AFRICAN JOURNAL OF MEDICINE and medical sciences

VOLUME 32, NO 1 MARCH 2003

EDITOR
B. O. OSOTIMEHIN

ASSISTANT EDITOR
A. O. UWAIFO

ISSN 1116—4077

Afr. J. Med. med. Sci (2003) **32**, 89-91

Traumatic vertebral artery pseudoaneurysm: a case report

OGB Nwaorgu*, KJ Ayodele*, OA Falebita+, PA Onakoya* and OA Adebo+
Department of Otorhinolaryngology and Cardiothoracic Surgical Division+, University College Hospital, Ibadan, Nigeria*

Summary
A case of traumatic vertebral artery pseudoaneurysm in a 16-year-old Nigerian male following a stab wound is described. Successful surgical treatment by proximal Subclavian artery control and excision of the lesion was achieved. The value of Doppler ultrasonography in the diagnosis is highlighted. This case illustrates and re-emphasises that this rare lesion should be considered in patients with neck mass following penetrating posteriorly located neck injuries.

Keywords: *Trauma, vertebral artery pseudoaneurysm, proximal control.*

Résumé
Un cas de traumatisme de l'artère vertèbral pseudo-aneurysme causè par une blessure de poignarde a etè suivi chez un garcon Nigèrian agè de 16 ans. Un traitemnt chirugique rèussit par le controle de l'artère subclavian proximale et l'ecision de la lèsion etait effectuè. La valeur de test de l'ultrasonographie de Doppler a etè déterminè. Ce cas illustre et met l'emphasie que cette lèsion rare pourrait etre considerèe aux patients avec une masse cou, accompagnè des blessures au cou penetrant postèrieurement.

Introduction

Aneurysms occur in the intracranial as well as the extracranial portions of the vertebral artery. Its intracranial forms are almost exclusively congenital lesions constituting 5% of all intracranial aneurysms [1], while the extracranial forms are rare and often traumatic [1-7]. Contributing factors to the apparent rarity of this condition are the anatomic position of the vertebral artery [1-5] and the high mortality associated with injury to the vessel either singly or in patients with multiple injuries [2].

This case describes our experience of a patient with traumatic left vertebral artery pseudoaneurysm (VAP) with unusual clinical features at presentation but who was successfully treated by proximal control of the subclavian artery, excision of the aneurismal sac and repair of the injured site.

Correspondence: Dr. OGB Nwaorgu, Department of Otorhinolaryngology, University College Hospital, Ibadan, Nigeria. E-mail: geoniks@skannet.com

Case report

O.A. is a 16-year old male secondary school pupil who presented with a 9-month history of essentially painless, progressively increasing left-sided neck swelling. The onset of swelling was preceded by a month history of stab injury to the region, which was sutured at a private hospital immediately following the injury.

The swelling was associated with progressive neck stiffness with restriction limited to ipsilateral flexion movement only. There were no associated rhinological, otological or neuro-ophthalmic symptoms. There was no associated dysphagia, odynophagia, stridor, dyspnoea, hoarseness or constitutional symptoms.

Essential findings on physical examination were a left sided firm, non-tender neck mass with poorly defined edges. It involved and completely covered the ipsilateral posterior triangle of the neck, measuring 20 cm by 12 cm, extended from the left infra-auricular region to the supra-clavicular fossa in the vertical dimension and from the anterior aspect of the left sternocleidomastoid to the spine in the horizontal dimension (Figure 1).

Fig. 1: Left neck swelling of the patient.

It was not warmer than the surrounding structures and most importantly, non-pulsatile and no bruit heard over the mass. Other systemic examination findings were essentially normal.

An initial clinical diagnosis of traumatic left carotid aneurysm was made. However a left carotid arteriography using the Seldinger technique and fine needle aspiration cytology (FNAC) showed no aneurysm and amorphous material, respectively (Figure 2).

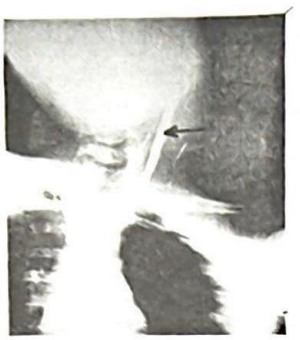

Fig. 2: Normal left common carotid arteriography.

Essential investigative findings include a left-sided soft tissue shadow involving the whole of the neck region with preservation of the laryngo-tracheal air column on X-ray soft tissue neck. A Doppler ultrasonography revealed a 6 cm by 5.2 cm by 12 cm mixed echogenic mass. There were cellular and cystic areas with intrinsic motion of the cellular contents suggesting blood flow with a thickened superficial wall. Vascular blood flow studies showed features in keeping with an aneurysm with artero-venous anastomosis (Figure 3). He was retroviral negative on screening and other blood parameters were essentially normal.

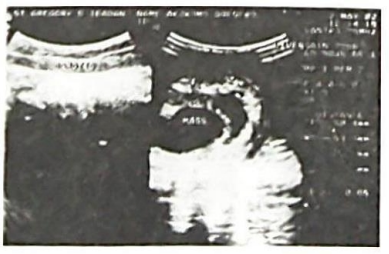

Fig. 3: Doppler ultrasonography of the left neck swelling showing an aneurysm.

At this point, patient was considered to be having an aneurysm, a hematoma or seroma. Thus, a multi-disciplinary team comprising of head and neck and cardiothoracic surgeons undertook a definitive treatment; neck exploration with a left anterolateral thoracotomy. Findings at surgery were: distorted neck anatomy, cystic mass in the left posterior triangle of the neck, false aneurysm of the second intraspinous portion of the left vertebral artery (leaking), carotid sheath displaced anteromedially and iatrogenic laceration of the left internal jugular vein.

Excision and repair of the pseudoaneurysm was possible after a proximal control of the left subclavian artery via a left anterolateral thoracotomy as well as repair of the iatrogenic laceration of the internal jugular vein. Post-operative recovery was essentially uneventful and patient was discharged to the outpatient clinic on the 12th post-operative day. Follow up of the patient has shown complete recovery with the exception of a minimal residual weakness of the left deltoid muscle.

Discussion

A pulsatile mass following penetrating trauma to the neck had in the past been erroneously considered to indicate only the involvement of the carotid or subclavian artery [2]. It is now known that such injuries can involve the vertebral artery as in our case. Acquired vertebral artery aneurysm can also result from non-penetrating trauma such as chiropractic manipulations, [3,8] complications of artherosclerotic and connective tissue diseases [1] and neurofibromatosis [3]. It has also been reported following internal jugular vein catheterization [8] and transarticular screw fixation of unstable cervical vertebrae [9].

Clinically, either as a result of compression or mechanical effect of the aneurysm on surrounding structures, the patient may present with dysphagia, shoulder pain, Horner's syndrome, fullness of the oropharynx, tinnitus, nausea, vertigo, or ataxia [3]. The persistence of a bruit while the common carotid artery is compressed has been considered the most reliable sign of vertebral artery involvement [2,3]. Bruit or pulsations were not observed in our patient. This may be due to the small laceration, which was situated in the second intraspinous segment of the artery. The firm prevertebral fascia and paravertebral muscles must have contributed to the initial tamponade created by the bleed. Subsequent and intermittent bleeds led to the slow but progressive increase in size of the aneurysm. This was also observed by Kister et al. [2].

In the past, only half of the vertebral artery aneurysm was diagnosed accurately before treatment or death [1]. This however, has changed with improvement and availability of diagnostic facilities. A four-vessel angiography, which not only shows the exact location of the lesion but also demonstrates the anatomy of the contralateral vertebral artery best assesses the lesion [3]. Although angiography is the gold standard modality,

Doppler Ultrasound (US), CT scan, and MRI findings can be sufficient to demonstrate vertebral artery pseudoaneurysm [8]. However, CT, MRI and angiography are expensive with varying degrees of invasiveness while Doppler US is available, affordable and can be done as an office procedure.

The treatment of traumatic vertebral artery aneurysm is by excision, though difficult [2]. Although a preoperative diagnosis of an aneurysm was made, a modified Schobinger incision was used, should the lesion require a neck dissection. Our patient was treated successfully by proximal control of the subclavian artery and excision of the pseudoaneurysm.

Acknowledgements

We are grateful to Mr. Bola Bajo of the Biomedical Institute, College of Medicine, University of Ibadan for his assistance in producing the illustrations.

References

1. Thompson JE, Eilber F, Baker JD. Vertebral artery aneurysm: Case report and review of literature. Surgery 1979; **85**: 583 – 585.
2. Kister, SJ, Rankow, RM. Traumatic aneurysm of the first portion of the left vertebral artery. Plast Reconstr Surg. 1966; **37**: 546 – 549.
3. Wiener I, Flye MW. Traumatic false aneurysm of the vertebral artery. The Journal of trauma 1984; **24**: 346 – 348.
4. O' Connel JD, Sutton D, Kendall B. Traumatic vertebral artery aneurysm: Report of two cases. Br. J. Radiol. 1975; **48**: 670 – 673.
5. Case MES, Archer CR, Hsieh V, Codd JE. Traumatic aneurysm of the vertebral artery. Angiology 1979; **30**: 138 – 142.
6. Alves AM, Black C. Post-traumatic extra-cranial aneurysm of the vertebral artery. Intern. Surg. 1972; **57**: 422 – 424.
7. Adeloye A, Ngu VA, Latunde Odeku E. Traumatic aneurysm of the first portion of the right vertebral artery. Br J Surg 1970; **57**: 312 – 314.
8. Cihangiroglu M, Rahman A, Yildirim H, Burma O, Uysal H. Iatrogenic vertebral artery pseudoaneurysm: US, CT and MRI findings. Eur J Radiol 2002; **43**: 14 – 18.
9. Prabhu VC, France JC, Voelker JL, Zoarski GH. Vertebral artery pseudoaneurysm complicating posterior C 1 – 2 transarticular screw fixation: case report. Surg Neurol 2001; **55**: 29 – 33.