Direct Vertebral Artery Decompression for treatment of Bowhunters Syndrome

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Abstract

We present a young man with Bowhunter's syndrome manifesting as faintness and agitation triggered by rightward head rotation. Dynamic angiography revealed near-complete occlusion of the dominant left V3 segment with head turning, in the setting of a hypoplastic contralateral vertebral artery. He underwent far lateral exploration of the left V3 with release of a constricting ligamentous band and bony decompression of C1. Postoperative angiography confirmed decompression with preserved flow, and his symptoms completely resolved.

Introduction

Clinical History:
Male in third decade of life with no significant past medical history who presents with confusion and loss of consciousness when turning head to the right.

Exam:
Nonfocal neurological exam in neutral head position. Rapid onset agitation and reduced consciousness when provoked with right head turn.

Diagnosis:
Bowhunter's disease is a vascular condition in which turning or extending the head mechanically compresses the vertebral artery, leading to temporary insufficient blood flow to the brain's posterior circulation causing symptoms like vertigo, syncope, or neurologic deficits.[1] It is most often caused by cervical spine degenerative changes.

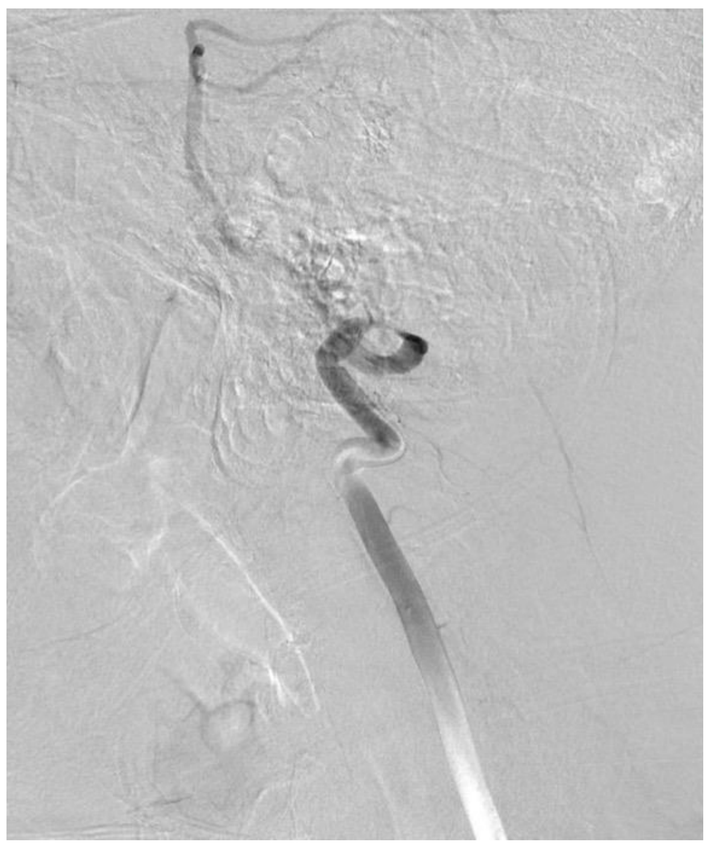

Figure 1. Diagnostic angiogram demonstrating left vertebral artery injection with head turned to the right that reveals focal dynamic stenosis of V3 segment at the region of the sulcus arteriosus.

Operative Plan

Operative Decision Making:
Given the severity of symptoms, rapid onset, and poor tolerance the patient has with right head turn as well as the radiographic findings of a dominant left vertebral artery that demonstrates reduced to near absent flow to the posterior circulation with dynamic testing, surgical exploration and vertebral artery decompression was offered.

Position:
3/4 prone position, mayfield head clamp with head in anatomically neutral position

Approach:
Far lateral exploration and decompression of left V3 segment

Operation

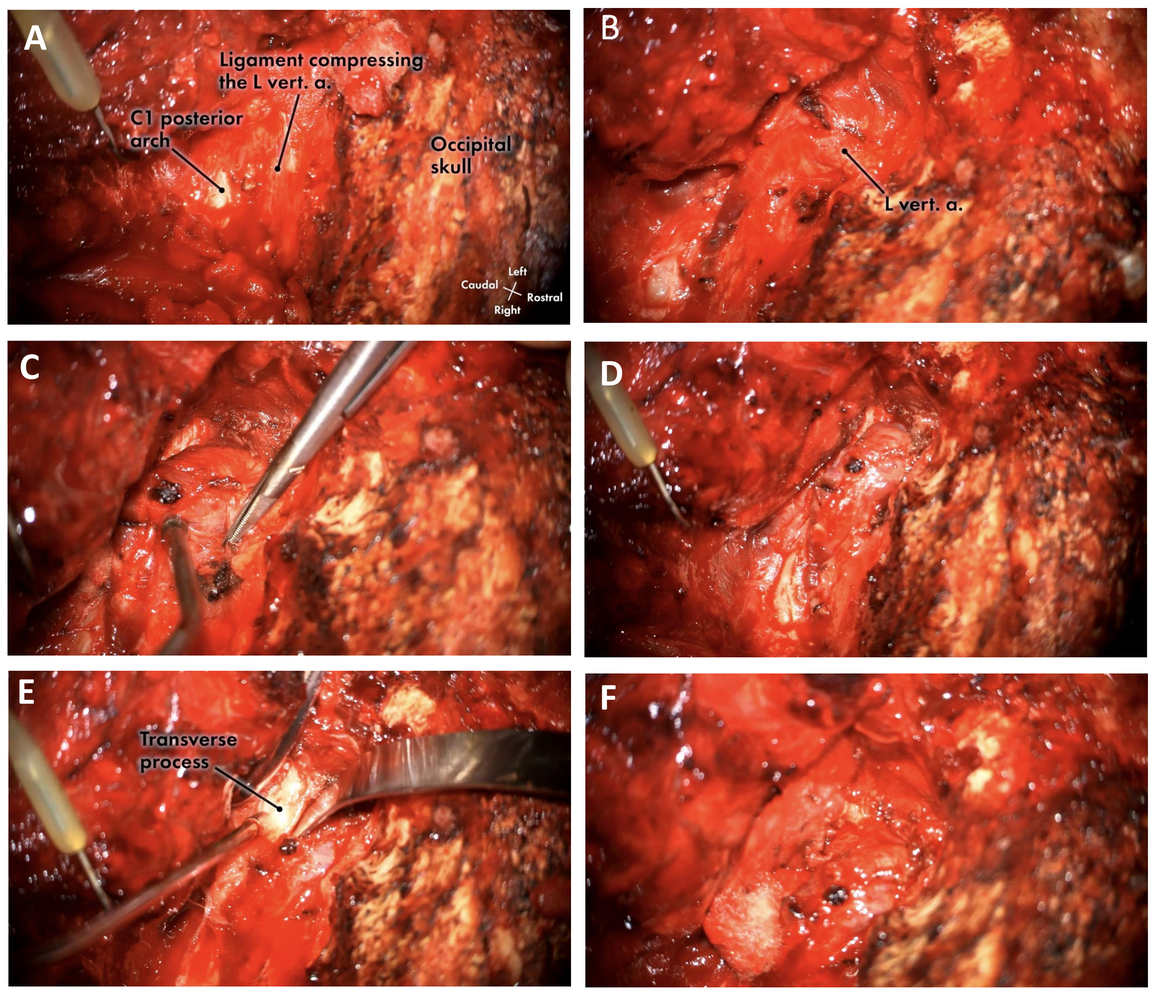

Figure 2. A| Far lateral exposure of C1 posterior arch revealing ligament compression of the left vertebral artery and the occipital skull. B| Left vertebral artery exposed. C| Decompression of left vertebral artery. D| Decompressed vertebral artery. E| C1 transverse process noted along the path of the vertebral artery. F| Boney decompression and unroofing of vertebral artery.

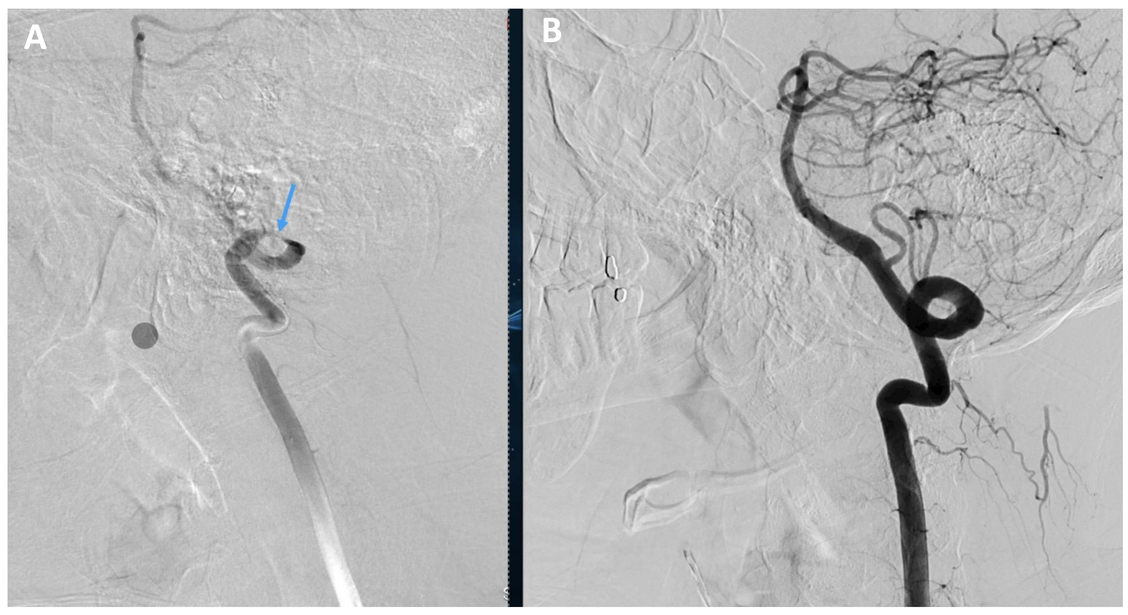

Figure 3. Preoperative (A) and postoperative (B) dynamic angiograms demonstrating resolution of stenosis and a patent left vertebral artery with head turned to the right.

Post Operative Course

Postoperatively, the patient did very well. He was neurologically intact without recurrence of symptoms with provocative testing.

Repeat DSA revealed the dominant left vertebral artery was widely patented with neutral and turned head positions.

The dynamic compression of the left V3 was no longer apparent.

Conclusions

In summary, far lateral exploration with decompression of the V3 segment provided definitive treatment for Bow Hunter's syndrome, restoring vertebral artery flow and eliminating the patient's positional symptoms.

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References

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