

Inflammatory Pseudotumour of Skull Base – Diagnostic Challenge and Treatment Outcome

Kahairi Abdullah, MBBS, MMed (ORL-HNS), Ahmad Raja Lope, MD, MS (ORL-HNS), Wan Ishlah Leman, MD, MS (ORL-HNS), Norra Harun, MD, MPath

International Islamic University Malaysia, ORL-HNS, Jalan Hospital, Kuantan, Pahang 25100 Malaysia

SUMMARY

We report a case of an inflammatory pseudotumour (IP) involving the floor of the skull base, which demonstrated aggressive behavior both clinically and radiologically. In this case, the diagnosis was established by clinical presentation, magnetic resonance imaging (MRI), histopathological examination (HPE) and the dramatic response towards high dose steroid therapy. The clinical features improved with oral cyclophosphamide in combination with oral steroid, which were given for a period of three months.

KEY WORDS:

skull base, head and neck, steroid

INTRODUCTION

Inflammatory pseudotumour (IP) involving head and neck area is rare and to have it involve the skull base, orbit, temporal bone, infratemporal fossa and parapharyngeal region at almost the same time is indeed unusual. Due to its rarity, establishing a correct diagnosis was a great challenge to the physician and surgeon, this was further complicated by the multiple sites of involvement in the head and neck area. Delay in diagnosis may result in significant morbidity to the patient as will be illustrated in this case. A multidisciplinary approach and consultation from otolaryngology, neurology, neurosurgery, histopathology and oncology units was important in managing this rare case.

CASE REPORT

A 20 year old lady presented with intermittent left sided headache since the past three years. Her headache increased in severity two months prior to her visit, and it was associated with occasional vomiting, reduced vision of her left eye, photophobia, left aural tinnitus, hearing impairment, otalgia and left facial numbness. However, there was no history of vertigo. Cranial nerve examination showed impaired function of the left 2nd, 5th and 6th cranial nerves. Otolaryngological examination of the ear was normal. A review by an ophthalmologist revealed a swollen optic disc in her left eye and visual acuity was only counting fingers. An urgent MRI was performed with findings suggestive of an intracranial lesion, but the features also suggested it could be left mastoiditis with left temporoparietal meningoencephalitis and the possibility of left cavernous sinus thrombosis. In view of these findings, she was started on

intravenous antibiotic therapy. Despite two weeks on systemic antibiotic, she still had persistent headache and subsequently underwent mastoid exploration, the indication being a suspected left masked mastoiditis with an intracranial extension. Left cortical mastoidectomy was performed, which showed only minimal granulation tissue occupying the mastoid cavity and mastoid antrum, and tissue was sent for histopathology. Her headache and vision improved significantly after the surgery and she was discharged well a few days later. At one month follow up she only had mild, intermittent headache and diplopia, and her left eye vision was almost normal. Her condition remained status quo until about 7 months later when she came back with a complaint of severe headache, but this time she had diplopia when looking toward the right side. This was associated with blurring vision of her right eye.

Examination revealed right 6th nerve palsy with almost complete recovery of her previous left 6th nerve palsy. An urgent MRI of the orbit and brain was performed and showed a thickened and enhanced left cavernous sinus with bulging of the right cavernous sinus. The dura surrounding the left temporal lobe and left tentorium cerebelli were also enhanced (Figure 1). This enhancement was extending into the left infratemporal fossa and parapharyngeal region. The right and left distal optic nerves, optic chiasma and the pituitary stalk were all enhanced. However, the extra ocular muscles appeared normal and symmetrical. With all these features, the interpretation made by radiologist was that of an inflammatory pseudotumor involving the skull base. At this point, judging from the clinical manifestations as well as the MRI results, a chronic inflammatory process was considered as the main underlying pathology and she was given an intravenous (iv) dexamethasone 8 mg three times a day for three days. She responded well to treatment with improvement of her symptoms. She was discharged with a tapering dose of tablet prednisolone started with 20mg twice a day doses. She was well until about eight months later, when she was admitted with severe headache associated with nausea and vomiting, diplopia (on looking toward the right side) and this time she had hoarseness. Flexible nasopharyngolaryngoscopy (FNPLS) examination revealed left vocal cord palsy. Again, she showed a dramatic response towards the steroid except for the hoarseness. Since then, she had repeated admission almost once in two or three months with a similar complaint of headache, diplopia and hoarseness. On each admission, iv dexamethasone was given

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*Corresponding Author: Kahairi Abdullah, International Islamic University Malaysia, ORL-HNS, Jalan Hospital, Kuantan, Pahang 25100 Malaysia
Email: kahairiabd@yahoo.com*



Fig. 1 : An axial T1 weighted post gadolinium image of the brain shows enhancement and thickening of the dura along the left temporal lobe (arrow).

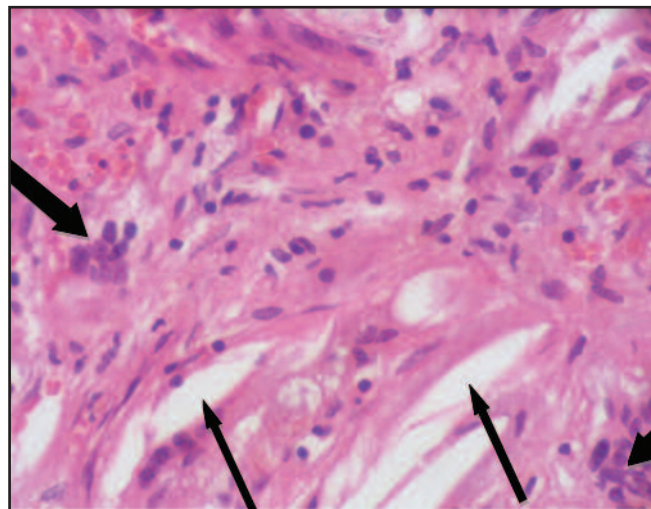


Fig. 2 : Haematoxylin and eosin stain (40 x magnification) image shows multiple multinucleated giant cells (thick arrow) and cholesterol cleft (thin arrow) with background fibrocollagenous tissue, plasma cells and lymphocytes.

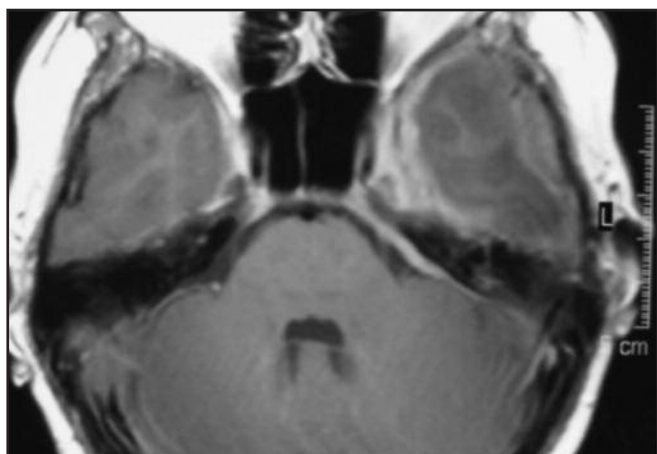


Fig. 3 : An MRI image taken at 3 months post treatment completion showed significant improvement of the lesion at left temporal lobe.

for 3 to 6 days and she was discharged with a reducing regime of prednisolone after her symptoms improved. Her only abnormal blood test was an elevated ESR (92mm/hr). Screening tests for tuberculosis were all negative. The tissue, which was sent for biopsy during mastoid exploration, was reported as fibrocollagenous tissue containing numerous cholesterol clefts infiltrated by lymphocytes, plasma cells, multinucleated giant cells with cholesterol granuloma (Figure 2).

Retrospective review and analysis of this patient's clinical manifestations, blood investigations, HPE report, radiological interpretation as well as responsiveness toward steroid and after excluding other possible differential diagnoses, inflammatory pseudotumor was considered as the main pathology. This case was discussed with an oncologist, and it

was decided that the patient be started with a combination of tablet cyclophosphamide 100 mg daily with tablet prednisolone 45mg daily on twice a day doses. The prednisolone was reduced at 5mg weekly, and the cyclophosphamide was continued with the same dose throughout. After three months on cyclophosphamide, her total white cell count came down to $2.8 \times 10^8/L$ from the initial level of $8.3 \times 10^8/L$, and it was decided to discontinue the cyclophosphamide as almost all of her symptoms disappeared except for mild hoarseness. Three month after treatment completion, she remained asymptomatic except for hoarseness and repeat MRI (Figure 3) showed significant improvement of the lesion. At 12 months follow up after the cessation of treatment, her voice was back to normal and she was able to resume her usual normal life.

DISCUSSION

Inflammatory pseudotumour (IP) is an inflammatory lesion of unknown origin and it was first described by Birch-Hirshfield in 1905. It does not represent a single entity but rather a group of lesions which demonstrate non-specific chronic inflammatory changes¹. IP involving the head and neck area is rare and if it occurs, the orbit is the most common site involved. It is a rare occurrence that IP involved the skull base, temporal bone and parapharyngeal space but spares the orbit.

Making a diagnosis of IP in head and neck region may pose a challenge to the head and neck surgeon. Many differentials need to be considered, and granulomatous disease cannot be overlooked particularly in this part of the world, mainly attributed by tuberculosis. However, in this case it has been ruled out by the tuberculosis screening. Meningioma is another possibility, and it may also improve with steroid as in this case, but parapharyngeal involvement is very unlikely

in meningioma. Lymphoma of the skull base can show almost the same clinical manifestations and similar excellent response toward steroid, but routine blood investigations did not clearly suggest lymphoma apart from the tissue biopsy.

Biospy can be challenging as the lesion typically involves an area which is difficult to access such as in the central skull base or retroorbital area. Probably for this reason, Ahn Yuen et al only did a biopsy in 29% of their cases (n=65) and when only the patient came with atypical presentation or in cases who failed to respond to the steroid therapy². However, if IP involved in the lateral skull base area such as infratemporal fossa, biopsy was obtained most of the time via a transcervical approach³. In our case, biopsy was obtained via a mastoid exploration procedure for a presumed masked mastoiditis with an intracranial extension.

There is no consensus regarding the management of IP in head and neck area. However, some of the reported cases have shown a positive response towards high dose steroid therapy alone³. The respond toward steroid is so rapid that the administration of steroid often considered as a diagnostic test, but Mombeart et al. (1996) has cautioned that such a method of diagnostic evaluation has only 78% sensitivity⁴. Therefore in our case, the diagnosis was made based on clinical presentations, MRI, HPE report and the response toward high dose steroid and also after excluding other possible diagnosis. Radiotherapy in combination with chemotherapy has been reported to be useful in orbital IP, but for extraorbital IP, reports are limited. Surgery was also reported as one of the treatment options and is mainly contemplated in IP involving paranasal sinuses with or without combination with steroid and cyclophosphamide⁵. In the above case, significant improvement of symptoms after the mastoid exploration was probably due to the decompression effect of the surgery itself because no steroid was given at the initial stage. The use of cytotoxic agents in IP in combination with steroid has only been mentioned in

few reports, and agents frequently used were infliximab and cyclophosphamide³. In our case, surgery was obviously not a treatment option due to wide area of involvement at the skull base. Even though our patient has shown marked improvement every time she was started on high dose steroid, frequent recurrence of the disease has prompted us to combine the steroid with cyclophosphamide and this was done after seeking advice from an oncologist. However, the cyclophosphamide was withdrawn when the total white cell count came down to less than $3 \times 10^8/L$ and the steroid was also withdrawn concomitantly as almost all her symptoms disappeared except for mild degree of hoarseness.

In conclusion, inflammatory pseudotumour in head and neck area is a rare disease and delay in the diagnosis may significantly affect the patient's morbidity. In the above case, it took almost two years before complete recovery was achieved with the definitive treatment. Our single experience indicates that 3 month treatment with a combination of cyclophosphamide and oral steroid is adequate to control such an extensive disease and finally inducing complete remission. However, this cannot be used as a treatment guide as respond is varies between individuals. Oncologist advice and guidance is necessary to avoid complications of prolonged consumption of this cytotoxic drug.

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