

## Foreign Body Granuloma Mimicking Recurrent Intracranial Tumor: A Very Rare Clinical Entity

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**Abstract-** Gelatin sponge, oxidized cellulose and microfibrillar collagen are used to achieve hemostasis during neurosurgical procedures. Hemostatic agents may produce clinically symptomatic, radiologically apparent mass lesions. The differential diagnosis should include the foreign body along with recurrent tumor. We present a case of intracranial hemostatic agents found in a 56-year-old male patient seven years after undergoing a craniotomy for a left posterior parietal convexity meningioma. Preoperative magnetic resonance imaging (MRI) suggested the presence of a recurrent tumor. We emphasize that although it is rare, a granuloma due to a foreign body reaction can result in a false image of tumor recurrence.

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**Keywords:** Cranial tumor; Foreign body; Granuloma; Recurrence; Treatment

### Introduction

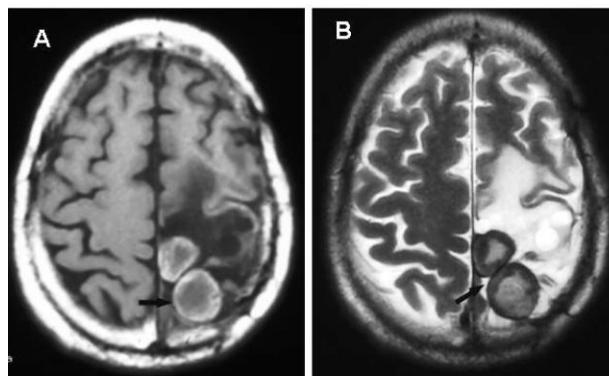
During craniotomy, hemostatic materials such as surgical pads and cotton pads are used to control bleeding (1-3). Although reasonable care is shown in this matter, there are rare cases where these pads are forgotten in the surgical area. This results in chronic inflammation characterized by foreign substance reaction and granuloma formation. Granulomas of the foreign body type following neurosurgical procedure are very rare (3-5). Cotton materials commonly used for hemostasis may cause a granulomatous reaction that may mimic recurrent or progressive neoplasm or abscess on postoperative imaging studies (3,4,6). This article discusses a case involving a cotton pad left in the surgical area where a craniotomy was applied due to meningioma, producing the effect of a mass and appearing as relapsed meningioma.

### Case Report

A 56-year-old man had previously undergone resection on a left parietal convexity meningioma at another institution. Seven years later, he was admitted to our institution with the complaint of headache, right hemiparesis, and seizures. T1-weighted, T2-weighted, and magnetic resonance imaging (MRI) demonstrated an enhancing mass in the resection cavity, which was

suggestive of a recurrent tumor (Figure 1).

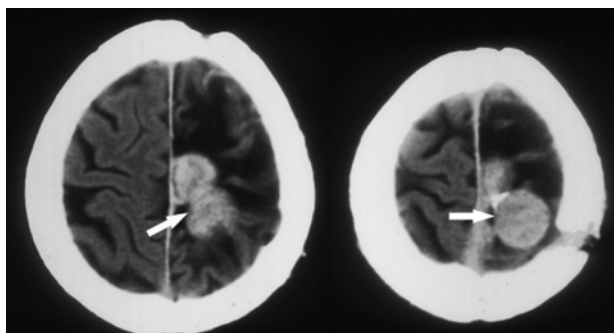
In addition, there was evidence of a previous craniotomy with an adjacent left posterior-parietal lobe encephalomalacia (Figure 2). It was believed that the mass might be a foreign substance or relapsed meningioma, and as a result, the patient was operated upon. During the craniotomy, it was observed that the mass was a sponge with surrounding granulation tissue. During surgical exploration, the tumor was determined to be globular, partly lobulated, hard, and well demarcated.



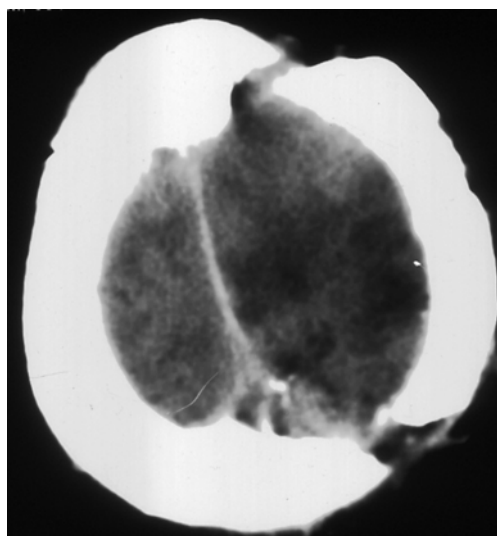
**Figure 1.** (A) An axial T1-weighted magnetic resonance image shows enhancement of the cotton pads. Encephalomalacia is presenting adjacent to the mass. (B) Axial T2-weighted magnetic resonance imaging demonstrates an enhancing mass in the resection cavity, which was suggestive of a recurrent tumor.

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**Figure 2.** An axial CT scan shows a previous left craniotomy with a mimicking meningioma in the left parietal region.



**Figure 3.** A postoperative axial CT scan shows neither a foreign body nor evidence of a tumor.

The sponge and surrounding granulation tissue were removed. A sample taken from the surrounding tissue was analyzed in terms of histopathology. Consequently, a foreign substance reaction and chronic inflammation were identified. The postoperative condition of the patient was good, and he did not suffer any attacks. No new mass was identified following control computerized tomography (CT) examination (Figure 3).

## Discussion

Hemostatic agents are widely used in neurosurgery to aid in hemostasis (3-5). They may cause a foreign body reaction, which appears on MR images as identical to recurrent tumor. Clinical symptoms caused by foreign body granuloma may appear months or even many years

after a surgical procedure (2,3,6). The first assumption that arises in the cases of a lesion in a previous operation area is tumor relapse. Unfortunately, clinical symptoms caused by a foreign body granuloma can suggest neoplasm clinically, radiologically, and even grossly. Abscess, radiation necrosis, bleeding into infarcts, and the normal operation scar need to be considered for definitive diagnosis (3,4,7). In the literature, there are very few cases where foreign substance granulation occurs due to hemostatic substances that mimicked relapsed meningioma (4,5,7). Although a sponge or cotton pad forgotten during the operation is among the complications more commonly observed in other surgical branches, it is rarely reported in the neurosurgery literature (4,6,7). CT and MRI are not efficient methods for diagnosing cases involving foreign substances. Regarding patients who have undergone craniotomy, foreign substance reaction considered in the case of heterogeneous hyperintensity is identified in T2-intensive examinations and in the case of hypointensity is identified in T1-intensive MR examinations (5-7). In this case, where the mass appeared as heterogeneous and hypodense during cranial tomography, the possibility of a foreign substance reaction was considered. If a central hypointense mass is contrast-enhanced in MR imaging, a reaction to a foreign substance is the primary suspected cause. In this case, two sponges were removed from the surgical area. In general, black radiopaque rope is attached to cotton pads and sponges to remind the surgeon that the cotton is there and to make it easily visible in direct graphy. This approach also enables faster diagnosis during control imaging at the time of surgery (3,7). In patients with a history of craniotomy, cotton granuloma should be considered in the differential diagnosis. We believe that the technique described above should be utilized in addition to solid hypointensity on T2-weighted images, which has been reported as helpful in identifying characteristic cotton granulomas.

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