

Posterior Cervical Facetectomy and Lateral Mass Screw Fixation for Rotational Ischemic Vertebral Artery Compression (RIVAC) Syndrome from Facet Hypertrophy Below C2

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Introduction

The authors propose a new terminology called Rotational Ischemic Vertebral Artery Compression (RIVAC) Syndrome to characterize patients with severe cervical facet hypertrophy below C2 that compresses the vertebral artery during rotation of head. The authors describe presentation, diagnosis, and surgical management of three patients with RIVAC syndrome.

Methods

Retrospective analysis of 3 patients who presented with reproducible symptoms of vertebrobasilar ischemia on rotation of head was performed between 2004 and 2012. We reviewed pre-operative and post-operative dynamic cerebral angiograms and CT scans of the cervical spine. We reviewed the method of surgical treatment and clinical and angiographic outcome.

Results

A total of 3 patients (mean age 65 +/- 5 years) presented with symptoms of vertebrobasilar ischemia (reproducible dizziness or near-syncope) when the head is rotated to the left side. Dynamic cerebral angiogram showed occlusion of the left cervical vertebral artery at C5-6 disc level (N=1) or severe compression without occlusion at C4-5 (N=2) only when the head is turned to left beyond 45 degrees. Pre-operative CT scan of cervical spine showed severe facet hypertrophy encroaching the vertebral foramen at the respective levels. All three patients underwent posterior cervical partial or complete facetectomy at the respective levels and lateral mass screw fixation and fusion with complete resolution of symptoms after the surgery. Post-operative CT scan of the cervical spine without contrast and repeat dynamic cerebral angiogram showed no compression of the artery with rotation of the head.

Conclusions

Cervical facet hypertrophy below C2 level can be a potential unique cause of vertebrobasilar ischemia (RIVAC Syndrome) that is manifested with rotation of head. RIVAC Syndrome should be strongly considered in the differential diagnosis of patients with history of cervical spondylosis or prior cervical fusion surgery that present with reproducible ischemic symptoms with rotation of head.

References

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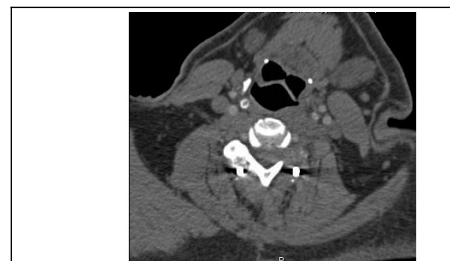
Case 3



CTA of neck in neutral position



CTA of neck with head turned to the left



Post-operative CTA of neck after left C4-5 facetectomy

Table 1. Summary of Clinical Findings

Mean Age (N=3)

- 65+/- 5 years

Gender

- Male (N=1) Female (N=2)

Location of VA Compression

- C4-5 (N=2) and C5-6 (N=1)
Uncinate process

Direction of Head Turning

Causing compression of VA

- Left (N=3)

Surgical Treatment

- Case 1: Left C4-5 Partial Facetectomy

- Case 2: Left C4-5 Partial Facetectomy

Left C3-5 facet screw fusion

and

Right C3-6 facet screw fusion

- Case 3: Left C4-5 Partial Facetectomy

Left C4-5 facet screw fusion

and

Right C3-6 facet screw fusion

Angiographic Outcome

Within 30 days

- Available in two cases (N=2)
- Excellent decompression of VA

Angiographic Outcome

Short-term and Long-term

- Case 1: Available as CTA at 18 months excellent decompression of VA

- Case 2: 3 year follow up angiogram pending

- Case 3: 6 months Angiogram shows excellent decompression of VA

Clinical Outcome

- No recurrent TIA or Stroke after the decompression of VA
- mRS of 0 in all 3 cases at mean follow-up period of 30 months (range 6 to 48 mo.)

Learning Objectives

By the conclusion of this session, participants should be able to:

- Understand the importance of cervical facet hypertrophy as a cause of rotational vertebral artery compression