The original nerve of a greater occipital nerve schwannoma causing occipital neuralgia identified with magnetic resonance neurography

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Short Report

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Abstract

Background: Schwannomas are benign tumors arising from Schwann cells in the peripheral nerve and rarely develop at suboccipital area. We report a case of a greater occipital nerve schwannoma causing occipital neuralgia. The original nerve of the schwannoma was identified with magnetic resonance neurography.

Case presentation: A 69-year-old male patient was admitted for a suboccipital mass. Physical examination revealed an about 4cm beaded masses subcutaneously at suboccipital area. Magnetic resonance imaging showed that the lesions were not suppressed on 3 dimensional T2 weighting with fat suppression. Three dimensional fusion images (3 dimensional T2 weighting with fat suppression and 3-dimensional computed tomography) clearly revealed the original nerve of the lesions. The patient underwent a complete excision on the tumor. Histopathological examination diagnosed it as a schwannoma.

Conclusion: The present case is instructive in terms of not only a rare case but also the following of the original nerve with magnetic resonance neurography.

Introduction

Schwannomas are benign tumors arising from Schwann cells in the peripheral nerve. They usually develop at the head and neck region but rarely at suboccipital area. Moreover it is difficult with imaging examinations to identify the origin nerve of a schwannoma at the head and neck region [1, 2]. The present case showed the suboccipital mass causing occipital neuralgia. Magnetic resonance imaging (MRI) examination demonstrated the tumor originated from the greater occipital nerve. This is the first case whose the original nerve of a greater occipital nerve schwannoma was identified with magnetic resonance (MR) neurography.

Main text

Case description:

A 69-year-old male patient was observed a swelling mass with tenderness with radiation to the top of head in the left upper medial neck, which had been growing for 5 years. Physical examination revealed an about 4cm beaded masses subcutaneously at suboccipital area. It was firm and immobile. There were no abnormal findings at the skin surrounding the lesions. Ultrasonography showed homogeneous low echoic beaded mass. MRI studying revealed low signal on T1 weighting and enhanced lesion on gadolinium-enhanced imagings. The lesions were not suppressed on 3 dimensional T2 weighting with fat suppression (Fig. 1). Three dimensional fusion images (3 dimensional T2 weighting with fat suppression and 3-dimensional computed tomography) at the workstation (Ziostation2, Ziosoft Inc., Tokyo, Japan) clearly revealed the original nerve of the lesions (Fig. 2).
The patient underwent a complete excision on the tumor. He was placed in a prone position under general anesthesia. After linear skin incision, surgical exploration showed gray-pink encapsulated beaded tumors with elastic consistency, measuring 1cm×1cm respectively. The masses were connected to the proximal and distal nerve fibers. The lesions were dissected from the nerve fibers and totally removed. The postoperative course was uneventful.

Histopathological report revealed spindle cells with occasional nuclear palisading (Antoni A pattern) and myxomatous cells changes (Antoni B pattern) and positive staining for S-100 protein and it was diagnosed as a schwannoma (Fig. 3). No recurrence occurred after 32 months of follow-up.

**Discussion**

The present case is a schwannoma causing occipital neuralgia. The original nerve was identified with preoperative MR neurography. While schwannomas are frequently seen in head and neck region (25–45%), it is rare in suboccipital region [1, 2]. As far as we are aware, only 5 cases of greater occipital nerve schwannoma were reported [3–5]. All of them were, however, diagnosed as a greater occipital nerve schwannoma not with the original nerve, but with simply the location. This is the first case whose the original nerve of a greater occipital nerve schwannoma was identified with pre-operative MR neurography.

Occipital neuralgia is a common and sometimes debilitating condition caused by compression, entrapment, or stretching of the occipital nerves. The etiologies of occipital neuralgia were reported such as trauma, cervical spine abnormality and tumor. Osteochondromas, neuromas and multiple myelomas were reported as the cause of occipital neuralgia [6]. Although there are few reports of greater occipital nerve schwannomas, the benign tumors must be kept in mind in the differential diagnosis of patients with occipital neuralgia since they are surgical treatable like the present case.

MR neurography has been shown to have excellent anatomic capability due to the rapid improvements in coil technology and software [7]. With the advancements, it has been possible to follow the peripheral nerve tracts. In the present case, we detect the tumors connected the proximal nerve from C2 cervical nerve posterior fibers. The findings contributed to preoperatively diagnose the tumors as a greater occipital nerve schwannoma. It is extremely useful to diagnose and make a preoperative plan. The further developments of MR neurography are anticipated.

**Conclusions**

We reported a schwannoma causing occipital neuralgia. The original nerve was identified with preoperative MR neurography. The case is instructive in terms of not only a rare case but also the following of the original nerve with MR neurography.

**Abbreviations**

MR
magnetic resonance
MRI
magnetic resonance imaging.

**Declarations**

**Ethics approval and consent to participate**

Written informed consent was obtained from the patient for publication of this Case report and any accompanying images.

**Consent for publication**

Written informed consent was obtained from the patient for publication of this Case report and any accompanying images

**Availability of data and materials**

All data is contained in the present manuscript.

**Competing interests**

The authors declare that they have no competing interests.

**Funding**

None.

**Authors’contributions**

KN and MO acquired the data and drafted the manuscript. HY drafted the pathology section. SN, KM, KI, MI and YN revised critically the manuscript. All authors read and approved the final manuscript.

**References**


Figures

Figure 1

Magnetic resonance imaging showed that the lesions were not suppressed on 3 dimensional T2 weighting with fat suppression (arrow).
Figure 2

Three dimensional fusion images (3 dimensional T2 weighting with fat suppression and 3-dimensional computed tomography) clearly revealed the original nerve (C2 cervical nerve posterior fibers) of the lesions.
Figure 3

Histopathological examination showed spindle cells with occasional nuclear palisading (Antoni A pattern) and myxomatous cells changes (Antoni B pattern) and positive staining for S-100 protein (×10).