Case Report

Right Sided Cavernoma Presenting With Cross Aphasia After Surgery

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Abstract

27 years old woman presenting with seizure was hospitalised. We have seen a single lesion in frontal lobe on MRI. After surgery the histopathological result confirmed with cavernoma. The most important finding after surgery was cross aphasia. Cross aphasia is the term used for patients with normal left cerebral hemisphere and using their right hands, presenting with aphasia due to lesions like tumor, trauma, vascular lesions on right cerebral hemisphere. Cross aphasia is a rare situation with an incidence 0.4%-2%. This situation is explained by projection of left hemisphere on right side. The right hemispheric dominancy with 4 % percentage causes this situation.

Keywords: Cavernoma, cross apasia, surgery

INTRODUCTION

Cavernomas or cavernous hemangiomas are non tumoral growing vascular malformations. They can be found in liver, spleen, and also anywhere in central nervous system. Their prevalence is not clear. In cadaveric studies their prevalence is found between 0.002% and 0.5%11. The 75 percentage of cavernomas are localised subcortically and supratentorially. They are mostly localised in frontal and temporal lobes. They mostly present with seizure, hemorrhage and neurological symptoms15.

Many problems can be seen in early and late post operative period of cerebral surgery. Hemorrhage, seizures, motor function deficits, visual deficits, motor and sensorial aphasia are some of these. Cross aphasia defined by Bamwell in 1899 can...
also be seen in group of aphasia. Cross aphasia is a type of aphasia with low prevalence and the main properties of this type are; it must be seen at people with lesions in right cerebral hemisphere and using right hands. It must be seen at people with normal left cerebral hemisphere and with no history of seizure and cerebral trauma in childhood. This type of aphasia can be seen in prevalence of 0.4% and 2%\(^3\). In early period of this type of aphasia the mostly affected function is fluent speaking. The most important property of this type of aphasia is that it is temporary. The reason of discussing this case is that this type of aphasia is a very rare occasion.

**CASE PRESENTATION**

A 27 year old right handed woman. She had a history of generalised seizure with loss of conscious three years ago. She has been hospitalised in neurology service. On radiological findings a lesion in right frontal inferior opercular gyri with subcortical presentation has been seen. The lesion was characterised with hyperintens presentation on T1(Figure 1) with little contrast enhancement(Figure 2). On T2 secanses of sagittal sections it looks as hypointens surrounded by hemociderine(Figure 3). No pathological finding has been seen on cerebral angiography. The patient has been sent to another medical centre for gamma knife. But we hospitalised the patient in our service for surgery because surgical invention was suitable for this case. We performed a right frontal craniotomy and removed the lesion totally. The lesion looked yellow and was surrounded by hemociderine. The histopathological findings confirmed with cavernous hemangioma (Figure 4). No other neurological finding except speech disorder was seen. The patient could not talk fluently for four months and in early period it was like cross motor aphasia. The patient was conscious. She could not write. In the following period she started to spell short words. After 4 months her cross aphasia totally recovered. We followed the patient for two years. She is still unable to find the words while speaking. She had no seizure after the operation. We did not see any lesion on control MRI(Figure 5).

![Figure 1: Slightly hyperintense on axial non contrast T1 images](image-url)
Figure 2: Slightly contrast enhancement in T1 contrasted axial plan

Figure 3: Hyper intense lesion surrounded by hypointensity in frontal opercular area in T2 axial images

Figure 4: Slightly contrast enhancement in T1 contrasted coronal plan

Figure 5: Cavernos hemangioma in cerebral paranchima is characterise with thiny and bloody(HE x100)
Cavernomas are benign lesions which are classified as vascular malformations of central nervous system. It is usually not possible to see them on angiography\(^5\). Their prevalence is not clear. In cadaveric studies they can be seen between 0.02% and 0.5%\(^{11}\). 75% of them are localised supratentorially and subcortically\(^{15}\). They are often localised in frontal and temporal region. The supratentorally localised ones often present with seizure, neurological deficit and intracerebral hemorrhage. The 25% of these patients present with headache and they are incidentally diagnosed\(^{1,11}\).

Cavernomas are vascular lesions and family history is found also in central nervous system like the ones seen in other organs. The hereditary lesions are usually multiple\(^{11}\).

Unlike arteriovenous malformations cavernomas are not the lesions with high pressured arterial feedings and large venous drainage. They often have little arterial feedings and large venous drainage\(^{14}\). Histopathologically they are vascular malformations seperated with dilated endothelial layers. There is no neural structure between these layers. The vascular structures are seperated by fibrocollagane\(^{14,10,5}\).

Cavernomas usually present with seizure. Although there are many studies about this there is a debate about treatment. If the patient has seizures resistant to medical therapy, has headache and neurological deficit the surgical indication is certain\(^{10}\). According to literature 43% of patients attend with generalised seizure\(^{11}\). And also the ones seen in frontal lobe cause more seizures than the ones seen in temporal lobe. These lesions are usually surrounded by gliosis, micro hemorrhage and hemociderine. This surrounding tissue which also contains free ionic iron seems to be releated with seizures\(^{15,6}\). According to the literature and also as seen in our patient the seizures can be 92% controlled and 84% clearly treated\(^{11}\). In our patient we did not see any seizures after surgery.

Aphasia is not only a problem about speaking it is also releated with cerebral damage. Aphasia due to right hemispheric lesion in patients who use their right hands is a very rare occasion. This is first described by Browell in 1899 and called as cross aphasia. Its prevalence is between 0.04% and 2%. The certain mechanism lying under this situation is not clear. There are many theories about this subject. No crossing of the tracts in corticospinal tract, sudden presenting left hemispheric lesion, family history and others may be some of these\(^8\).

Due to the region of lesion and type of speech two situations have been described. These are mirror projection and types of anomalies\(^2\). In mirror projection the right hemispheric lesion gives symptom just as the ones in left hemisphere. If the anomaly is as cross aphasia the symptoms are like the ones seen in left hemispheric lesion. But it is not...
clear why the right hemispheric functions
cross to left hemisphere in cross
aphasia\(^{(13,8)}\). Osio and friends have seen
temporary aphasia periods in a case of
right frontal localised tumor and they have
performed Wada test and brain mapping.
As they have seen the stimulation of
inferior frontal cortical electrode in brain
mapping they have described this as mirror
projection of left hemisphere on right
hemisphere\(^{(12)}\).

The studies about cross aphasia can be
performed by certain assesments of
patients functions like writing, drawing,
repeating, calculating and by Wada test,
invasiv cerebral mapping and functional
magnetic resonance imaging\(^{(4,7)}\). In a
recent study it has been found that the
prevelance of right hemispheric dominance
in right handed people is about 4%\(^{(9)}\).

In our case we decided that the aphasia
seen in our patient was matching with
motor cross aphasia because the symptoms
of the patient were, she was unable to talk,
write, calculate and repeat but clear
understanding was good. And also as we
mentioned before because of right
hemispheric disfunction it was belonging
to mirror group. We could not perform
functional MRI.

As we described this rare occasion to
parents of the patient we decided to share
this case with our counterparts.

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