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Magnetic resonance imaging of an intraventricular craniopharyngioma

K. Ikezaki[1], K. Fujii[1], and T. Kishikawa[2]

Departments of [1] Neurosurgery and [2] Radiology, Saga Medical School, Saga, Japan

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Summary. A case of a craniopharyngioma confined entirely to the third ventricle is reported. MRI revealed an isointense and high signal lesion on T1- and T2-weighted images, respectively, with homogeneous enhancement by Gd-DTPA. The tumor was reduced by 90% in 4 months after 60 Gy radiation therapy. Intraventricular craniopharyngioma is unusual and is not associated with tumoral calcification or cyst formation.

Key words: Craniopharyngioma – Third ventricle – MRI

This 70-year-old woman exhibited mild mental impairment and intermittent bifrontal headaches progressive over 6 months; slight impairment of memory, paucity of thought and action, and slight papilledema. Axial plain CT disclosed mild hydrocephalus and an isodense round suprasellar mass with no calcification or cyst formation. Contrast-enhanced CT disclosed that the homogeneously enhancing mass was located entirely in the anterior half of the third ventricle (Fig. 1). The pituitary stalk and gland seemed intact. 0.15 Tesla resistive (MRT-15A Toshiba, Japan) showed that the mass in the third ventricle was isointense on T1-weighted spin echo images (Fig. 2a), high signal on T2-weighted spin echo images (Fig. 2b) and low signal on inversion recovery images (Fig. 2c). Administration of Gd-DTPA markedly shortened the calculated T1 value of the tumor from 469.3 ± 26.4 to 240.5 ± 18.3. The homogeneously enhancing tumor was delimited anteriorly by the lamina terminalis, superiorly by the anterior commissure and posteriorly by the line connecting the massa intermedia with the mammillary body. The tumor occupied the chiasmatic and infundibular recesses of the third ventricle. The optic chiasm was not enhanced. The tuber cinereum protruded inferiorly, but the tumor did not invade into the suprasellar cistern or into the hypothala-

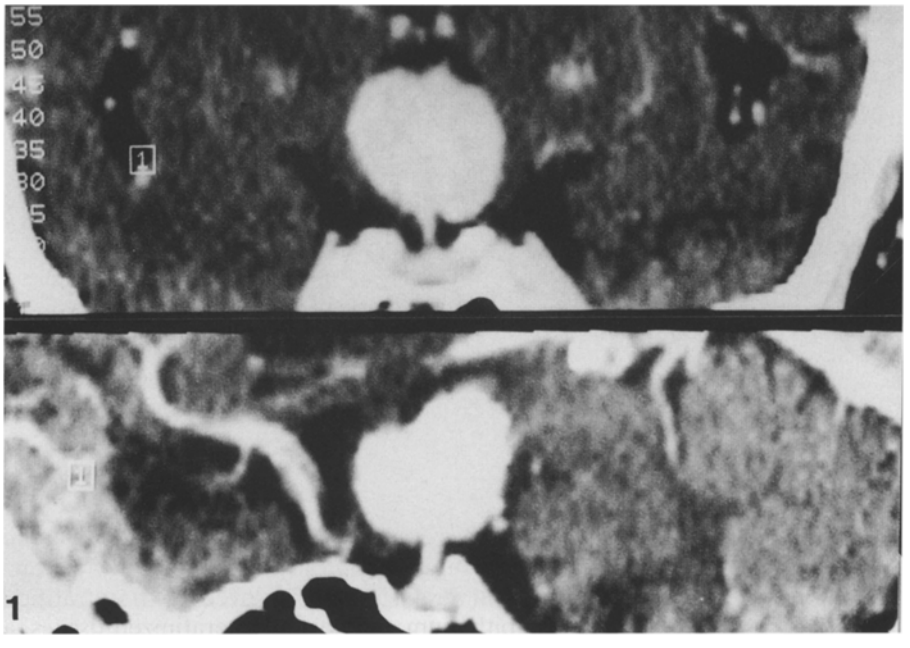
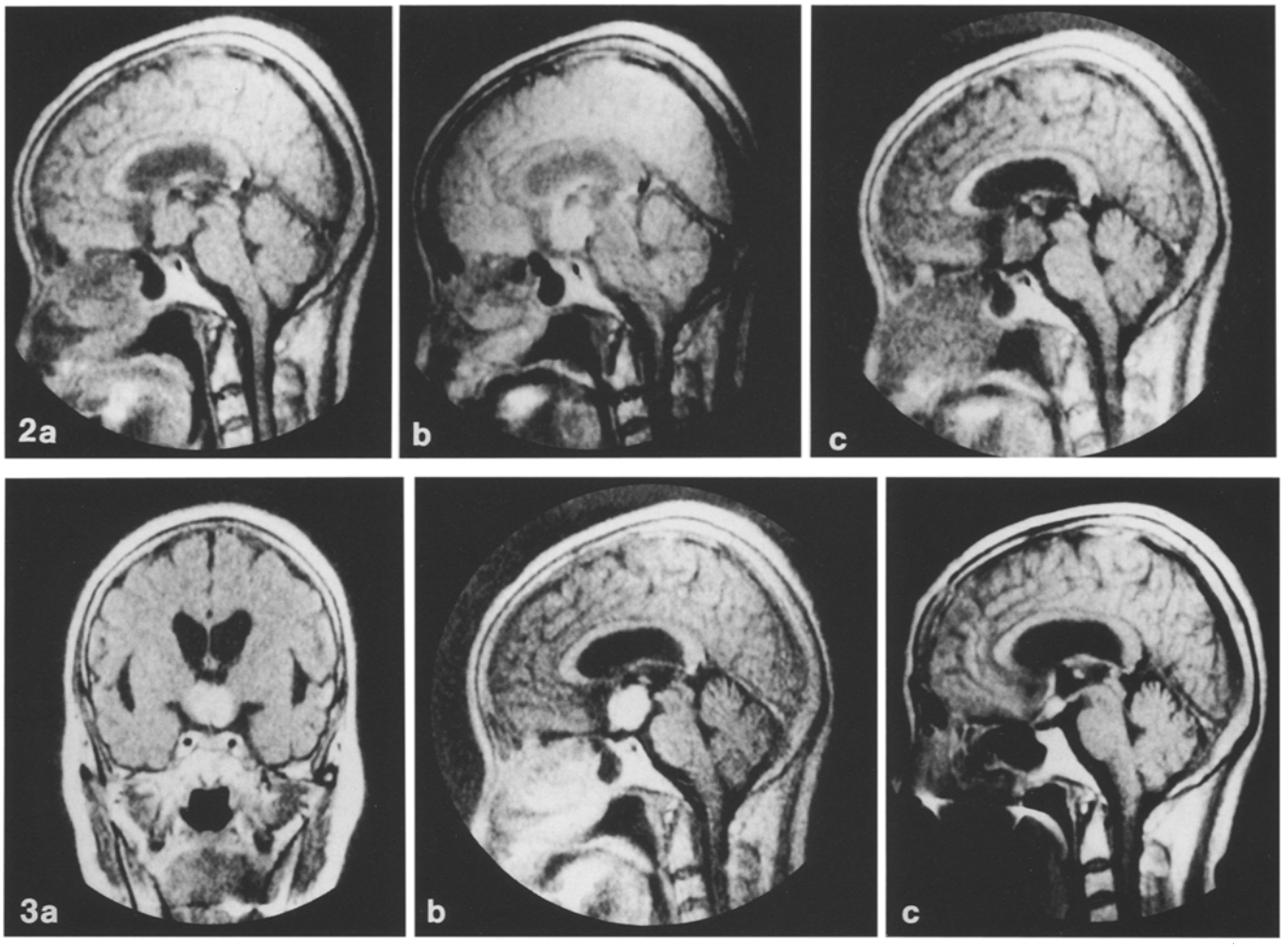


Fig. 1. Postcontrast coronal *(upper)* and sagittal *(lower)* reconstructed high resolution CT disclosed the solid and well enhanced mass in the third ventricle



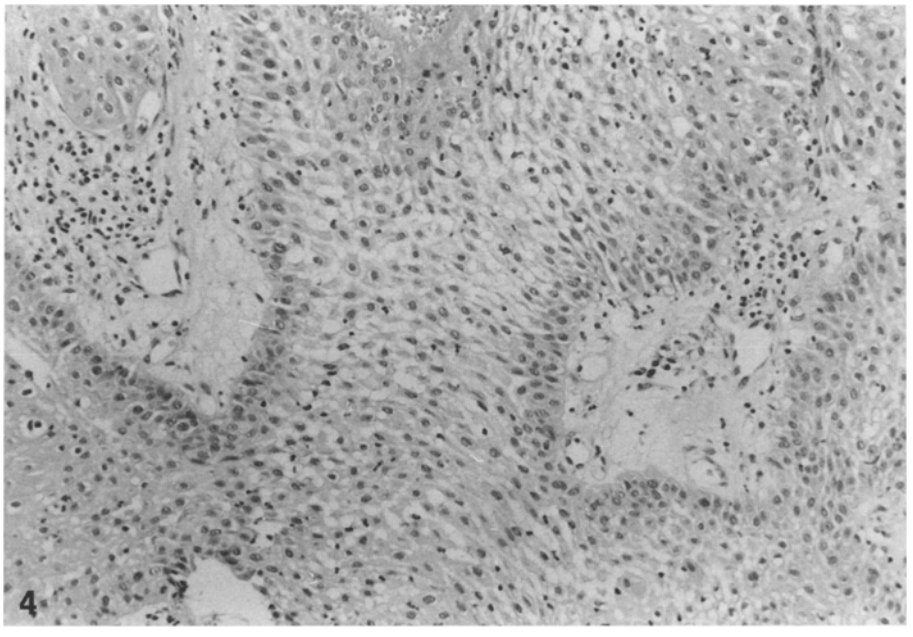


Fig. 2. **a** T1-weighted (TR 500/TE 30) SE, **b** T2-weighted (TR 2000/TE 30) SE and **c** IR (TR 2450/TI 450/TE 30) images of the tumor in the third ventricle

Fig. 3. Coronal **(a)** and sagittal **(b)** T1-weighted spin echo images after the administration of Gd-DTPA (0.10 mmol/Kg) reveal homogeneously enhanced mass situated wholly within the third ventricle. Although the pituitary stalk and tuber cinereum are enhanced as usual, the optic chiasm is not enhanced that suggest no invasion of the tumor. Sagittal T1-weighted spin echo image **(c)** disclosed residual enhanced mass lesion above the infundibulum, 4 months after the radiotherapy

Fig. 4. Microscopically, the tumor tissue consists of fragments of squamous cell epithelium resting on or lying in the edematous fibrous tissue. Parakeratinosis and slight keratinosis are observed in the surface layer. Calcification is absent. (H & E, X 100)

mus (Fig. 3 a, b). Left carotid digital subtraction angiography disclosed a faint tumor stain in the capillary to early venous phases. 99mTc scintigram showed abnormal uptake consistent with the tumor.

The tumor was controlled by partial resection via the trans lamina terminalis approach. Histologically, moderately hard and grayish tissue proved to be stratified squamous epithelium and partially keratinized tissues, a

squamous cell type craniopharyngioma (Fig. 4). Postoperative T1-weighted MRI disclosed 90% decrease in tumor size but persistent enhancement, four months after treatment with a total of 60 Gy of 4MV X-ray to the tumor bed over 6 weeks via right-left opposing, in 200 cGy fractioned doses (Fig. 3c).

Discussion

Craniopharyngiomas are neoplastic growths of squamous cell nests thought to arise in the pars tuberalis of the infundibulum and the tuber cinereum [1–3]. Craniopharyngiomas may be classified by location into 4 types: anterior, intrasellar, intraventricular, and posterior [4]. The latter two types are rare, with only 22 cases of the intraventricular type having been reported. Pathological studies suggest these rare tumors may result from upward growth into the third ventricle of epithelial cell nests located in the floor of the third ventricle in the region of the tuber cinereum or infundibulum [2, 3].

The present case and all previously described intraventricular craniopharyngiomas have the following characteristics: (1) older age, ranging from 26 to 70 years; (2) symptoms limited to headaches and progressive mental impairment, or fever of unknown cause secondary to ventricular dilatation with no evidence of visual field defects or endocrine dysfunction; (3) solid consistency grossly with squamous cell histology (except for one case); (4) isodense noncalcified, noncystic appearance on noncontrast CT and (5) homogeneous contrast enhancement [5–11].

There has been no prior report of the MRI features of an *intraventricular* craniopharyngioma. The solid portions of common suprasellar craniopharyngioma are slightly hypointense or isointense with normal brain on T1-weighted images and markedly hyperintense on T2-weighted images [12].

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K. Ikezaki, M. D.
Department of Neurosurgery
Saga Medical School, Nabeshima
Saga 849
Japan