Case report of a long term cotton string granuloma mimicking intracranial tumor

Alexandru Valentin Papacocea¹*, Marius Toma Papacocea²

Abstract: We report a rare case of an iatrogenic intracerebral inflammatory reaction to a piece of cotton left inside the brain for 11 years. A 33 year old women was operated for an intracerebral non-traumatic hematoma. Nine years after surgery she started to have partial and secondary generalized seizures, with an increasing frequency. She was diagnosed with an intracerebral tumour located in the former location of the parietal hematoma, but she systematically refused a new operation. Eleven years after the initial surgery for hematoma, she accepted removal of the presumed tumour. It was a large granuloma produced by a piece of cotton.

Key Words: foreign body, granuloma, cotton, pseudo-tumour.

Intracerebral foreign bodies made of various materials can produce a local inflammatory reaction. Even oxidized cellulose has been incriminated for some granulomas [5]. Such lesions can mimic the evolution of a tumour [4]. Patients may remain clinically silent for a long period until neurological signs appear.

Intra-operative bleeding has always been a major problem in neurosurgery. Cotton strings are commonly used for temporary mechanical induced hemostasis. It is extremely rare but not impossible to mistakenly leave cotton strings inside the surgical field. Usually this accident is revealed soon after surgery through imagistic investigations often triggered by clinical signs. Still, the foreign body can be left there for a long period, being non or pauci symptomatic, but inducing a growing defensive response in the brain.

CASE PRESENTATION

A 33 year women was operated in 2004 for a non-traumatic parietal intracerebral hematoma. She was discharged in good condition and she didn't return for following. Nine years after surgery she was brought to the Emergency Room of our hospital after a grand mal seizure. CT imaging revealed a hyper dense mass in her left parietal lobe, close to the left ventricular atrium, well defined, with an extreme dense area inside. Also, outside the mass but adjacent to it, a metallic artefact was noticed, probably from a hemostatic clip. After administration of contrast substance it was no significantly enhancement. The unknown metallic artefact precluded MRI examination. Localization of the intracerebral process was very likely the same with the one of the former operated hematoma, as suggested by the craniotomy and by modification of the brain tissue around. Unfortunately, the patient didn't keep any medical records from when she had her first surgery, so we couldn't know the presumed cause of the hematoma.

We suggested surgery for removing the intracerebral mass, but the patient refused it. She was discharged with anti seizure treatment. In the following months she had many partial motor seizures and then

1) Ploiesti Emergency County Hospital, Department of Neurosurgery, Ploiesti, Romania
* Corresponding author: Ploiesti Emergency County Hospital, Department of Neurosurgery, 100 Gageni street, Ploiesti 100097, Prahova, Romania, E-mail: apapacocea@yahoo.com
2) “Sf. Pantelimon” Emergency Clinical Hospital, Department of Neurosurgery, Bucharest, Romania
secondary generalized seizures. She accepted surgery after almost two years of ineffective medical treatment, when seizures were almost weekly. Neither hemiparesis nor talking disturbances were present. Laboratory data were normal. The patient underwent removal of the parietal mass using the former skin incision and craniotomy. The intracerebral tumour was totally ablated, also the small hemostatic clip was removed. The mass was hard in consistence, well delineated from the surrounding brain, with a core consisting of material resembling cotton fibers. Based on this we concluded it was a granuloma caused by foreign body. Around the clip there was little modification of the brain tissue, with the appearance of a thin capsule (Fig. 2).

The postoperative course was good, with no complications. She was discharged without any neurological deficit. CT images demonstrated complete removal of the granuloma. The patient is seizure-free during her 11 months of follow-up.

The histological examination confirmed an intense giant-epitelioid granulomatous inflammatory reaction around amorfe, birefringent structures, suggestive for textile fibers. Immunohistochemistry reveals intense positivity of the epitelioid cells for CD68. GFAP was positive in the rare perilesional astrocytes.

**DISCUSSION**

Foreign body granulomas that arise after intracerebral surgery are very rare and they can cause neurological signs even after some years [2]. The inflammatory response of the brain seems to be very different depending of the material, with a much aggressive reaction to textile than metal in this patient. There have been reported foreign body inflammatory reactions after removal of an intracranial hematoma [3], but this case is peculiar due to his long asymptomatic period (Fig. 1).

We don’t know exactly what has triggered the seizures after 9 years. A reason of comitiality could be the size of the mass who reached a critical volume, but we have no evidence of the evolution. Another hypothesis is that septic emboli from transient bacteremia could produce micro abscesses in the granuloma [1]. This tissue has considerable potential for that, but also there was no clear evidence of infection.

On the other hand, it was reported that retain

**Figure 1.** Foreign body granuloma simulating tumor.  
| a | Preoperative CT image without contrast. A very dense core is noticed. |
| b | Preoperative post contrast CT image. No significant enhancement. |
| c | Preoperative CT image without contrast. Metallic artefact adjacent to superior border of the pseudo-tumour. |
| d | Postoperative CT image with contrast. No residual granuloma. |

**Figure 2.** Histologic appearance of foreign body granuloma (different magnifications). Fibrillar foreign material (cotton fibers) pointed by arrows. Extended areas of dense fibrous connective tissue with polymorphonuclear neutrophil leukocytes and histiocytes.
intracerebral foreign bodies can produce delayed seizures even without developing a surrounding granuloma. In those cases a tumoral aspect is less likely, but other pathologies can be suspected, for example a cavernoma [6].

CT appearance for foreign body granulomas is nonspecific, but some aspects can emphasize this possibility. A core of the tumour with different density can suggest the foreign body. The rich connective fibrous tissue will give the hiperdense image on native CT. Without an increased vascularity, foreign body granulomas don’t enhance significantly in the absence of an acute inflammatory response.

In conclusion, although rare, foreign body granulomas should raise a red flag in the differential diagnosis of intracerebral masses for patients with prior intracranial surgery. They should not be excluded even after several years of silent neurological status.

**Conflict of interest.** The authors declare that they have no conflict of interest concerning this article.

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### References