

### Introduction

Blunt cerebrovascular injury (BCVI) is a potentially devastating complication of blunt trauma with an incidence of 1-3% in adult. BCVI is often clinically silent in its early phase and may only be detected once neurologic injury has occurred, making timely diagnosis and intervention essential.

Keywords: BCVI, blunt injury

### Case Description

A 40-year-old man was involved in a motorcycle-lorry collision. Despite the high-energy mechanism, he remained ambulatory after the incident. Six hours post-trauma, he was noted to have reduced consciousness and was sent to the emergency department.

On arrival, he was breathing but unresponsive. Neurological assessment revealed a Glasgow Coma Scale score of E2V2M4 with left-sided hemiparesis.

Intubation was done, and a non-contrast CT brain was performed, showing a large right middle cerebral artery (MCA) infarct with cerebral edema (Figure 1).

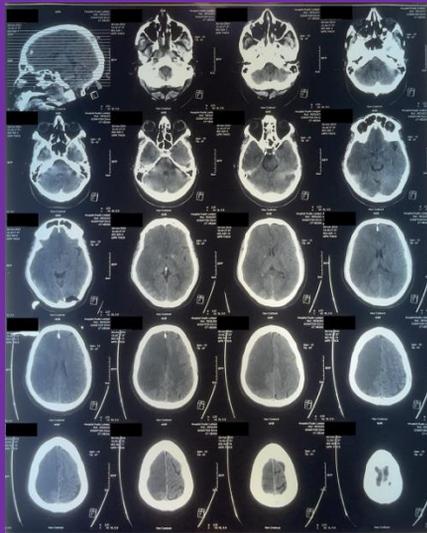


Figure 1 – Right MCA infarct with cerebral edema

Computed Tomography Angiography (CTA) of the neck was

then revealed non-occlusion of the right internal carotid artery (ICA), MCA, and anterior cerebral artery (ACA), consistent with extensive BCVI (Figure 2). Emergency decompressive craniectomy was performed.

### Discussion

This case illustrates the diagnostic challenge of BCVI, particularly in patients who appear neurologically intact at initial presentation.

In high-energy trauma, sudden hyperextension, flexion, or rotational forces can cause the internal carotid artery to stretch or compress against the cervical vertebrae<sup>1</sup>. This mechanical stress may result in intimal tears, leading to thrombosis, dissection, or complete vessel occlusion - as seen in our patient.

Despite remaining ambulatory post-accident, the patient later developed a major stroke due to carotid artery occlusion. Relying solely on clinical screening criteria may miss such injuries,



Figure 2 – non-opacification of the right internal carotid artery (arrow)

especially in high-mechanism trauma<sup>2</sup>. Early recognition and imaging may have enabled earlier antithrombotic therapy and stroke prevention. However, in this case, the patient presented with reduced

consciousness and imaging evidence of an extensive middle cerebral artery infarction, limiting the role of therapeutic intervention.

### Conclusion

Blunt cerebrovascular injury should be considered in all trauma patients with significant mechanisms of injury high vigilance, systematic screening, and prompt multidisciplinary intervention remain the cornerstones of improving survival and functional recovery in BCVI.

### References

1. Brommeland, T., Helseth, et al. 2018. Best practice guidelines for blunt cerebrovascular injury (BCVI). *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine* 26.
2. Harper, P.R., Jacobson, L.E., et al 2022. Routine CTA screening identifies blunt cerebrovascular injuries missed by clinical risk factors. *Trauma Surgery & Acute Care Open* 7, e000924.



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