Endovascular Embolization of Taumatic Intracavernous Pseudoaneurysm of Internal Carotid Artery

Tanveer Ul Haq,Shahzad Ahmad Khan,Imtiaz Hussain Rizvi (Department of Radiology, The Aga Khan University Hospital, Karachi.)

Delayed epistaxis after head trauma is a common presentation of' pseudoaneruysm, which should be investigated[1-4]. Traumatic pseudoaneurysm of the intracavernous ICA is a rate condition resulting from fracture base of the skull[5]. gunshot injuries to head or after surgery on pituitary fossa or sphenoid sinus. The pseudoaneutysni arises at the i nfrac I inoid port ion proximal to opthalmic artery and may reach such dimensions as to occupy the sphenoid and ethmoid sinuses. Pulsating pseudoaneutysi'n with tear of dural coverings may rupture into the sphenoid sinus or nasal cavity and cause massive epistaxis. It can he fatal in 50% of the cascs if left untreated. Latent period may be few days to many years. Definitive diagnosis is by angiography and treatment is either surgical or endovascular.

Case Report

A 28 years old tiiale with a history of a gunshot injury to his right eye and nose 75 days earlier came to Aga Khan Hospital. He was operated outside and few pellets were removed from his right orbit. He lost his right vision and in the following days had three episodes of massive epistaxis for which nasal packing was applied. The physical examination was unremarkable except loss of vision of the right eye and bruise around right orbit. Netirological examination was also normal.
Carotid angiogram showed 5x4 cm size aneurysm arising from intracavernous portion of right internal carotid artery. The aneurysm was bulging anteriorly and downwards eroding the sphenoid sinus and base of the skuIl; projecting into the nasopharynx (Figure 1).

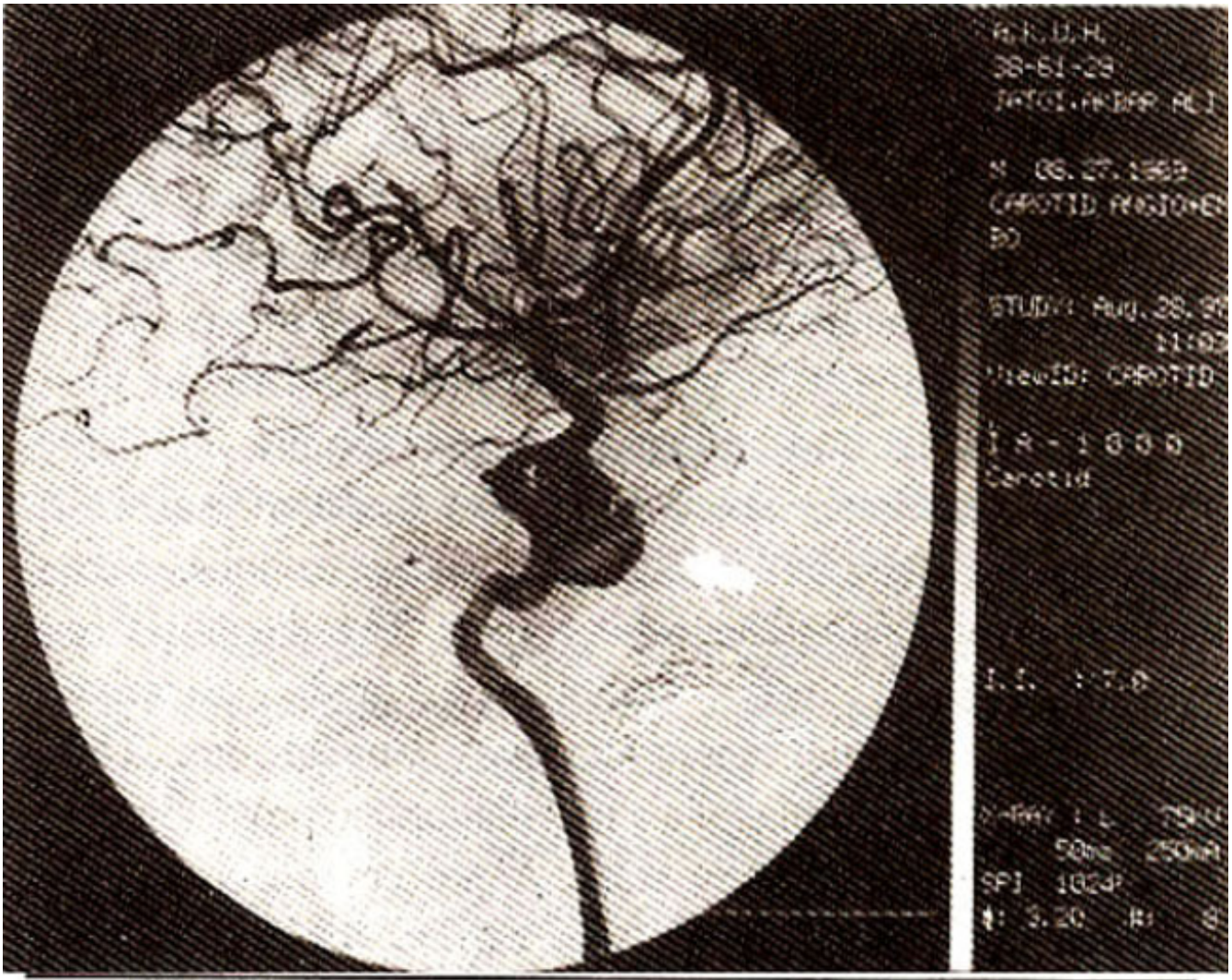

Figure 1. Right ICA angiogram showing large pseudoaneurysm arising from cavernous portion of ICA and projecting anteriorly into nasopharynx (white arrow).

The internal carotid artery above and below the aneurysm was unremarkable. Few bullet fragments were seen adjacent to the aneurysm and in the orbital apex. The diagnosis of pseudoaneurysm was established and selective embolization of the aneurysm was carried out. The procedure was performed via a transfemoral approach in the interventional angiography suite. A pre embolization left common carotid angiogram was carried out with cross compression on the other side to establish good collateral supply. This was followed by selective right internal carotid artery catheterization and embolization by two 5 cm size coils which were placed at the neck of pseudoaneuiysm. Few coils were placed at the proximal part of ICA (Figure 2).

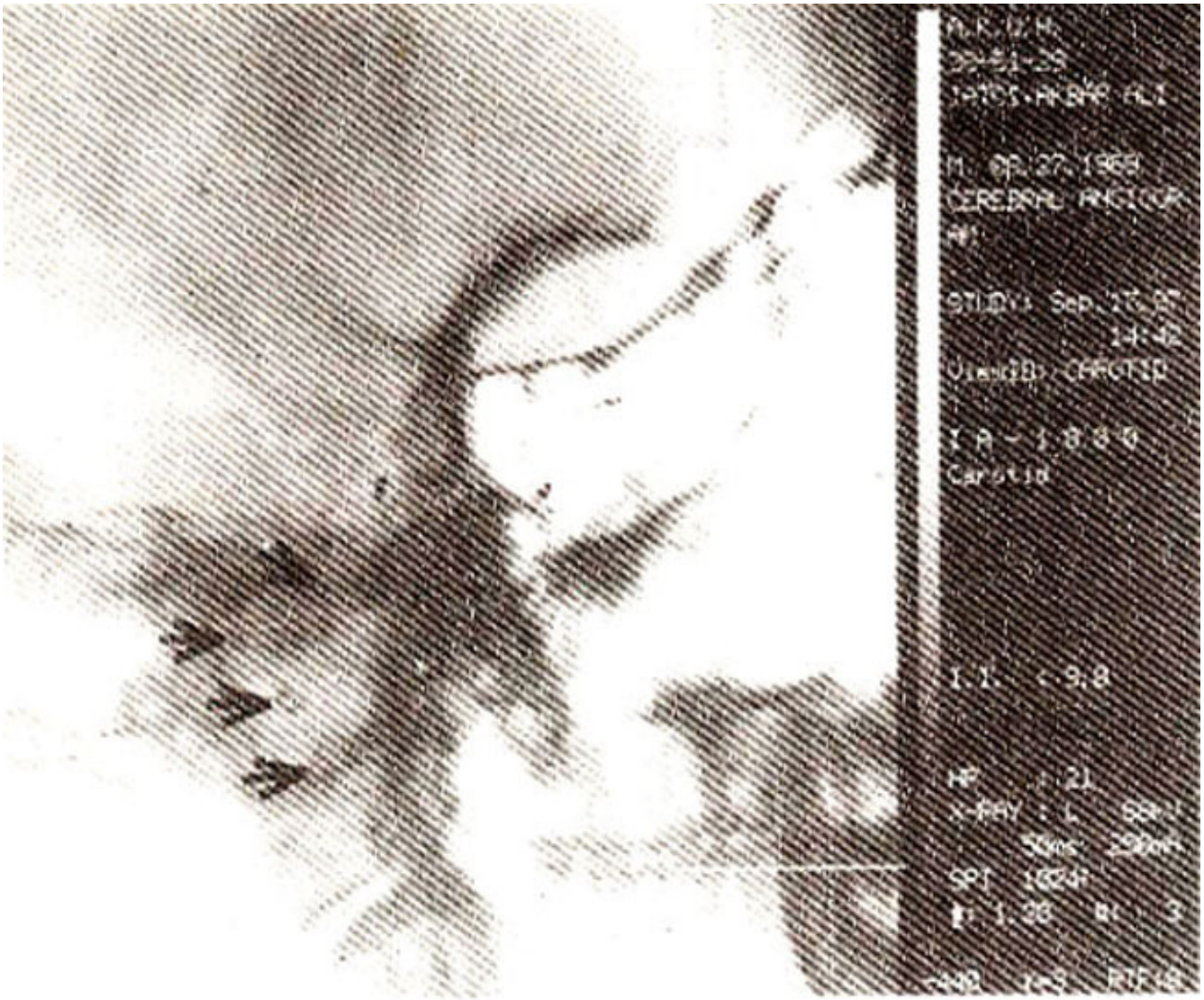

Figure 2 Steel coils (arrows) placed into right ICA.

Complete occlusion of aneurysm and ICA was accomplished (Figure 3)

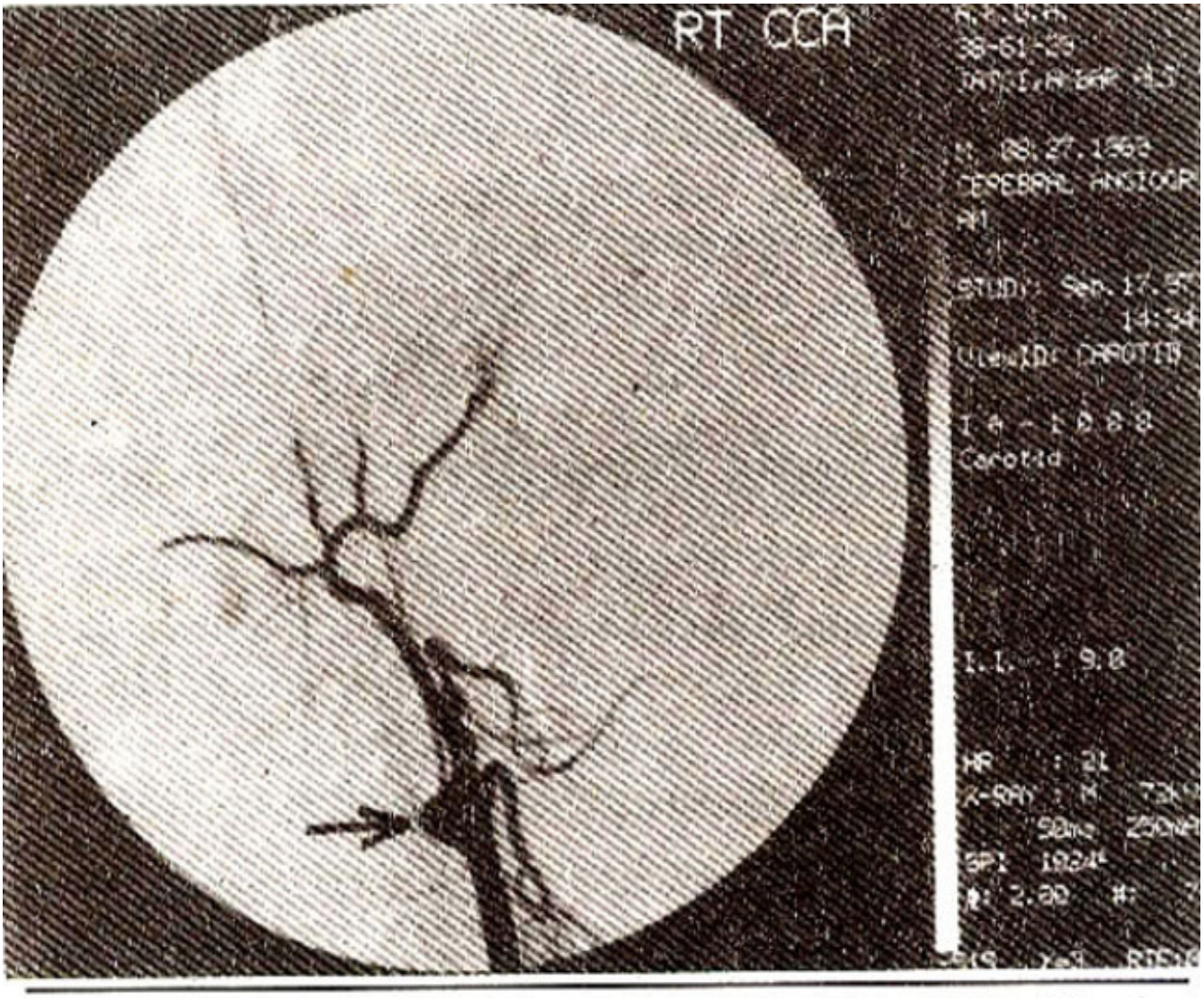

Figure 3. Post embolization right common carotid angiogram. Complete occulsion of ICA at its origin (arrow)

without any neurological deficit. Repeat left angiogram showed good tilling of right anterior and middle cerebral arteries by the anterior communicating artery. No post embolization complications were noted. Clinical Follow tip of the patient after three months revealed no problems.

Discussion

Traumatic aneurysms of the ICA due to gunshot injury are rare[3]. Three cases have been reported in the literature so far. Petty[6] was the first to report an aneurysm of the intracavernous part of internal carotid artery resulting from gunshot wound: trappine the aneurysm cured the patient. Most of these cases present with massive epistaxis and half of these hemorrhages are fatal[7]. Epistaxis occurs when the aneurysm ruptures into the sphenoid sinuses or directly into the nasopharyn x througl i basi Ia. skull fracture[8].

The initial episode of epistaxis is seldom fatal and recurrent bleeding becomes more severe with time. The initial mild epistaxis often heralds niassi ye epislax is that can lead to death. The latent period of massive epistaxis can very from few days to 8 months[1]. The classicial triad of unilateral blindness,

orbital fracture and massive epistaxis should alert for the presence of pseudoaneurysm. The cause of blindness is either direct trauma to optic nerve or ophthalmic artery or compress ion by surrounding haematoma Tamponade of the nasal cavity with a Foleys catheter or a special balloon catheter is a simple and useluil method of controlling the epistaxis[9]. The definitive diagnosis is made by angiography showing the outpouching, contrast filled aneurysmal sac from the ICA.

The treatment options For aneurysm of ICA are surgical ligation or application of clamps to the cervical internal carotid artery as described by, Drake[10], has been used in the treatment of pseudoaneurvsm but repeated hemorrhages due to collateral flow occurs in 55%. 'Frupping procedure whereby the cervical internal carotid artery is ligated, proximal and distal to aneurysm. lradication of aneurysm by e lectro thrombotic coagulation. Extracran ial - Intracranial Shunt: Anastomosing superficial temporal artery to a branch of MCA, where collateral circulation through circle of Willis is not intact.

Interventional neurovascular techniques utilizing detachable balloons to aid in the diagnosis and therapy of complex cerebrovascular disorders first described in the early 1970s have gained wide acceptance in the treatment of traumatic vascular lesions' Innovative endovascular techniques for occulsion of aneurysms with preservation of the parent artery have been developed and include the placement of fine metallic coils or detachable balloons into the aneurysm[12]. However there is a potential risk of rebleed due to fragile walls of aneurysm, which do not support the embolic device. Better results are when 1CA is blocked both proximal and distal to the aneurysm by coils or balloons[13], as in our case.

Embolization techniques when appropriately applied are eflèctive and safe and cany a low complication rate. The endovascular techniques have advantages over surgical procedures because they can be accomplished under local anesthesia with the neurological status of the patient being continuously monitored. Test occlusion can be performed to ensure tolerance of the occlusion prior to the detachment of the baloons or coils. Technique allows to reach almost all sites around the circle of Willis for direct aneurysm therapy. There is some residual flow following surgical ligation which leads to repeat hemorrhages and in endovascular techniques it is always possible to repeat an angiogram to ensure complete occlusion. Best results are in patient having good collaterals, There is minimal discomfort to the patient. The overall hospitalization time is also reduced if endovascular approach is taken. It is also cost effective as compared to surgery.

Higashida et al[12] described 87 patients treated with endovascular techniques for aneurysm involving the cavernous internal carotid artery. In 68 patients the parent vessel was occluded. In other 19 cases direct occlusion of the aneurysm was achieved with preservation of patent vessel. Complications include seven transient cerebral ischemia events, resolving subsequently. Two cases of delayed thromboembolic symptoms requiring antiplatelet medication. No death occurred.

Endovascular techniques for treatment of traumatic ICA pseudoaneurysm is a safe and effective alternative to surgery with an acceptable morbidity and mortality rate.

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