 (30%), dysmetria in 4 (20%), nystagmus in 3 (15%), and trigeminal hypoesthesia in 2 (10%).

CT scanning, performed in eight patients, imaged a hyperdense lesion with enhancement after contrast medium in all. Hydrocephalus was present in three cases and calcifications in four. All patients underwent angiography, which supplied indirect signs of the tumor in every case. The blood supply via the anterior and/or posterior choroidal arteries was evident in all and a tumor blush was clearly visible in 18 cases (90%).

The lesion was located on the left side in 12 cases, on the right in 8, and occupied the region of the trigone in all. 18 meningiomas were fibromatous, 1 psammomatous, and 1 endotheliomatous.

One patient died of cardiac arrest on day 6; 2 patients were lost to follow-up. For the other cases the follow-up ranges from 12 months to 31 years. Two patients with moderate hemiparesis and 6 with mild hemianopia lead normal lives. The neurological status of the others is absolutely normal.

### 2.2 Ependymomas

Of 140 intracranial ependymomas operated on in the period, 19 were located in the lateral ventricles (13.6%). 13 patients were female and 6 male (F/M: 2.2/1) and their age range was 7 to 59 years (mean 28.8). The mean length of the clinical history was 14.6 months; the longest was 9 years and the shortest was in a stroke case with neoplastic apoplexia (hemorrhage) not preceded by other symptoms. The first symptoms were headache in 10 cases (52.6%), epilepsy and psychic disorders in 4 (21%), and clouding of consciousness in 1 case (5.2%).

Neurological examination at admission showed: signs of intracranial hypertension in 12 cases (63.6%), psychic disorders in 5 (26.3%), phase disorders and homonymous lateral anopias in 4 (21%), hemiparesis in 3 (15.7%) and ataxia in 1 (5.2%). The examination was negative in 2 cases (10.5%).

Before CT was available, the great majority of patients underwent plain X-ray examination, pneumoencephalography, and/or ventriculography and brain scintigraphy. CT scanning was done in 10 patients, revealing increased density in 8 (80%) and patchy density in 2 (20%); hydrocephalus was present in 5 cases (50%) and intratumoral calcifications in 2 (20%). The tumor was enhanced after injection of contrast medium in 9 cases. Angiography was done in 12 patients and supplied indirect cases. Angiography was done in 12 patients and supplied indirect evidence of an intraventricular tumor in all of these; a tumor blush was present in only 4 cases (33.3%).

In 10 patients the tumor occupied the right lateral ventricle (52.6%), in 8 the left (42.1%), and in 1 (5.2%) both ventricles. The lesion was located in the ventricular trigone in 9 cases (47.4%), in the frontal horn and midventricular body in 4 (21%), and in the occipital horn and temporal horn in 1 (5.2%).

Removal was macroscopically total in all cases except in one in which the tumor infiltrated the caudate nucleus. In the cases considered, surgical inspection showed that four fifths or more of the tumor projected into the ventricle. In 10 patients the ependymoma was grade I, in 5 grade II, in 3 grade III and in 1 grade IV. All patients received radiotherapy at a mean dose of 5000 rads.

There were 4 perioperative deaths, all in the early years of the series and all classifiable histologically as grade I. The grade IV ependymoma recurred after about a year and the patient died. Of the 3 grade III ependymomas, one occurred 2 years later and one occurred 3 years later. These patients underwent reoperation and have had no recurrence one year after the second operation. The third patient with the grade III tumor is well 1.5 years after operation. Of the 5 grade II ependymomas 1 occurred 5 years later. The patient underwent reoperation but died 2 years later (the recurrence was more malignant: grade III). The other 4 patients with grade II ependymomas are well 6, 5, 3 and 2 years after operation. Of the 6 patients with grade I ependymoma, 1 has been followed up for 20 years and is well, 1 developed a frontoparietal primary neuroectodermal tumor after 9 years, during which time he was free from neurological deficits, and the other 4 patients are well 10, 7, 4 and 3 years after operation, although one presented with epileptic seizures at 4 years, controlled by drugs.

### 2.3 Papillomas

Of 27 intracranial papillomas operated on in the period, 9 (33.3%) were located in the lateral ven-