Pathological Laughter as a Presenting Symptom of Trigeminal Neurinoma

—Case Report—

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Abstract

A 26-year-old male presented with a trigeminal neurinoma manifesting as pathological laughter. After resection of the large tumor, the symptom disappeared completely. Pathological laughter sometimes precedes other manifestations of tumors around the brainstem and may be a useful localizing sign.

Key words: trigeminal neurinoma, pathological laughter, brain stem

Introduction

Pathological laughter is a sudden outburst of uncontrollable, spontaneous, and inappropriate laughter, and is an uncommon presenting feature of brain tumors. Only six cases of extra-axial brainstem tumors associated with inappropriate laugh have been described, consisting of two meningiomas, three chordomas, and one bilateral acoustic nerve tumors, all located ventral to the pontomesencephalic area. Intra-axial brainstem tumors presenting with pathological laugh have also been reported, again located in the pontomesencephalic brain.

We describe a large trigeminal neurinoma presenting with the principal symptom of pathological laughter.

Case Report

A 26-year-old male had manifested uncontrollable explosive laughter during conversation for a year. The laughter lasted for a few seconds and stopped abruptly, whereafter the conversation would continue again. During these periods he lost track of the conversation and was unaware of the pathological emotional outburst. The frequency of these episodes progressively increased over the period to four to five within half an hour of conversation. At the end of each episode he would pick up his broken stream of thoughts and continue the conversation once again. In addition he had paresthesia and numbness in the right half of face, giddiness, and progressively worsening ataxia for about the same period.

Neurological examination showed that his higher functions were normal. Both fundi showed papilledema. The right corneal reaction was sluggish and there was hypesthesia in the maxillary and mandibular divisions of the trigeminal nerve. There were no other abnormal findings. Magnetic resonance (MR) imaging showed a large tumor extending from the

Fig. 1 left: T₁-weighted MR image showing a large tumor anterolateral to the brainstem and extending into the middle fossa in relationship to the cavernous sinus. right: Proton-density MR image showing the extension of the large trigeminal neurinoma.
left prepontine to medial temporal region (Fig. 1). The midbrain, pons, and the cerebellum were severely deformed by the tumor. The petrous apex was eroded. The ventricles were moderately dilated.

The tumor was resected via an infratemporal fossa "interdural" approach (Fig. 2). The tumor was soft and only moderately vascular and could be removed with relative ease. A large number of fibers of the fifth cranial nerve were preserved. Histological study showed that the tumor consisted of spindle-shaped cells arranged in interlacing bundles. There was abundant hyalinized stroma. The features were consistent with the diagnosis of neurinoma (Fig. 3).

He was relieved of his pathological laughter immediately after surgery. One year later the paresthesia over the face had significantly reduced and ataxia had completely cleared. There was no recurrence of pathological laughter.

**Discussion**

Various causes for the processes resulting in the pathological laughter phenomenon have been proposed, ranging from epileptic phenomena, degenerative, demyelinating, and neoplastic diseases to vascular occlusive disease. Lesions in the brainstem rarely cause abnormal emotional activity. Cairns described a patient with a large spongioblastoma multiforme of the pons who would cry, laugh, and make noises like a dog during sleep. Kubik and Adams noted that some patients with basilar artery occlusion found at autopsy had shown occasional pathological laughter and crying. Davison and Kelman showed that the majority of lesions causing pathological laughter are located in the diencephalic areas. Badt reported a patient manifesting pathological laughter in the prodromal stage of hemiplegia. Autopsy found bilateral lesions in the pons, caudate nucleus, putamen, and internal capsule.

In contrast to a patient with insight into his disease, our patient was unaware of his abnormal behavior during the pathological spasmodic outbursts of laughter. Most patients with brain tumors presenting as pathological laughter have no causal thought or emotional experience. None of these patients reported finding anything funny in their mind during such an episode. Pathological laughter may merely be the hollow, external manifestation of mirth.

Stern and Brown suggested that the "body reverberation is not per se the emotion" and considered that pathological laughter is an abnormal discharge of a system that controls the muscles of emotional experience (and their closely allied respiratory muscles) without the "feeling tone." These episodes are unrelated to the consciousness of the patient. Most have been reported to occur in wakefulness and sometimes even in the midst of an ongoing conversation. However, Cairns and Matsuoka et al. reported cases of occurrence during sleep.

Pathological laughter sometimes precedes other neurological manifestations and may be a useful sign in the localization of the lesion. In our patient, the symptom of pathological laughter was clearly related to the presence of the large tumor, as complete resolution of this symptom occurred immediately after resection of the lesion.

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