

Post-Traumatic Meningioma

Post-Travmatik Meneñjiom

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Abstract

Various predisposing factors have been suggested in the formation of meningiomas originating from cap cells of arachnoids membrane, however head trauma is not included as an etiology. A 84 year old patient with new onset focal seizures secondary to right frontal meningioma was admitted to neurology clinic. His medical history revealed major head trauma with right frontal compression fracture which occurred 40 years ago. In this case report, the relationship between meningioma formation and head trauma is discussed.

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Key words: Brain tumors, trauma, skull fracture, meningioma.

Özet

Arañnoid dış zarındaki kap hücrelerinden köken alan menenjiomların etyolojisinde günümüze kadar birçok predispozan faktör öne sürülmüştür. Buna rağmen hangi faktörün ne kadar etkili olduğu bilinmemektedir. Travma bu etyolojik faktörlerden biridir. Bu olgu sunumunda, fokal nöbet geçiren, 40 yıl önce sağ frontal bölgede ağır kafa travması gerçekleşen ve kafa travması sonrası sağ frontal bölgede çökme kırığı gelişen 84 yaşında sunulmaktadır Bu olgu sunumunda; kafa travması ile menenjiom arasındaki ilişki açıklanacaktır.

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Anahtar kelimeler: Beyin tümörleri, travma, kafatası kırıkları, menenjiom.

Introduction

Various etiologies have been described in development of cranial meningiomas. Trauma is one of them. Harvey Cushing had described various meningioma types originating from meninges and he had suggested that trauma is a determinative factor in the formation of some meningioma types [1,2].

In %30 of trauma related meningioma cases head trauma history has been revealed. The relationship between trauma and meningioma has been tried to be explained by chronic inflammatory process triggered by foreign bodies seconder to head trauma, but it hasn't been certainly proved with this theory.

In this report we present a case with post-traumatic meningioma under right frontal compression fracture secondary to previous head trauma. The patient was admitted to the epilepsy clinic and had the history of serious head trauma 40 years ago.

Case Report

An eighty-four years old male patient was seen in emergency room with impairment in his general status and seizure. After stabilization of his general medical status, a cranial MRI (magnetic resonance imaging) was done. In the MRI (Figure 1), right frontal intracranial tumor lesion with the size of 6x6x7 cm with peripheral edema and subfalcián herniation was diagnosed. The lesion had also possessed cystic component and showed heterogeneous contrast enhancement. The patient was admitted to make further investigation and treatment.

According to the history that was taken from patient's relatives, his complaints were urinary incontinence, disorientation with and weakness of left lower extremity. Completing the medical history, we learned that he had had a cranial trauma 40 years ago and had been treated in neurosurgery intensive care unit for three months.

During surgery a right frontal craniotomy was performed. When the bone flap was removed, excessive fibrotic tissue and increased thickness

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of the dura in the fracture area was obvious. Dura was incised and meningioma was removed with CUSA (Cavitron ultrasonic surgical aspirator). Fibrotic and thick dura portions were also removed and then dura was closed with duraplasty using galeal graft. The patient was followed up in Intensive Care Unit postoperatively.

The pathological diagnosis of the material was atypical meningioma, grade II (Figure 2). The patient did not have any problems during hospitalization. He was discharged 2 weeks after the operation with physiotherapy program with no neurological sequela. The patient did not have any complaints in follow-up clinics.

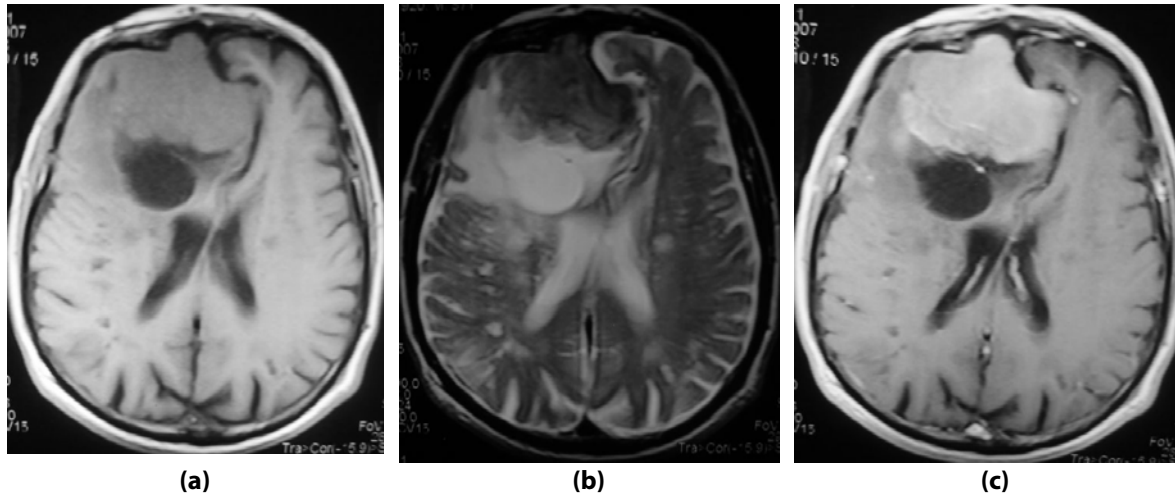


Figure 1. Preoperative T1-weighted (a), T2-weighted (b), and contrast-enhanced T1-weighted (c) MR images show right frontal mass.

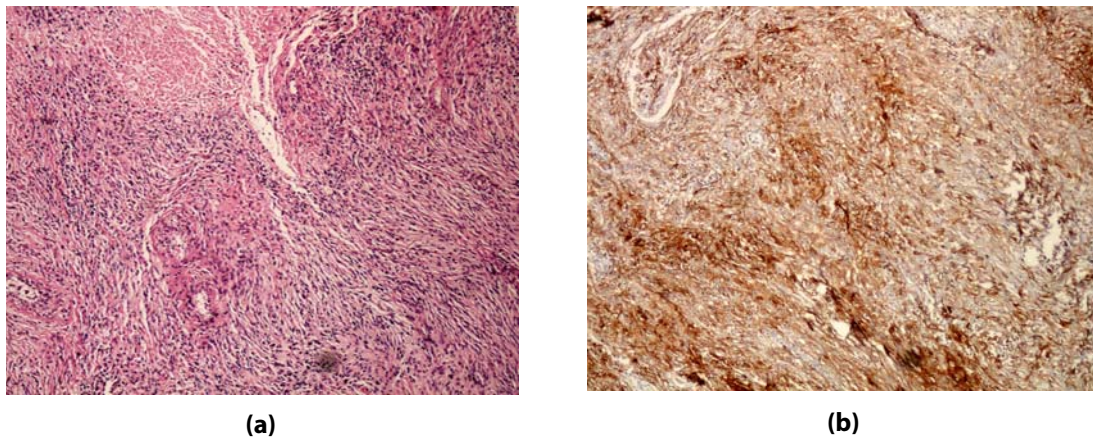


Figure 2. Pathological specimen showing (a) meningoendothelial cell and necrosis (haematoxylin and eosin x100), and (b) expression of the epithelial membrane antigen (+) (EMAx100)

Discussion

Meningiomas are benign and slow growing CNS tumors that originate from cap cells of arachnoid external membrane and may be aggressive via invasion to surrounding calvarium and cerebral tissue [3-6].

The cause of meningioma formation is mostly unknown [3,6,7]. Trauma, 22-chromosomal aberration, neurofibromatosis type 2, chronic viral infections, female hormones, immune suppression, radiation and drugs have been thought to be factors involved in meningioma formation [3,5-7].

The role of trauma in meningioma formation has not been exactly explained yet [5,6,8]. Firstly Harvey Cushing and Einsenhardt had reviewed the histories of 295 patients who had a history head trauma and found that 94 (%30) of the injuries were thought to be related to development of meningiomas [6]. Ojikutu [4] had told about olfactory groove meningioma after anterior fossa fracture. Artico et al [9] had shown in their study of 15 cases that cranial trauma could be the cause of meningiomas. Cervoni et al [10] also had reported a case that had intracranial meningioma in the area

of skull fracture. Shaw et al [2] had reported a scalp meningioma as a late complication of skull fracture in a case that had cranial trauma 16 years ago. Philipps et al [11] had shown the relationship between trauma and meningioma formation 10-19 years after the first head trauma in their population-based case-control study.

Contrary to that, other large studies do not support a link between head injury and later occurrence of a meningioma. In an epidemiologic study that consists of 2953 patients with cranial trauma, it was shown that there wasn't an increase in meningioma incidence after trauma [12]. In another retrospective case control study, 24 meningioma patients were compared with control group and it was reported that there was no difference in cranial trauma incidence between two groups [13].

The relationship between tumor formation and head trauma are explained with cellular atypia. Any etiological factor can cause chronic inflammation and this process can be a trigger factor to cellular atypia and tumor formation after head trauma. This mechanism is started by the arachnoid scar formation which causes chronic inflammation after serious head trauma. Foreign bodies, bone and inoculation of dermis lead to chronic inflammation and granulomatous reaction and this process results in cellular atypia. And then cellular atypia results in tumor. In our case trauma and tumor location were the same, meningioma had occurred after a particular time from the trauma and the theory of chronic inflammation caused by the bone material inoculated to intracranial compartment via foreign body reaction supports cellular atypia.

In tumor formation mechanism, a lot of factors are accepted to cause tumor formation by affecting the tissue continuously for a long time. So trauma is not the only etiologic factor that is responsible for meningioma formation [7].

As a result, although a lot of predisposing factors have been suggested in intracranial meningioma formation, it is still unclear that which factor how effects the formation. As it is seen in our case, meningioma formation under skull fracture due to trauma suggests that trauma may be a predisposing factor in meningioma formation in long time. But in this chronic process, other predisposing factors together with trauma may be effective to development the meningioma.

References

1. Kotzen RM, Swanson RM, Milhorat TH, Boockvar JA. Post-traumatic meningioma: case report and historical perspective. *J Neurol Neurosurg Psychiatry* 1999; 66: 796-8.
2. Shaw R, Kissun D, Boyle M, Triantafyllou A. Primary meningioma of the scalp as a late complication of skull fracture: case report and literature review. *Int J Oral Maxillo Fac Surg* 2004; 33: 509-11.
3. Schneider B, Pülhorn H, Röhrig B, Rainov NG. Predisposing conditions and risk factors for development of symptomatic meningioma in adults. *Cancer Detect Prev* 2005; 29: 440-7.
4. Russell DS, Rubinstein LJ. Pathology of tumours of the nervous system. 5th ed. Baltimore: Williams and Wilkins; 1989.
5. Claus EB, Bondy ML, Schildkraut JM, Wiemels JL, Wrensch M, Black PM. Epidemiology of intracranial meningioma. *Neurosurgery* 2005; 57: 1088-95.
6. Black PM. Meningiomas. *Neurosurgery* 1993; 32: 643-57.
7. Mirzai H, Akbaşak A, İşısağ A, Selçuki M. A case of posttraumatic intracranial meningioma. *Ulus Travma Acil Cerrahi Derg* 2004; 10: 257-9.
8. Hu J, Little J, Xu T, et al. Risk factors for meningioma in adults: a case-control study in northeast China. *Int J Cancer* 1999; 83: 299-304.
9. Artico M, Cervoni L, Carloia S, Palatinsky E, Delfini R. Development of intracranial meningiomas at the site of cranial fractures. Remarks on 15 cases. *Acta Neurochir* 1995; 136: 132-4.
10. Cervoni L, Celli P, Maraglino C, Caruso R, Gagliardi FM. Intracranial meningioma at the site of a previous cranial fracture: case report and review of the literature. *Ital J Neurol Sci* 1996; 17: 79-81.
11. Phillips LE, Koepsell TD, Van Belle G, Kukull WA, Gehrels JA, Longstreth WT. History of head trauma and risk of intracranial meningioma: population-based case-control study. *Neurology* 2002; 58: 1849-52.
12. Anselmi E, Valissa D, Berte E, Vanzo C, Cavanna L. Post traumatic glioma: report of two cases. *Tumori* 2006; 92: 175-7.
13. Bondy M, Ligon BL. Epidemiology and etiology of intracranial meningiomas: a review. *J Neurooncol* 1996; 29: 197-205.