the left ophthalmic vein.

The presence of cerebral ischaemia in our patient was evidenced by a central paresis of the left facial nerve and clumsiness of the left hand, and the presence of a small calibre fistula caused reluctance to attempt invasive therapy consisting of the occlusion of the fistulas with a detachable balloon via an arterial (internal carotid artery) or venous (superior ophthalmic vein, inferior petrosal vein) route.\(^4\)\(^7\) The patient improved, however, on conservative therapy despite the direct type of the fistula that mostly needs interventional therapy.

In our patient a traumatic cause could not be established. There was an emptying of the left side fistula through anastomotic vessels into the right side cavernous sinus and superior ophthalmic vein; a preexisting lesion of the left eye, possibly of thrombotic origin, may have been contributory to this overflow. The clinical course in this patient showed spontaneous improvement, thus precluding the necessity of invasive therapeutic interventions.

Subdural and intraventricular tension pneumocephalus after transsphenoidal operation

Sir: Cerebrospinal fluid (CSF) rhinorrhea develops in one to three per cent of patients\(^1\) after a transsphenoidal pituitary operation; it is often followed by simple pneumocephalus which usually resolves spontaneously. Tension pneumocephalus is extremely rare,\(^2\) and results in brain compression with rapid clinical deterioration. We describe a case and propose an explanation for its development.

For the previous 4 years, this 28 year old man had noticed progressive growth, coarsening of facial features and enlargement of extremities. He had classical acromegalic deformities and a computed tomographic (CT) scan demonstrated a large non-homogeneous pituitary tumour extending superiorly to the third ventricle. After radical removal of the tumour by a transsphenoidal approach, the neurosurgeon noticed a 3 mm opening in the diaphragma sellae through which clear CSF oozed. The sella was packed with synthetic fibrin sponge, sealed with glue and an external lumbar subarachnoid drain was inserted. Histological studies showed that the tumour was a mixed growth hormone and prolactin-secreting adenoma.

CT scan confirmed radical removal of tumour from the sella, which instead was filled with air. The CSF rhinorrhea ceased 2 weeks after operation. Eighteen days after operation, the patient was found to be drowsy. He had a fever and intense neck rigidity. CT showed a large air collection in the ventricular and subarachnoid spaces with a mass effect on the frontal lobes. The lumbar CSF drain was removed and the patient slowly recovered during the subsequent month. He was discharged taking hormonal replacement therapy and resumed his previous occupation as a high school mathematics teacher.

Simple pneumocephalus most frequently arises as a complication of a head injury in which a compound basal skull fracture with tearing of the meninges allows entry of air into the cranial cavity. It can also follow a neurological operation.\(^3\) Tension pneumocephalus is rare. Among the mechanisms that may be responsible is the combination of a fistula at the base of the skull and a CSF shunt as in a patient with hydrocephalus.\(^4\) The complication has been rarely encountered after transsphenoidal hypophysectomy.\(^5\) In our patient the placement of a lumbar subarachnoid drain may have precipitated the development of tension pneumocephalus through a simpler mechanism. We propose that loss of CSF as a result of both rhinorrhea and the lumbar catheter caused a drop in CSF pressure until the latter reached an equilibrium with atmospheric pressure. If the loss of CSF exceeds the production rate an equal volume of air enters through the fistula into the subarachnoid space.\(^6\) The sudden spontaneous resolution of rhinorrhea in our patient several days before discovery of pneumocephalus is consistent with this explanation. The collection of air in the ventricles prevented a significant shift of the midline structures and for this reason, an urgent decompressive operation was not considered to be necessary. Frequent radiographs after removal of the lumbar CSF drain showed progressive re-absorption of the intracranial air.

Direct repair of the fistula is considered standard treatment of CSF leaks after a transsphenoidal operation. An alternative to further operation is the use of a lumbar subarachnoid drain.\(^6\) In the latter cases, meticulous care of the drainage system is important to avoid excessive loss of CSF and the risk of tension pneumocephalus.

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When and on what to operate in multiple cerebral cysticercosis cysts?

Sir: The indications for surgical treatment in cerebral cysticercosis have been recently reviewed.4–6 Operation is indicated when a single cortical or an intraparenchymatous cyst causes focal symptoms or intracranial hypertension. Another indication is the presence of an intraventricular cyst causing internal hydrocephalus. When there are multiple cysts, treatment is controversial and some questions emerge; for example: when to operate? Which and how many cysts should be approached? Is there a place for only medical treatment?

Recently a 38 year old man was admitted to our department complaining of progressive weakness of his left leg for 13 days. He had suffered from epilepsy for 17 years and was controlled with phenobarbinate and phenytoin. On examination no signs of intracranial hypertension or meningeal irritation were observed. He had an ataxic gait and a paretic left leg (grade 3 MRC) with hyperreflexia, and foot clonus without a Babinski sign. CT examination (fig) revealed moderate dilatation of the third and lateral ventricles. Several rounded low-density areas varying in size were observed without contrast enhancement, in both hemispheres. Larger cysts were present in the left frontal and right parietal regions.

The cause of the left leg palsy was a large cyst located parasagittally in the right parietal region. There was apparently no oedema around the cysts and no major local mass effect. Some calcification was noted. These findings are typical of cerebral cysticercosis.3 Despite the administration of corticosteroids (dexamethasone—16 mg/day) for 5 days, there was an increase in weakness in the left leg and operation was performed. Through a right parietal craniotomy a cysticercotic lesion was exposed. It contained clear fluid and necrotic parasites. The cyst was totally removed with its capsule. The left frontal cyst was aspirated through a frontal burr-hole. The weakness of the leg improved immediately after the operation. On the fifth postoperative day a complete recovery of strength of the left leg had occurred. CT one week after the operation demonstrated no cyst in the right parietal region and a marked reduction of the size of the left frontal lesion. Fourteen months after the operation, the patient did not show neurological abnormalities. The seizures were controlled with phenobarbinate (100 mg/day) and phenytoin (300 mg/day).

The focal mass effect was the main cause of the progressive focal neurologic deficit in this patient. This was the reason for no response to the steroid therapy. The value of parasitides (praziquantel) is uncertain and may be even catastrophic. The destruction of the cyst or cysts may lead to a marked inflammatory reaction with increase of cerebral oedema.5 In our opinion cysticercosis cysts localised in functionally important areas of the brain should be considered for operation even when there are multiple lesions. Surgery should be performed if these cysts are producing focal symptoms and are accessible to surgical removal. Reduction of the size of the cysts may reduce the antigenic effect if further administration of parasitides is planned. This diminishes the inflammatory response commonly observed after the destruction of multiple cysts.6 CT guided stereotactic approach4 could be an alternative, for diagnosis and aspiration of such cysts.

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Ricardo Ramina
Walter D Arruda
Monica K F Parolin
Antonio CF Prestes
Unidade de Ciencias Neurologicas, Hospital Sao Vicente, R. Vicente Machado 401, 80.000 Curitiba—Brazil

Address for correspondence: Dr Ricardo Ramina, R. Goncalves Dias 713, 80240 Curitiba, PR, Brazil.

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R Candrina, G Galli and A Bollati

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