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Chronic Granulomatous Abscess Simulating Cerebellopontine Angle Tumor

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The delayed development of brain abscess associated with a retained intracranial foreign body is not rare and has been documented [1-5]. We report an unusual case of chronic granulomatous abscess in the cerebellopontine angle region secondary to retention of a cotton ball during surgery for an acoustic neurinoma 20 years earlier. We describe the computed tomographic (CT) findings and emphasize that granulation tissue and abscess resulting from iatrogenic foreign body may simulate a mass lesion.

Case Report

A 68-year-old woman had intermittent purulent discharge from the left occipital region behind the left ear. She had undergone surgery 18 years earlier to remove a left acoustic neurinoma. Radiographs showed a left temporoparietal skull defect from previous surgery without evidence of osteomyelitis. A CT scan showed a calcified 6 × 3 cm mass in the left cerebellopontine angle with a low-density area medial to the mass (fig. 1). No enhancement was noted after intravenous administration of contrast material.

The patient was not seen for 18 months. In the interim she had developed progressive dyscoordination necessitating assistance with ambulation, and she complained of continuous nocturnal headaches. Physical examination revealed drainage from the left occipital region just medial to the upper part of the mastoid, along the line of the old surgical scar. There was a left facial palsy and decreased sensation in the trigeminal distribution. Her strength was good, but she had very poor coordination on finger-to-nose and heel-to-knee tests on the left as well as truncal ataxia. Repeat skull radiographs and CT scan showed no change. Cultures from the left occipital drainage grew coagulase-positive *Staphylococcus aureus*. Antibiotic treatment was instituted and a posterior fossa craniotomy was performed. A large, thick-walled abscess cavity in the left cerebellopontine angle yielded a 5 × 2 cm cotton ball and purulent material. The wall of the abscess was contiguous with the brainstem, displacing it to the right. After the abscess contents had been removed, it was evident that many of the patient's symptoms could be attributed to pressure from the medial wall. This was dissected free and a portion of it was removed. Pathologic examination of the surgical specimen revealed necrotic brain tissue with cotton material surrounded by acute inflammatory cells; granulating inflammatory tissue; and a fibrotic capsule with areas of calcification and foci of chronic inflammatory material.

Cultures from the surgical specimen grew coagulase-positive *S. aureus*. The postoperative course was stormy, and the patient died 2 months after surgery.

Fig. 1.—CT scan. Nonenhancing, calcified 6 × 3 cm mass in left cerebellopontine angle. Low-density area medial to mass, due to ex vacuo enlargement of fourth ventricle and probable old hemispheric malacic changes.



Discussion

The differential diagnosis of the CT appearance of a mass in the cerebellopontine angle includes tumors of the eighth nerve (vestibulocochlear or acoustic), which comprise 80% of all masses in this region; and other lesions (20%), of which about one-half are meningiomas. Less common lesions include metastasis, epidermoid and dermoid tumors, primary cholesteatoma, granuloma (sarcoid, tuberculoma), chordoma, glomus jugulare tumor, fifth- and seventh-nerve neuromas, arachnoid cyst, tumors of the temporal bone, aneurysms, and angiomas [6, 7]. In addition, tumors originating in the fourth ventricle, cerebellum, or brainstem may grow eccentrically and exophytically into the cerebellopontine angle [7]. The radiographic characteristics of these lesions have been described.

The finding of a brain abscess containing live organisms in association with a retained foreign body has been reported by others [1-5]. Usually the abscess formation occurs within

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a few weeks after trauma to the brain, but the symptom-free interval can be quite long—as long as 51 years in some reports [1, 2]. Grant [8] concluded that brain abscess rarely follows skull injury unless the dura mater is penetrated. In trauma to the brain, metallic foreign bodies are better tolerated than bone or other types of material [1, 8]. However, an acute abscess is more likely to develop around bone, whereas a delayed abscess is more likely to develop around metal [1]. All patients with retained intracranial foreign bodies must be considered at risk of developing a brain abscess, regardless of the time elapsed since the initial injury. Any change in the neurologic status of such patients should be viewed with suspicion. Baseline CT scans are valuable in the evaluation of latent changes.

There are many speculative explanations for infection remaining latent for years. The organism(s) present at the site of injury may be of low initial virulence; if it is not destroyed by the body's defense mechanisms, it will remain as an inactive focus [1, 4, 9]. With inadequate antibiotic therapy, the virulence of the organism(s) may be decreased but not eradicated, so that it lies dormant for years [1]. Then, an acute infection or debilitating disease may cause these organisms to become more virulent and/or active [1, 10]. Another possibility is that tissue surrounding the foreign body may have decreased resistance to infection, enabling casual blood-borne bacteria to lodge at such a point, thus leading to abscess formation [1, 4]. The presence of low-grade inflam-

mation around a foreign body may predispose to abscess formation by lowering local tissue resistance. Local hematoma also may increase the chances of abscess formation [1, 4].

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