



ATTENTION DEFICIT HYPERKINETIC DISORDER WITH DISTAL ANTERIOR CEREBRAL ARTERY ANEURYSM. A RARE CASE

Neurosurgery

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ABSTRACT

Attention deficit hyperkinetic disorder (ADHD) is a chronic condition of childhood often continue into adulthood. This disease affects millions of children worldwide. ADHD had been associated with increasing incidence of traumatic brain injury (1). Trauma leading to such an aneurysm are rare, consist only 1% of all intracranial aneurysm (2). We report a case of 10 years old child suffering from ADHD develop traumatic distal anterior cerebral artery aneurysm following mild head injury.

KEYWORDS

Attention Deficit Hyperkinetic Disorder, Traumatic Distal Anterior Cerebral Artery Aneurysm, Pseudoaneurysm

CASE REPORT

10 years old male child diagnosed with ADHD since his childhood and was on medication. One month back he had history of fall from bed while playing with his brother and he also had an episode of head banging 15 days prior to this episode. He was a symptomatic till few days later then he started having intermittent dull aching headache which was relieved with medication. Headache gradually progressed and present throughout the day for which he consulted the local doctor and advised him computed tomography of head which shows well defined hyperdense lesion with surrounding rim of calcification in interhemispheric fissure. Then magnetic resonance imaging was done showing well defined T2 hypointense lesion in midline inferior to falx without contrast enhancement and surrounding edema. After few days computed tomography angiography was done showing saccular aneurysm arising from left pericallosal artery with calcified wall. Patient presented to us in conscious alert status without any neurological deficit. Neuronavigation guided computed tomography was done before operation. Left parasagittal craniotomy was made. Interhemispheric approach was taken. Proximal and distal control was taken. Aneurysm seen arising from pericallosal artery 3-4 cm distal to bifurcation. Aneurysm neck found to be thick and calcified. Temporary clip was applied and dome of aneurysm was opened. Thick and calcified portion of wall was removed and permanent clip was applied. After operation patient become conscious alert without any sensory and motor deficit and discharge in same status. Histopathology report suggestive of pseudoaneurysm.

DISCUSSION

ADHD is a heterogeneous behavioural syndrome characterized by maladaptive levels of hyperactivity, impulsivity and inattention. ADHD symptoms starts mainly in childhood as early as 3 years, most of the patients become symptomatic by age of 12 years. Prevalence of ADHA in India is 12.3% with male to female ratio is 3:2 (3). ADHD further divide into three subtypes 1) predominantly inattentive 2) predominantly hyperactive-impulsive 3) combined type. Diagnosis of ADHD is based on history, full clinical assessment and meeting of DSM-IV criteria. Karic et al had found that severe ADHD patients has more chances of mild traumatic head injury in compared to mild ADHD (2). Various article in literature showing increase rate of traumatic brain injury in these patients (4,5). No literature has been published regarding traumatic aneurysm in these patients.

Traumatic brain aneurysm represented 33% of all the aneurysm presented in pediatric patients (6). DACA is the most common artery involved in traumatic brain injury followed by internal carotid artery and distal branches of middle cerebral artery (7). Traumatic brain aneurysms were commonly seen after closed brain injury as this mechanism of injury is the most common followed by missile, penetrating and iatrogenic injury.

Clinical presentation of most traumatic brain aneurysm varied from mild headache to sudden death. Most of the patients presented with subarachnoid hemorrhage or intraparenchymal hemorrhage. Average time between trauma and hemorrhage is 21 days (8). Sometimes symptoms related to primary brain injury masked the early symptoms often led to delayed diagnosis of this condition (9). Pathologically most of traumatic brain aneurysm are of three types 1) true 2) false and 3) mixed. False aneurysms are more common in comparison to rest of the types.

High index of suspicion is required in all head injury patients especially in those patients who presented with delayed onset hemorrhage or uncontrolled hemorrhage while removal of intracranial hematoma (10). Conventional cerebral angiography is the gold standard investigation for intracranial aneurysm but due to invasive nature of this investigation most avoid doing it as first investigation. computed tomography angiography is less invasive and require very less time to perform so remain first investigation of choice. Most neurosurgeon preferred to perform angiography after 14 days of trauma as aneurysm require some time to grow (11).

The goal of treatment is exclusion of aneurysm from circulation either by clipping or neurovascular intervention of the aneurysm. Clipping of aneurysm is treatment of choice where traumatic aneurysm was associated with intracerebral hematoma or direct neurovascular intervention is not possible. Neurovascular intervention are increasingly being used modality for this condition, as it avoid prolong anesthesia and minimal vessel and brain handling (12).

CONCLUSION-

All the children and especially those who are suffering from Attention deficit hyperkinetic disorder are prone to develop traumatic aneurysm. Any patient present with intracranial, subarachnoid hemorrhage or delayed onset headache and neurological deficit following trauma should be thoroughly investigated and treated adequately if such aneurysm are seen upon work up.

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CONFLICT OF INTEREST- No

REFERENCES

1. Benoit BG, Wortzman G: Traumatic cerebral aneurysm clinical feature and natural history. J Neurol Neurosurg psychiatry 1973; 36 : 127-138.
2. KaricS, DesRosiers M, Mizrahi B, Zevailos J, Rodriguez P, Barengo NC: the association between attention deficit hyperactivity disorder severity and risk of mild traumatic brain injury in children with attention deficit hyperactivity disorder in the united states of America: a cross sectional study of data from the national survey of children with special health care needs. Child Care Health Dev 2019 sep; 45(5) : 688-693
3. Ajinkya S, Kaur D, Gursale A, Jadhav P: Prevalence of parent – rated attention deficit hyperactivity disorder and associated parent- related factors in primary

- schoolchildren of navi Mumbai-a school based study 2013; 80 : 207-210.
4. Grigorian A, Nahmias J, Dolich M, Barrios C, Schubl S D, Sheehan B et al: increased risk of head injury in pediatric patients with attention deficit hyperactivity disorder. *J Child Adolesc Psychiatr Nurs* 2019;1-6
 5. Cook NE, Kelshaw PM, Caswell SV, Iverson GL: children with attention –deficit/ hyperactivity disorder perform differently on pediatric concussion assessment. *J Pediatr* 2019;214:168-174
 6. Ventureyra EC, Higgins MJ: Traumatic intracranial aneurysm in childhood and adolescence, case reports and review of the literature. *Childs Nerv Syst* 1994;10: 361-379.
 7. Raju BS, Purohit AK, Murthy SR, Sundaram C, Sanjay T: traumatic distal anterior cerebral artery aneurysm in a child: a case report. *Neurol India* 2001;49: 295-298.
 8. Bhaisore KS, Behari S, Godbole C, Phadke RV: traumatic aneurysm of the intracranial and cervical vessel: a review. *Neurol India* 21026; 64: 14-23.
 9. Policicchio D, Muggianu G, Dipellegrini G, Broccaletti R: delayed diagnosis of post traumatic aneurysm of distal anterior cerebral artery. *Surg Neurol Int* 2018;9: 222
 10. Larson PS, Reisner A, Morassutti DJ, Abdulhadi B, Harpring JE. Traumatic intracranial aneurysms. *Neurosurg Focus* 2000;8:e4
 11. Aarabi B. Traumatic aneurysm of brain due to high velocity missile head wounds. *Neurosurgery* 1988;22: 1056-63
 12. Mao Z, Wang N, Hussain M, LI M, Zhang Q, Zhang P, Zhi X, Ling F. traumatic intracranial aneurysm due to blunt brain injury- a single centre experience. *Acta Neurochir* 2012;154:2187-93