CASE REPORT

Clinoidal meningioma associated with an internal carotid artery aneurysm

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SUMMARY

Coexistence of primary brain neoplasms with intracranial aneurysms is rare but presents a diagnostic and therapeutic challenge to healthcare providers. We describe the case of a 60-year-old woman who had a left internal carotid artery aneurysm with a small ipsilateral clinoidal meningioma. The meningioma was an unexpected finding encountered during the surgery for aneurysmal clipping. Both the lesions were dealt with simultaneously.

BACKGROUND

Coexistence of primary brain neoplasms with intracranial aneurysms is rare,[1] but is becoming increasingly recognised.[2] This presents a diagnostic and therapeutic challenge to the healthcare provider. This coexistence is mostly brought to attention when the patient presents with brain tumour as the primary issue, or as an incidental finding on brain scans.[2]

We present the case of a patient with subarachnoid haemorrhage secondary to left-sided internal carotid artery (ICA) aneurysm. During surgery for clipping the aneurysm, we encountered an ipsilateral clinoidal meningioma. We dealt with both pathologies in the same setting.

No previously reported case of a clinoidal meningioma associated with an ICA aneurysm was found on review of the literature.

CASE PRESENTATION

A 60-year-old woman visited the emergency room of the Aga Khan University Hospital, Karachi. She was drowsy and unable to open her left eye. She awoke with these symptoms 10 days before presenting in the emergency room. She had no comorbidities apart from controlled hypertension. Her family reported that the patient had not experienced any such symptoms in the past and had no history of seizures, fever or unresponsiveness. Her family history was unremarkable for neurological issues. On examination, the patient was drowsy but reacted to verbal stimulus. She was following commands and was oriented to time, place and person. Left oculomotor palsy with complete ptosis and fixed dilated pupil was noted on ophthalmic examination. Direct and consensual pupillary reflexes were both absent in the left eye. No other cranial nerve or motor deficit was found on neurological examination. The patient was graded Hunt and Hess grade II and World Federation of Neurosurgical Societies grade II. CT of the brain revealed subarachnoid haemorrhage in the perimesencephalic region with Fischer grade II.

TREATMENT

The patient was admitted in the high-dependency unit for neuromonitoring and was started on nimodipine. After explanation of risks and benefits, a craniotomy for clipping of aneurysm was planned. A left pterional approach was made. After performing a C-shape durotomy, the sylvian fissure was opened, followed by frontal lobe retraction to localise the olfactory nerve. Unexpectedly, a well-circumscribed lesion was found, which was seen to be arising from the anterior clinoid process and directed posteriorly and superiorly. The lesion was not involving the ICA. The mass can be seen in figure 1, which is an intraoperative photograph of the unexpected lesion. A Grade II Simpson resection was performed for the lesion. This helped in achieving proximal control, before proceeding to the aneurysm clipping. After removal of the lesion, the ICA was identified and followed distally. The posterior communicating artery and oculomotor nerve were identified. A bi-lobed medium-sized aneurysm was seen originating from ICA distal to posterior communicating artery origin directed inferolaterally. A titanium clip was applied to secure the aneurysm. Postclipping distal and proximal flow was confirmed with the help of Doppler ultrasound. The postclipping angiogram (figure 2) shows the surgical clip in place.The patient was extubated and had postoperative management in a high-dependency unit.

OUTCOME AND FOLLOW-UP

Postoperatively, the patient did not develop any evidence of clinical vasospasm although angiographic vasospasm was identified in the ICA and its branches. CT scan showed complete excision of the lesion with no residual abnormalities. A closer

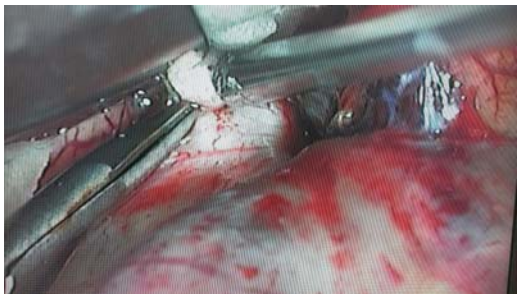

Figure 1 Intraoperative photograph showing resection of a well-defined lesion adjacent to anterior clinoid.

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Figure 2 The postclipping angiogram. The arrow points out the surgical clip in place.

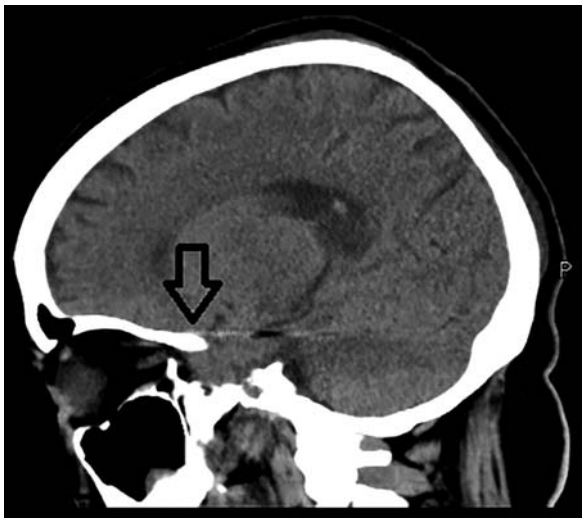

Figure 4 Postsurgical changes and absence of the left clinoid lesion shown in figure 1, suggestive of complete excision of the lesion.

review of the preoperative scans showed a small lesion involving the left clinoid, most likely representing a meningioma (figure 3). A postoperative scan revealed absence of the same lesion, suggesting complete excision (figure 4). Postoperative angiogram showed complete occlusion of the aneurysm. No new neurological deficit was seen and the patient was discharged home after 1 week. At 3 months after discharge, the patient is doing well and remains symptom free.

DISCUSSION

The incidence of intracranial aneurysms coexisting with brain tumours has been estimated to be approximately 1%.[1 3] They are generally thought to occur more frequently in pituitary adenomas.[3]

This is the first case describing the association of left-sided clinoidal meningioma with an ipsilateral ICA aneurysm. In their review on the coexistence of primary brain tumours with aneurysms, Zhong *et al*[2] have reported 18 cases of ICA aneurysms associated with meningiomas. In all reported cases, the coexistence of these pathologies was brought to notice while dealing with the tumour or was found on brain scans. In our case, the patient had subarachnoid haemorrhage and aneurysm, and the presence of meningioma was only intraoperatively appreciated. Only one case presenting in this manner has been reported in the literature. That patient had a small clinoidal meningioma found intraoperatively while managing a ruptured ophthalmic artery aneurysm.[4]

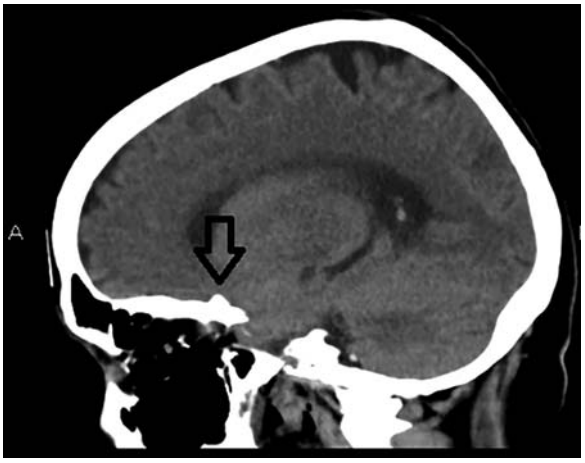

Figure 3 A small isodense to hypodense lesion involving middle region of the left clinoid. Cerebrospinal fluid sleeve around lesion and demarcation between lesion and normal parenchyma are suggestive of an extra-axial lesion, most likely meningioma.

Zhong *et al*[2] have discussed a total of 108 cases of brain tumours coexisting with aneurysms in a recent review. In 38% of cases, both the lesions were dealt with in the same setting. Out of a total of 18 cases of meningiomas and concurrent ICA aneurysms, both pathologies were addressed in the same setting on 5 occasions. Only the tumour was resected in six cases and aneurysm clipping/embolisation was performed only in five cases. In one patient, the tumour was excised first and the aneurysm was addressed in a second procedure. No intervention was carried out in one patient. Proximal spatial relationship of the tumour and aneurysm is the most important factor in deciding the treatment strategy. If the tumour is primary and proximal to the aneurysm, then simultaneous resection and clipping has been proposed as the best management option.[2] Javalkar *et al*[1] have described a similar case of a ruptured aneurysm and a proximal meningioma found intraoperatively. They also performed simultaneous clipping and resection in the same setting.

Pia *et al*[5] proposed that increased blood flow to meningiomas leads to the formation of aneurysms. Direct erosion of feeding arteries[1] and a dysgenetic factor produced by the tumour promoting aneurysm formation[5] have also been discussed as possible mechanisms to explain the incidence of meningiomas associated with aneurysms. The meningioma in our case was small, lacked high vascularity and was upstream of the aneurysm. Thus, in cases such as this, the hypothesis that increased blood flow to meningiomas or direct erosion of vessels is the cause of ipsilateral intracranial aneurysms does not stand firm. However, the number of cases is so small that definitive conclusions cannot be drawn.

Any unexpected pathology while dealing with one of the more demanding surgeries is highly undesired. This case emphasises the need of a high index of suspicion when reviewing preoperative scans, especially when dealing with an obvious

pathology. It is not uncommon for physicians to tend to focus on the obvious pathology, thus possibly missing the less obvious abnormalities on preoperative scans. We could have prevented this unwanted surprise by having a high clinical suspicion of a co-existing pathology before planning the surgery. While it has been suggested to obtain a preoperative MR angiography in patients with brain tumours, to rule out aneurysms,[3] the value of a close review of preoperative radiology cannot be underestimated to avoid unexpected lesions in patients presenting with haemorrhage and aneurysms, such as the case presented above.

Learning points

- A detailed analysis of preoperative imaging can help in the detection of coexisting intracranial pathologies. Subtle and inconspicuous findings of coexisting pathologies are likely to be missed when dealing with an obvious lesion.
- Although the incidence of unsuspected coexisting lesions in the brain is rare, it does warrant a higher index of suspicion from the surgeon so that they are not missed preoperatively.
- The current hypothesis of increased vascularity and tumour erosion into arteries causing ipsilateral intracranial aneurysms fails to explain this coexistence in all cases.
- A patient and meticulous approach in such cases, with simultaneous clipping of the aneurysm and resection of the neoplasm, can achieve optimal results for the patient.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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