



Case Report

Bow hunter's syndrome treated by anterior decompression with fusion: A case report

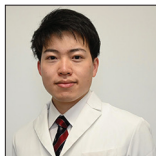
Kazuya Morita¹, Akira Tamase¹, Hiroyuki Abe¹, Kentaro Mori¹, Issei Fukui¹, Ryotaro Yamashita², Mutsuki Takeda², Tatsu Nakano², Hiroshi Shima³, Motohiro Nomura¹

Departments of ¹Neurosurgery, ²Neurology, Yokohama Sakae Kyosai Hospital, Yokohama, ³Department of Neurosurgery, Shima Neurosurgical Orthopedic Clinic, Kawasaki, Kanagawa, Japan.

E-mail: *Kazuya Morita - morikazu1296@gmail.com; Akira Tamase - reo55555@gmail.com; Hiroyuki Abe - abehiro112358@gmail.com;

Kentaro Mori - squad1979@me.com; Issei Fukui - i-fukui@yokohamasakae.jp; Ryotaro Yamashita - yamashitaryotaro@gmail.com;

Mutsuki Takeda - januarytks@yahoo.co.jp; Tatsu Nakano - tatsu_nkn@yahoo.co.jp; Hiroshi Shima - island@vesta.ocn.ne.jp; Motohiro Nomura - nomura413jp@yahoo.co.jp



*Corresponding author:

Kazuya Morita,
Department of Neurosurgery,
Yokohama Sakae Kyosai
Hospital, Yokohama, Japan.

morikazu1296@gmail.com

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ABSTRACT

Background: Bow hunter's syndrome (BHS) is a rare condition induced by occlusion or compression of the vertebral artery (VA) during head movement or rotation. Here, we report a patient with BHS effectively treated with an anterior cervical discectomy and fusion (ACDF).

Case Description: A 75-year-old male experienced recurrent embolic strokes to the posterior circulation. This was attributed angiographically to transient stenosis of the right VA due to a right-sided C5-C6 osteophyte when the head was rotated to the right; the stenosis was improved when the patient rotated his head to the left. The patient successfully underwent a C5-C6 ACDF for removal of the right-sided lateral osteophyte which resulted in no further transient right-sided VA occlusion.

Conclusion: Following a C5-C6 ACDF for removal of a right lateral osteophyte, a 75-year-old male's intermittent right-sided VA occlusion responsible for multiple posterior circulation emboli was relieved.

Keywords: ACDF, Bow hunter's syndrome, Osteophyte, Repeated infarction

INTRODUCTION

Bow hunter's syndrome (BHS) is a rare condition characterized by vertebrobasilar insufficiency associated with transient occlusion typically of the dominant vertebral artery (VA) due to bony impingement (i.e., osteophyte formation) during head movement/rotation.^[2,4] Common symptoms of BHS include positional vertigo, dysarthria, dysphagia, nausea, and syncope.^[4] Surgery for BHS usually includes decompression with/without fusion. Here, we successfully treated a 75-year-old male with BHS responsible for multiple/recurrent posterior cerebral circulation emboli/infarctions by performing a C5-C6 anterior cervical discectomy/fusion (ACDF) with resection of the offending right-sided C5-C6 osteophyte.

CASE PRESENTATION

A 75-year-old male presented with the left upper limb weakness. The brain magnetic resonance images (MRI) and MR angiography (MRA) showed evidence of multiple embolic infarctions

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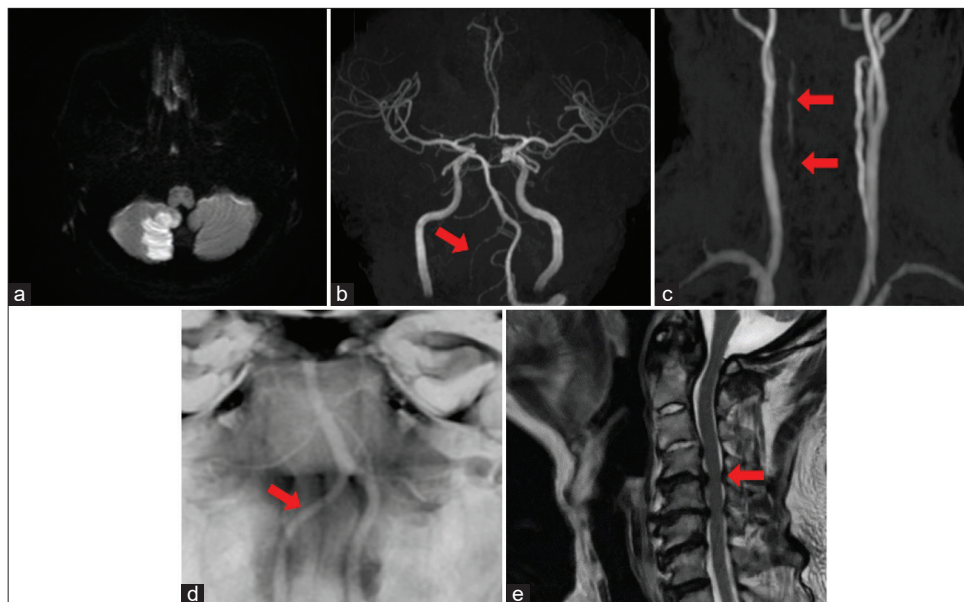


Figure 1: Magnetic resonance imaging on admission. (a) Diffusion-weighted image showing high-intensity area in the right cerebellum. (b and c) Faint opacification of the right VA (arrow). (d) BPAS demonstrating the diameter of the right VA is smaller than that of the left (arrow). (e) Stenosis of spinal canals at C4/5 (arrow) in addition to C5/6.

from the right VA to the right cerebellum, right parieto-occipital junction, and right occipital lobe. The cervical MRI documented significant spinal stenosis and contrast-enhanced computed tomography (CE-CT) revealed a large lateral right-sided C5-C6 osteophyte. Angiography showed it transiently compressed the right VA when the head was rotated to the right, but with relief of VA compression, when the head was rotated to the left [Figures 1-3].

Surgery

To prevent recurrent thromboembolic events, the right VA was decompressed by performing a routine C5-C6 ACDF with excision of the right-sided C5-C6 osteophyte; this successfully decompressed the right VA [Figures 4a and b]. Patency and sufficient blood flow through the right VA were confirmed intraoperatively utilizing indocyanine green video angiography [Figure 4c]. As the preoperative MRI had also demonstrated spinal canal stenosis at C4-C5, an additional C4-C5 ACDF was performed. Following these decompressions, threaded titanium cages filled with bone graft substitutes were inserted into the C4/5 and C5/6 intervertebral spaces [Figure 5a].

Postoperative confirmation of VA decompression

The patient's postoperative course was uneventful. Sufficient right-sided C5-C6 osteophyte resection and right VA decompression were confirmed on the postoperative CE-CT and 3D-CTA [Figure 5b]. The postoperative MRA documented right VA patency along with no further evidence of cerebellar infarctions awhile [Figure 5c]. Angiography

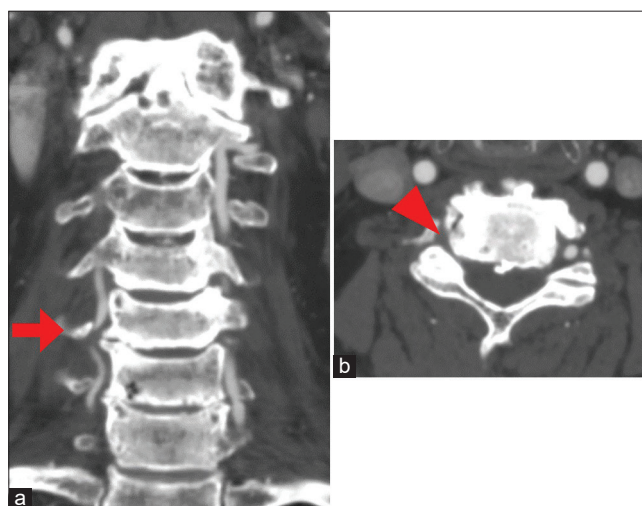


Figure 2: Preoperative CE-CT images. (a) Stenosis of the right VA due to compression by the bony spur at C5/6 (arrow). (b) An axial image at the level of C5/6. The right VA is not demonstrated due to transient occlusion.

3 months later again demonstrated no residual right-sided C5-C6 VA stenosis in any position and the MRI showed no additional/recurrent posterior circulation strokes [Figure 6].

DISCUSSION

BHS

BHS is characterized by transient symptoms induced by rotation or extension of the neck resulting in occlusion/stenosis

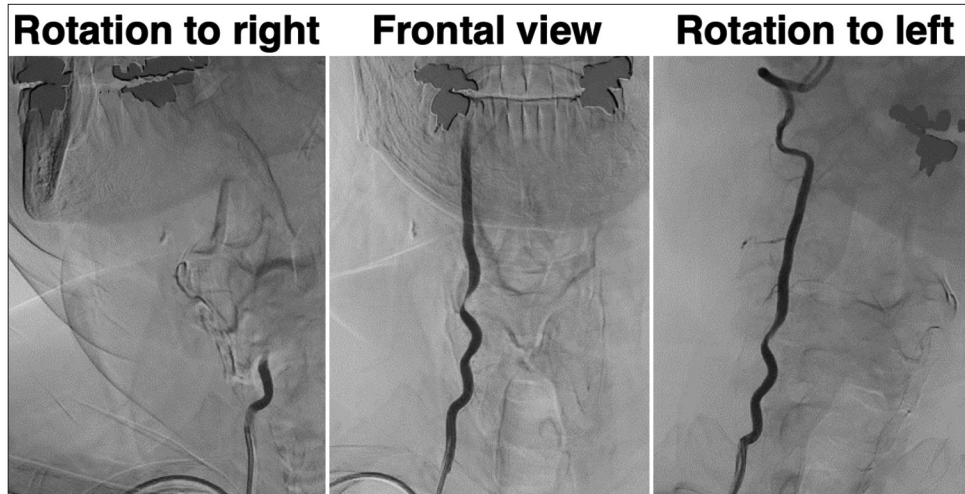


Figure 3: Preoperative angiography of the right VA with neck rotation. The right VA is stenotic under the neutral neck position (mid panel). It is occluded with head rotation to the right and the stenosis is improved with rotation to the left.

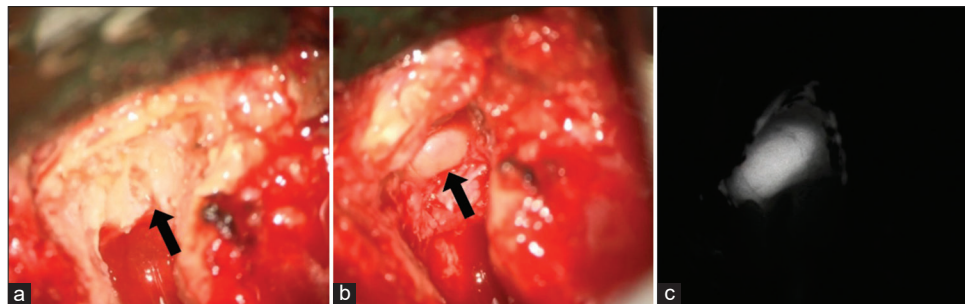


Figure 4: Intraoperative images. (a) The right side of joint of Luschka is exposed (arrow). (b) After resection of the osteophyte, the right VA is exposed and decompressed (arrow). (c) The right VA is visualized by indocyanine green video angiography.

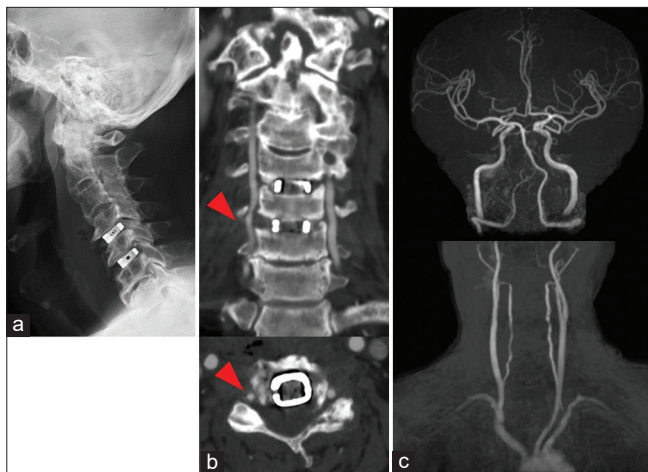


Figure 5: Postoperative images. (a) X-ray images showing ACDF are successfully performed. (b) MIP image of CE-CT showing resection of the osteophyte and no stenosis in the right VA (arrowhead). (c) MRA showing improvement of the blood flow of the right VA.

of a VA, and resultant compromises to the posterior circulation. Symptoms typically include syncope, vertigo, dizziness,

impaired vision, paresis, and pain in the extremities.^[1,2] Most cases of VA stenosis involve the V2 (58%) or V3 (36%) VA segments. In our patient, the right VA was compressed by a right-sided osteophyte at the C5/6 level. On multiple MRA/CTA studies, the right-sided VA blood flow was transiently impaired by head rotation to the right (ipsilateral) side at the C5-C6 level, partially compromised in the neutral position, but relieved by rotation of the head to the left. Thrombus formation in the transiently compressed VA, as seen in our patient, can result in distal embolization/strokes; with emboli extending into the posterior cranial circulation. Thus, for patients presenting with repeated ischemic posterior circulation events, BHS with transient VA stenosis must be considered and remediated.

The treatment of BHS

The treatments for BHS include anterior cervical discectomy/corpectomy fusion with decompression/removal of osteophytes (90.6%), posterior decompression with/without fusion addressing occlusions of the V2 or V3 segments of the VA, or endovascular management (i.e., stenting for significant tortuosity of the VA without bony compression).^[3,5]

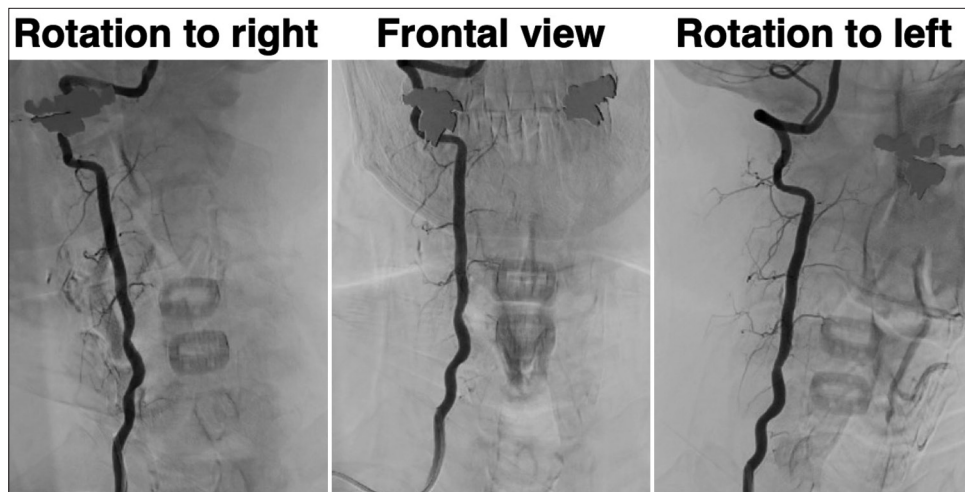


Figure 6: Follow-up angiography of the right VA with neck rotation. Angiography of the right VA after ACDF showing sufficient blood flow regardless of neck position.

CONCLUSION

A 75-year-old male with BHS due to a right-sided C5-C6 osteophyte that would transiently compress the right VA when the patient's head was rotated to the right, presented with repeated cerebral/cerebellar posterior circulation infarctions. Following a routine C5-C6 ACDF with the right-sided osteophyte resection, the transient right VA occlusion was alleviated, and the patient's symptoms were permanently resolved.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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