

MIDDLE CEREBRAL ARTERY PSEUDOANEURYSM POST GUN-SHOT WOUND

Patchrin PEKANAN¹, Thitiporn RANGSITPOL^{1,2},
Wiwatana THANOMKIAT^{1,3}, Sapon KUMPOLPUNTH¹.

ABSTRACT

A pseudoaneurysm of the genu of left middle cerebral artery was demonstrated by i.v.enhanced CT scan and by left carotid angiography after a gun shot wound in a 31 year-old man. The contrast leak was seen at the angiographic injection. The active bleeding was noted in the unenhanced CT brain scan. The traumatic pseudoaneurysm of the middle cerebral artery was considered rare.

INTRODUCTION

Intracranial vascular injury could result in post-traumatic brain infarction, pseudoaneurysm, arteriovenous fistula, and venous thrombosis (1). Intracranial pseudoaneurysm are relatively rare after head injury in adults (1,2). In children, it is reported to account for 11% of all pediatric cases of aneurysm (3). The traumatic pseudoaneurysms have a propensity to hemorrhage. It can develop immediately or over a period of months to years. The most common time for presentation is 2 to 8 weeks after trauma.

CASE REPORT

A 31 year-old male patient was shot at the left part of the head and the bullet came out from his right cheek. The incident occurred on December 24, 1994. The clot was removed from his left cerebral hemisphere at a private hospital. He was referred to the Ramathibodi Hospital on December 27, 1994 with good consciousness. He was confused on that night with right hemiparesis. The consciousness was

deteriorated progressively. On January 1, 1995. CT scan was performed and showed a round enhanced focus at the anterior left temporal lobe within the surrounding contusive hematoma (Fig. 1). Left carotid angiography was thus proceeded and showed contrast leakage from left middle cerebral artery at the genu area of this vessel.

Craniotomy was performed but the bleeding could not be controlled and left common carotid artery ligation was performed. A pseudoaneurysm was found at genu of left middle cerebral artery. The patient, however, did not survive.

DISCUSSION

Development of a false saccular aneurysm is usually secondary to a disruption in the continuity of the arterial wall. A periarterial hemorrhage forms and is contained by the fascia. During systole, arterial blood pressure forces blood into the periarterial region. Blood accumulates at the site of the leak until the extra arterial pressure equals the mean arterial pressure. During diastole blood tends to return into the vessel

¹ Department of Radiology, Ramathibodi Hospital, Rama 6 Street, Bangkok 10400, Thailand.

² Department of Radiology, Phrapinklao Hospital, Bkk.

³ Department of Radiology, University of Songklanakarin, Songkla.

lumen. The periarterial hemorrhage clots and then retracts. The center of the clotted hematoma becomes cavitated and thus communicates with the arterial lumen. The fibrotic reaction produced in the surrounding tissues forms a wall of the pseudoaneurysm (6).

On angiography, a traumatic pseudoaneurysm frequently has an irregular contour and a wide or nonexistent aneurysmal neck. This is because the wall of the aneurysm actually represents an encapsulated hematoma in communication with the artery. Occasionally, the adventitia remains intact. Therefore, the wall of the pseudoaneurysm offers little structural support unless it is surrounded by firm structures such as bone, ligaments, or dura. A pseudoaneurysm can spontaneously thrombose and even calcify in the chronic phase. Angiography underestimates the true size of a partially or totally thrombosed aneurysm because it visualizes only the patent lumen. The opacified portion of a partially thrombosed aneurysm can be considerably smaller than the size of the mass that is seen on CT and MR images (1).

Burton (7,8) classified the traumatic aneurysms according to the type of vascular trauma and the type of aneurysm produced, grouped as follows:(a) true aneurysm-partial dilatation resulting from partial disruption of the arterial wall (b) false aneurysm-cavity of an encapsulated hematoma communicating with the lumen of the artery (c) mixed aneurysm-caused by rupture of the true aneurysm giving rise to a secondary false aneurysm.

Post traumatic aneurysms can enlarge rapidly. As in our case, the false aneurysm appeared 7-8 days after trauma. MRI immediately after the shot wound revealed no aneurysm.

The location of a pseudoaneurysm is related to the path of penetrating trauma, the vascular suspensory points of the brain, and vascular contiguity with the edges of the dura (1,4). Although traumatic pseudoaneurysms of the ICA usually involve the cavernous segment, the supraclinoid, intrapetrous, and upper cervical segments can also be affected. A pseudoaneurysm in these locations is frequently associated with an anterior basilar skull fracture.

When the common carotid artery or the lower cervical portion of the ICA is injured, the cause is usually a gunshot wound or blunt trauma to the neck (9). Branches of the ACA, especially the callosomarginal and posterior internal frontal arteries, can be injured because of their close relationship to the falx and corpus callosum. More proximally located traumatic pseudoaneurysms of the MCA and PCA are extremely rare (1). Traumatic pseudoaneurysms occasionally involve the peripheral cortical vessels or the meningeal vessels secondary to penetrating trauma or an adjacent skull fracture (7). A MCA pseudoaneurysm has been reported to follow needle puncture aspiration of a subdural hematoma (5). A skull fracture can also result in a pseudoaneurysm of an extracranial vessel, especially the superficial temporal artery.

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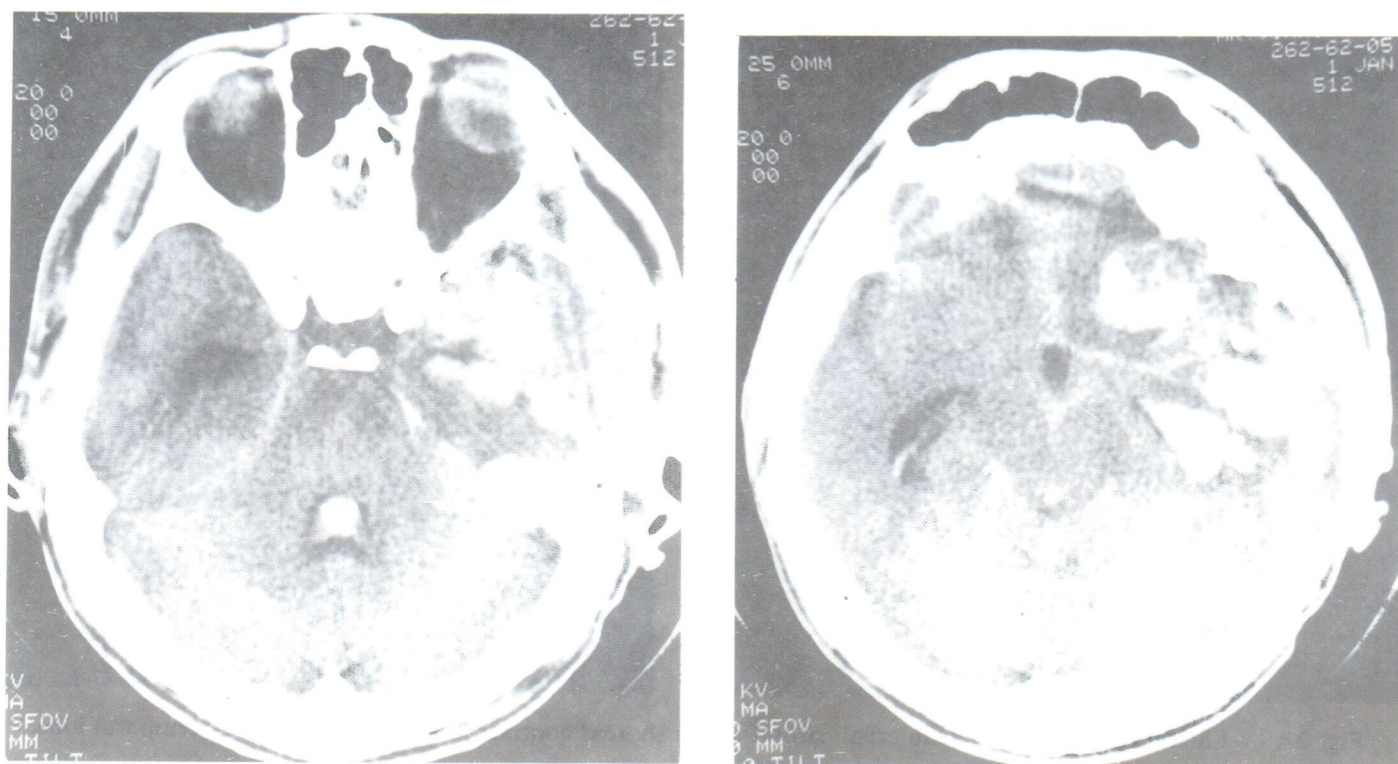


Fig. 1A Non contrast CT scan of the brain showed contusive hematomas at left temporal lobe; a left parietotemporal craniotomy was done.

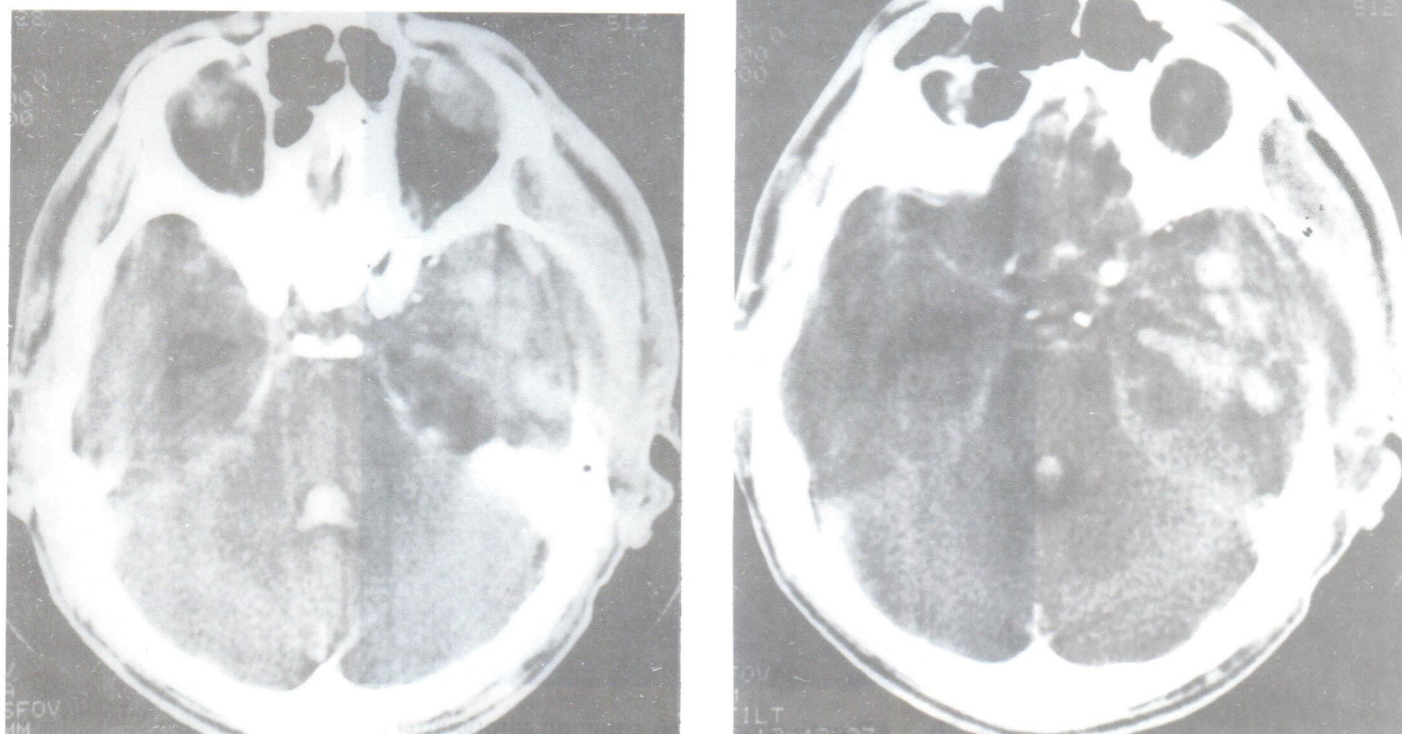


Fig. 1B Post contrast CT scan of the brain showed a nodular enhancement at the mid anterior left temporal lobe.

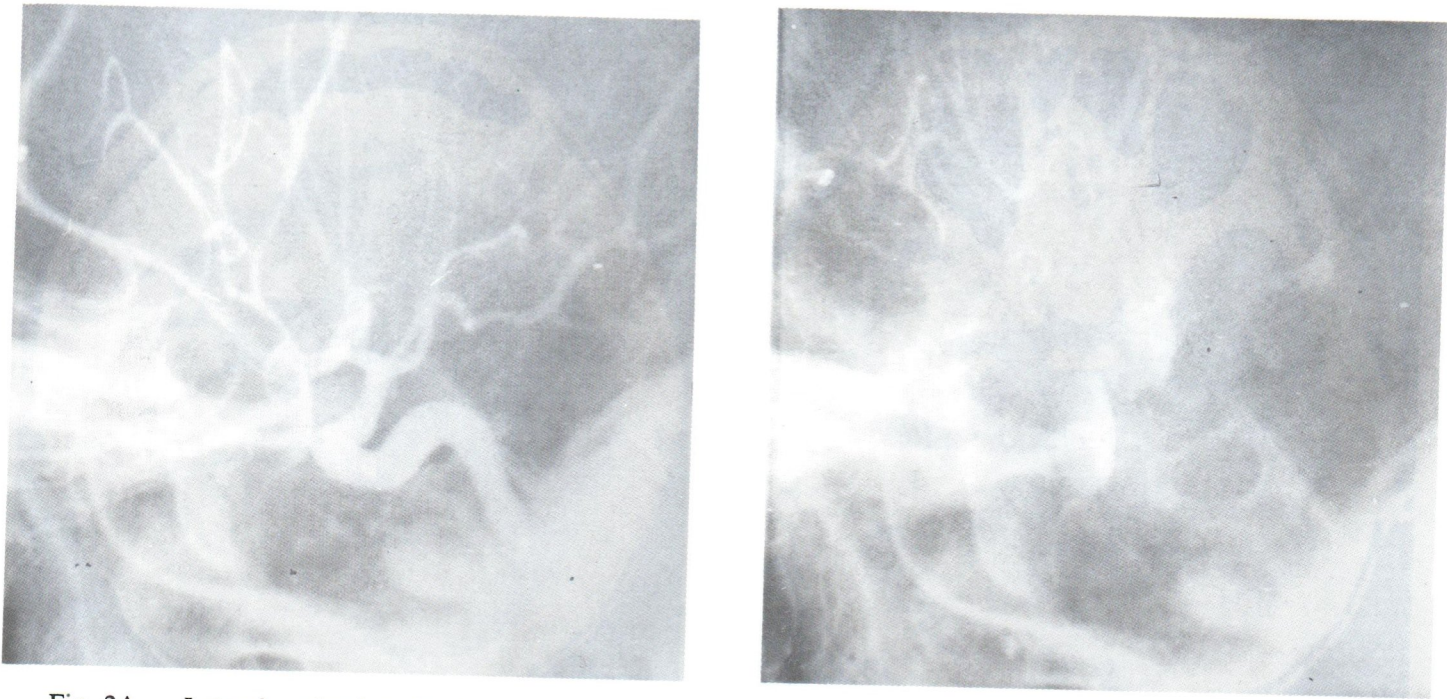


Fig. 2A Lateral projection of left internal carotid artery showed contrast leakage at left anterior temporal lobe.



Fig. 2B. AP projection of left common carotid artery injection showed narrowing lumen at around genu portion of left middle cerebral artery.

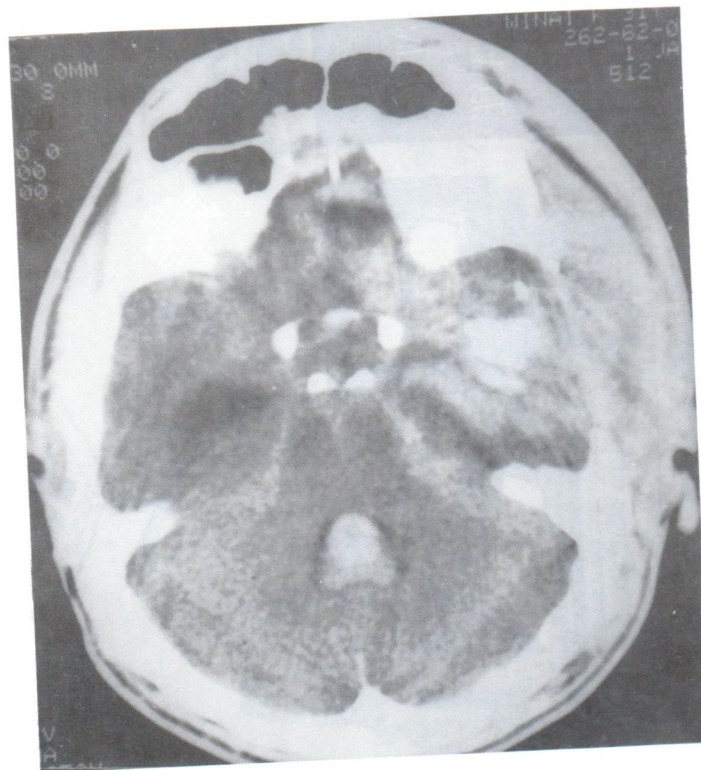
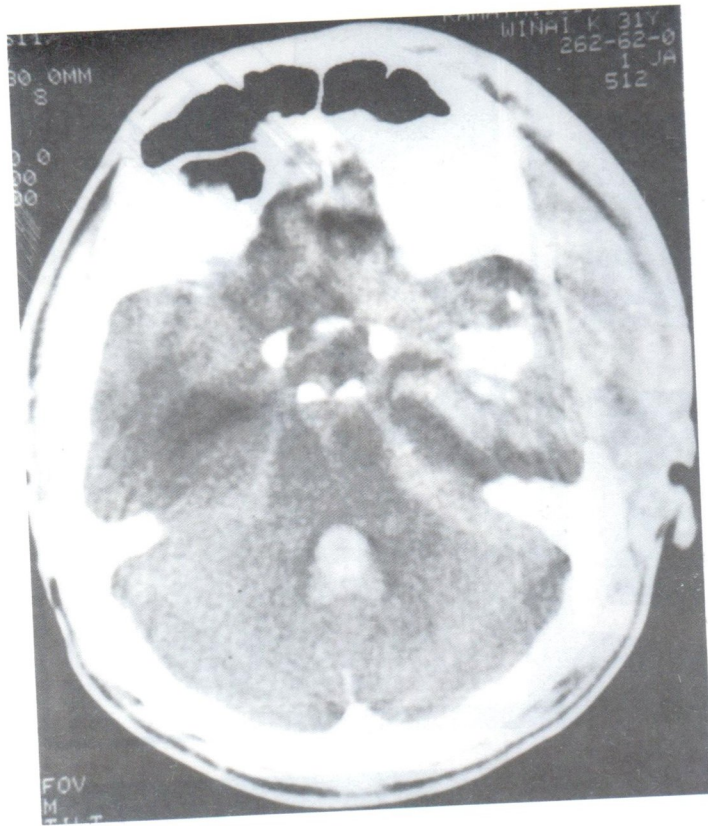


Fig. 2C Dense contrast leakage was shown by post angiographic CT scan at left temporal lobe.