Case Report

Iatrogenic Basilar Artery Aneurysm: A Rare Vascular Complication of Transshphenoidal Transmaxillary Surgery: Case Report

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Summary

Vascular injury to structures adjacent to the sphenoid sinus and rostral clivus is a rare complication in transsphenoidal surgery. Carotid and basilar artery injury can be disastrous because of difficulty to obtain a proximal control. If an intraoperative injury is well controlled, a postoperative arteriography is necessary to search for a pseudoaneurysm. The rupture of all three layers of artery accompanied by an organized hematoma results in a false aneurysm (8, 11). This is the first case report in literature describing a basilar artery pseudoaneurysm after extracranial transmaxillary approach to a clivus tumor.

Key words: Transsphenoidal, transmaxillar, pseudoaneurysms

INTRODUCTION

Vascular injury to structures adjacent to the sphenoid sinus and rostral clivus is a rare complication in transsphenoidal surgery. Carotid and basilar artery injury can be disastrous because of difficulty to obtain a proximal control. If an intraoperative injury is well controlled, a postoperative arteriography is necessary to search for a pseudoaneurysm. The rupture of all three layers accompanied by an organized hematoma results in a false aneurysm (8, 11). This is the first case report
in literature describing a basilar artery pseudoaneurysm after extracranial transmaxillary approach to a clivus tumor.

CASE PRESENTATION

A 60 years-old female was admitted with complaints of headache, diplopia and drop attacks for one year. Neurological examination revealed sixth cranial nerve palsy on right side and upper extremity numbness. Hormonal status was normal. Magnetic resonance imaging (MRI) showed a heterogenously contrasted mass lesion localized at the upper-middle clivus destructing the sellar cavity, right posterior clinoid process, right petrosal bone (Figure 1,2,3). Computed tomography angiography (CTA) showed invasion of the right cavernous segment of the carotid artery.

Since the clival lesion extends to lateral and inferior part of the clivus and invades the right nasopharyngeal segment, a transmaxillary approach with Le Fort 1 osteotomy was planned.

The patient was supine with her head elevated 15-20 degrees and intubated orally. In order not to interrupt the intermaxillary fixation, intubation tube was passed between the space of posterior third of maxillary and mandibular molar teeth. After meticulous cleaning of the face, nasal and oral cavities, and packing the hypopharynx with a sponge, an upper buccal sulcus incision was done. A maxillotomy was performed using oscillating saw and upper clivus and sphenoid sinus were exposed.

A grayish soft tumor was resected subtotally without significant bleeding. During surgery there was no major arterial injury. The maxillary bone was fixed with miniplates and screws. The patient was extubated after 24 hours without any complication. There was no neurological deficits or dental problem. Prophylactic antibiotics (ceftriaxone 2g/ per day) were given for 3 days. Nasal tampons were removed on the second postoperative day. She was discharged on the 7th postoperative day. The histopathological examination showed a pituitary adenoma. During post operative period the hormonal status was normal.

After 13 days she referred us with fatigue and fever. A lumbar puncture revealed 400 leucocytes/ml and identified Staphylococcus aureus in CSF. Antibiotherapy with Meropenem 90 mg/kg and Vancomycin 200 mg/day were started. In the third day following this therapy, there was a massive nasal and oral bleeding, with acute blood pressure collapse (60/40 mmHg). The patient was intubated immediately and hypopharynx and nasal cavity were tamponated under pressure. After 8 hours from bleeding, blood pressure returned to normal and she remained conscious. We performed computed tomography and an angiography and showing an aneurysm of the basilar artery (Figure 4, 5). Aneurysm was embolized with placement of Guglielmi detachable coils (Figure 6). After intervention the neurological status stabilized and she gained full consciousness. On follow up examination two years after surgery she has no deficits and returned to daily activities.
Figure 1: Magnetic resonance imaging (MRI-T1W1) showed a heterogenously contrasted mass lesion localized at the upper-middle clivus

Figure 2: Magnetic resonance imaging (MRI - T2W, axial) showed a heterogenously contrasted mass lesion localized at the upper-middle clivus destructing the sellar cavity, right posterior clinoid process, right petrosal bone

Figure 3: Cranial Computed Tomography, axial view showed a mass lesion destructing the sellar cavity, right posterior clinoid process, right petrosal bone

Figure 4: Computed angiography tomography, axial view showed an aneurysm of the basilar artery
DISCUSSION

Iatrogenic pseudoaneurysms are usually caused by direct trauma to the arterial wall during surgical procedures, more often during transsphenoidal approach\(^7\). Vascular injury is a major reason of mortality in those surgeries. The transsphenoidal surgery and may be associated with pseudoaneurysms of major arteries\(^2,3\). The pseudoaneurysm incidence for the carotid-cavernous segment is between 0.2-1.2\(^\%\)\(^5,7\). Certain factors associated with the size, shape, and location of a pituitary tumor predispose the patient to iatrogenic arterial injury\(^12\).

Choosing the appropriate surgical approach requires an understanding of the tumor and its association with the anatomy of the skull base. Each approach has its own different cosmetic and functional deficits beside exposure.

Midfacial swing osteotomies can provide wide exposure to skull base, however, they are more invasive and morbidity of this procedure is high. Le Fort I osteotomies are generally used for correction of the midfacial deformities in plastic surgery practice, it can also give access to skull base with minimal morbidity and better cosmetic results. Excision of the caudal part of the vomer, dislocation of the septal cartilage provides enough room to work.

Injury of intracranial vessels is a rare complication of transsphenoidal surgery. Especially traumatic lesions of the basilar artery are quite rare and often fatal\(^7\). Anomalies of the internal carotid and basilar artery may facilitate the injury during transsphenoidal surgery\(^8\).

Magnetic resonance angiography or digital subtraction angiography can give valuable information about the variations of vascular structures. In order to avoid vascular injury, sphenoid mucosal dissection should be performed carefully if there is sellar floor erosion due to tumor invasion. Injury to the major arteries during transsphenoidal resection of pituitary tumors typically occurs during aggressive dissection of macroadenomas\(^10\).

The endovascular method provides an effective, relatively low-risk treatment for this difficult lesion, and is an excellent alternative to direct surgical repair\(^9\). Stent grafts have been used for carotid injury during transsphenoidal surgery\(^8,2\).

This report describes a case of traumatic aneurysm of the basilar artery in a patient after transmaxillary approach surgery. This is the first case report in the literature.

Figure 5: Cerebral Angiography, lateral view showed pseudoaneurysm in basilar artery location

Figure 6: Cerebral Angiography after performing embolization with Guglielmi detachable coils

825
REFERENCES