

An Intracranial Intrasellar Kissing Carotid Arteries: A Case Report

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ABSTRACT

We present a rare case of intracranial intrasellar kissing carotid arteries in a 68 years-old male in Saudi Arabia. This is a rare anomaly of the carotid arteries, where both internal carotid arteries deviate medially and touch each other near the midline within the sphenoid sinus or the sphenoid bone, including the sella. This can cause compression of the pituitary gland and presents as a hormonal insufficiency. The narrowing of the space due to pituitary compression may complicate Trans sphenoidal surgery.

This patient presented with generalised fatigue, weakness and weight loss. He was complaining of nausea, anorexia and weight loss. During the work up, he was submitted to pituitary MRI and found intracranial and intrasellar kissing carotid arteries.

As per our plan, conservative treatment started and hormonal replacement therapy continued for the pan hypopituitarism. He was advised to visit clinic for the regular follow up with frequent lab testing. The Surgeon was informed about this carotid anomaly to avoid possible complications during surgery.

The present case report highlights the importance of the internal carotid artery anomaly and its clinical relevance of investigating and identifying prior to the transsphenoidal surgery. If not detected before the surgery, this may complicate the surgery and prove fatal to the patient.

Keywords: Intracranial intrasellar kissing carotid arteries; Pituitary compression; Pan hypopituitarism; Pituitary replacement therapy; Carotid artery anomaly; Pituitary hormone insufficiency

INTRODUCTION

Kissing carotids can be intracranial or extracranial variants. Extracranial kissing carotids is an anatomical variant of the extracranial internal carotids arteries, where both sides of the arteries displaced medially, “kissing” in the retropharyngeal space. Intracranial intrasellar kissing carotid arteries is a rare anomaly of the carotid arteries, where both internal carotid arteries deviate medially and touch each other near the midline within the sphenoid sinus or the sphenoid bone. This deviation may lead to compression of the pituitary gland and presents a patient with complaints of hormonal deficiency or panhypopituitarism.

Few authors have noted primary amenorrhoea due to kissing

internal carotid arteries as an unusual cause by compressing and leading to hypopituitarism and gonadotropins deficiencies. Though exact incidence of the intracranial intrasellar kissing arteries is not reported in literature, we do come across such incidents, where patient presents with very unusual complaints. King Abdul Aziz Specialist hospital is teaching tertiary care hospital in Taif region, Saudi Arabia. We present an elderly man, who came to our hospital OPD clinic with unusual symptoms. It was our suspicion which prompted us to go for hormonal work up and MRI scan and surprised to find the intracranial intrasellar kissing arteries.

It is prudent to identify this anomaly before undertaking any sub sphenoid surgery as this might lead to complication during surgery and may prove fatal to the patient.

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CASE PRESENTATION

A 68 year old Saudi Arabian male who was known case of diabetes, hypertension and central hypothyroidism on medications presented to King Abdul Aziz Specialist Hospital, Taif, Saudi Arabia with complaints of generalized fatigue and dizziness since one month. He noticed these symptoms associated with nausea, anorexia and loss of weight over 3 kg, were increased more from the last one week [1-4].

On examination, blood pressure was 109/65 mm Hg and noticed a postural drop at systolic blood pressure of 20 mmHg, heart rate: 99 per minute, respiratory rate: 19 per minute, Temperature: 36.3°C, oxygen saturation(SpO₂): 97%. Patient was lethargic and looked fatigue. There were no signs of dehydration or skin pigmentation. There was no neurological deficit and other medical examinations were unremarkable.

Medication history

Patient had insomnia as he was worried about his illness and was given citalopram since last two weeks. Other medications were as follows:

- Tab. Metformin 500 mg three times a day
- Tab. Sitagliptin 100 mg once daily
- Tab. Atorvastatin 20 mg once daily
- Tab. Perindopril 5 mg once daily
- Tab. Thyroxin 75 mcg daily
- Liver and renal functions were all within normal range.
- Pituitary MRI scan workup

With the above complaints and lab values, patient was admitted as a case acute hyponatremia for work up and administered 3% Normal saline 100 ml as a bolus. IV Fluid 0.9% Normal saline of 60 ml/hour and 2 gm of salt three times a day was given with meals and stress dose hydrocortisone was given Table 1.

Tests	Result	Normal reference
Sodium	127	135-145 mEq/L
Potassium	4.3	3.5-5.2 mmol/L
Chloride	93	96-106 mEq/L
Serum osmolality	243	275-295 mOsm/Kg
Urine osmolality	418	500-850 mOsm/Kg
Urine sodium	50	40-220 mEq/d
Serum cortisol	0.2	5-23 mcg/dl
Serum ACTH	55	10-60 pg/mL
HbA1c	6.6	Below 5.7
LH	0.5	1.8-8.6 IU/L
FSH	1.3	1.5-12.4 mIU/mL

Testosterone	0.02	10-35 nmol/L
Prolactin	1.47	Less than 20 ng/mL
TSH	0.005	0.5-5 mIU/L
FT4	14	12-22 pmol/L
FT3	5	3.1-6.8 pmol/L

Table 1: Patient lab results at admission.

Imaging investigation-Pituitary MRI with contrast revealed intracranial intrasellar kissing carotid arteries (Figures 1 and 2).



Figure 1: This is our patient’s MRI pituitary with contrast (Kissing internal carotid arteries compressing the pituitary gland).

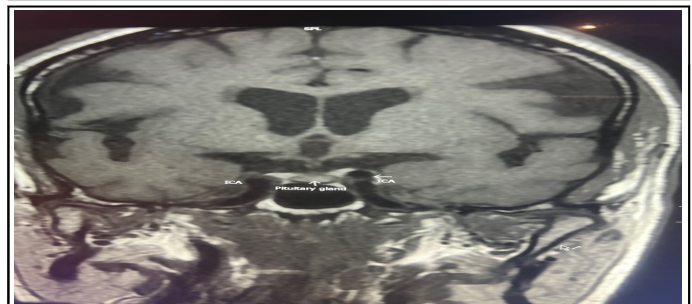


Figure 2: MRI of normal pituitary.

Conservative treatment was the choice and initiated for this patient. He was discharged on pituitary hormone replacement as follows.

Testosterone 100 mg once weekly

Thyroxin 75 mcg once a day

Hydrocortisone 10 mg at am and 5 mg at pm (two times a day)

Later during a follow up at clinic, we found his sodium level improved to 143 mEq/liter, and clinically there was no more fatigue, dizziness or vomiting. Patient was improved in due course.

Our patients accepted to report and publish his case.

RESULTS AND DISCUSSION

Pituitary gland controls and organizes other glands of our body. It is divided into two major lobes, anterior lobe (adenohypophysis) comprises 80% of pituitary size and posterior lobe (neurohypophysis) that is controlled by the hypothalamus and connected by infundibulum.

Pituitary gland located in the pituitary fossa (sella turcica) in sphenoid bone and surrounded laterally by cavernous sinus that contain cranial nerve III, IV, VI and medially cavernous part of the carotid artery and supplied by hypophysial portal system branches from internal carotid artery.

Various vascular anomalies of the Internal Carotid Arteries (ICAs) may occasionally arise in the sellar and parasellar region. Internal carotid artery has seven segments. Cervical (C1), Petrous (C2), Lacerum (C3), Cavernous (C4), Clinoid (C5), Ophthalmic (C6) and Communicating segments (C7). Our concern in this case was on cavernous part (C4). Cavernous part of internal carotid artery starts from the petrolingual ligament end to the proximal dural ring and surrounded by cavernous sinuses. It is tortuous part and, in some cases, can be close to each other causing narrowing and compression to the pituitary [5].

The second important issue in this case is the kissing carotids which occur when internal carotids deviate medially and meet each other within the sella. This would lead to pituitary stalk compression and interference with the delivery of releasing and inhibiting factors to the pituitary and direct destruction of pituitary tissue by the mass effect and thus causing pituitary hormonal dysfunction and insufficiency [6,7].

Other anomalies of the internal carotid arteries like intracranial aneurysms situated inside the sella or in the parasellar region with intrasellar extension are also reported to cause pituitary dysfunction [8,9].

Presence of intracranial intrasellar kissing carotid arteries may also complicate Trans sphenoidal approaches [10-12]. Presently, trans sphenoidal surgery is a well-established procedure and the principal surgical technique for removal of most pituitary tumours [13,14]. This approach is considered to be safe with mortality rates less than 1%. Nevertheless, various complications of this procedure have been reported [15]. Vascular complications can contribute to serious morbidity and mortality, therefore trans sphenoidal surgery can be hazardous in patients with intracranial intrasellar kissing carotid arteries and its presence must be always excluded by preoperative imaging evaluation [16,17].

This Preoperative radiological testing will detect the extra cavernous intracarotid distance as the narrowing distance can increase the risk of carotid injury approximately 0.4%-1.4% vascular mortality and morbidity, stroke, carotid artery spasm and carotid-cavernous fistula [2,7].

Though patient has panhypopituitarism picture, conservative management was the choice for person with intracranial intrasellar kissing carotid arteries with symptoms due to compression. Treatment is targeted to the replacement of insufficient hormone, as it can also mimic other causes of panhypopituitarism [16-18].

CONCLUSION

Intrasellar kissing carotid is a very rare anomaly of carotid artery and its clinical relevance must be always remembered. It can be

hazardous to the patient as it causes hypopituitarism. This is usually discovered incidentally in brain using imaging techniques with Computed Tomography Angiography (CTA) or MRI. Conservative treatment with hormone replacement is the treatment of choice. Intrasellar kissing carotid arteries can interfere with Trans sphenoidal surgery and causes fatal complications if not screened prior to the surgery. It is prudent to be discovered prior to the surgery as potential dangerous situation can be avoided.

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