Brain Abscess Due to Gas Bacillus Infection

Report of a Case

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Brain abscesses due to gas-producing organisms are very rare. In their 1963 review of the literature, Russell and Taylor cited only 17 well-documented and culture-positive cases, 6 of which were reported before the introduction of antibiotics, (Rychlik, 1916; Wolfsohn, 1918; Pettermand, 1927; Maxwell, 1931; Bagley, 1938). Adding Case 8 of Heineman and Braude’s series, the total is 18 cases.

A characteristic feature of the circumscribed gas bacillus infection of the brain is the presence of gas in the cavity of the abscess. Out of a total of 12 x-rayed cases, 8 showed a noticeable gas bubble overlying a fluid level.

Generally speaking, gas bacillus abscesses of the brain evolve rapidly and the clinical course of the unattended patient is invariably fatal. However, the mortality rate of the adequately treated cases is not high (4 cases out of 18). Cairns et al. pointed out that the role of toxemia in this condition is rather minor, and concluded that bacillus abscesses are benign lesions.

Cairn’s viewpoint is justified by the results of the surgical treatment, for simple drainage of the purulent material from the abscess cavity is adequate to produce a marked improvement in the patient’s neurological as well as general status. It is also worth noticing that the mortality of the cases reported before 1945 is not much higher than that observed in more recent years.

It seems therefore that, although gas bacillus brain abscesses never develop a capsule, surgical treatment is more important than the use of antibiotics. In this paper we are reporting a case of successfully treated brain abscess due to a gas bacillus.

Case Report

Matteo C., a 14-year-old boy, was admitted on March 18, 1964. He had been suffering from left chronic otitis media since the age of 8. There had been several episodes of temperature elevation associated with drainage of purulent material from the left ear, but this had been controlled by the administration of antibiotics. The necessity of an operation had been suggested but the patient had always stubbornly refused to undergo surgery.

Two weeks prior to admission, the patient began to complain of progressively increasing pain over the left side of the head, followed by dizzy spells, vomiting and fever. A general practitioner noticed painful swelling of the left temporal area and sent the patient to the General Surgical Service of this hospital. A subgaleal abscess was diagnosed and incised, and a large amount of ill-smelling purulent material drained out. However, over the following 8 days, the patient’s general condition deteriorated and on March 18, 1964, he suddenly became hemiplegic and comatose. On the same day the patient was transferred to the Neurosurgical Service.

Examination. The patient was comatose. He reacted to painful stimuli with uncoordinated movements of the left side limbs. The pupils were unequal in diameter, the left being midriatic, and their reaction to light was sluggish. There was papilledema and marked retinal venous engorgement. There was a total right hemiplegia with peripheral paresis of the left facial nerve. Deep tendon reflexes were more active on the right than on the left side. The Babinski response was extensor bilaterally.

Radiological Studies. Skull films showed a gas bubble whose presence clearly indicated the existence of a gas bacillus abscess (Fig. 1a and b). A gas-fluid level was noticed. The bubble was made to move to the uppermost part of the cavity, by changing the position of the patient, and it was then possible to judge the size of the abscess cavity as approximately 6X5X7 cm. Nevertheless, it was decided to perform a left carotid angiogram in order to achieve a better radiological documentation of the case. The angiogram showed the following. In the antero-posterior view the anterior cerebral artery was markedly shifted to the right and engaged under the falx, while the middle cerebral artery appeared to be pushed upwards and inwards (Fig. 2). The lateral view showed a striking upward displacement of the middle cerebral artery. The temporal area was markedly avascular in the capillary phase. The gas bubble shadow could be seen just behind the middle cerebral artery (Fig. 3).

Operative Procedure. Surgery was performed under general anesthesia. A left temporal flap was turned down. Part of the temporal muscle was necrotic and was excised. Several osteomyelitic foci were seen in the lower half of the bone flap, which was generously rongeured. The dura mater showed no gross changes and was incised in the usual semicircular fashion.

The temporal lobe appeared to be increased in volume, edematous and soft. Through a vertical incision made at about 4 cm. from the tip of the temporal lobe, an abscess cavity was entered at a depth of about 8 cm. The cavity was about 6 cm. in diameter and occupied the anterior and middle portion of the temporal lobe. It was filled with stinking purulent material and gas which escaped under pressure.

The contents were evacuated and the abscess cavity was carefully inspected. There was no capsule: the wall of the cavity was simply necrotic brain tissue. This was
Gas Bacillus Brain Abscess

Fig. 1 a and b. Gas bubble with fluid level in left temporal region. Changes in position of head to demonstrate boundaries of abscess.

Fig. 2. Left carotid arteriogram. Anteroposterior view. Displacement of the anterior cerebral artery from left to right. Marked upward displacement of the middle cerebral artery. The air shadow shows underneath the middle cerebral artery.

Fig. 3. Left carotid arteriogram. Lateral view. Marked upward displacement of the middle cerebral artery. Notice the gas bubble and the air-fluid level.