

Case	(231) Craniocervical dissociation with basilar artery pseudoaneurysm
Authors	P. Encinas Escobar, S. Nagrani Chellaram, C. Cruz-conde, M. Depetris, L. Ibañez Sanz, F. Ballenilla Marco.
Centre	Hospital 12 De Octubre.

## CASE PRESENTATION

A 27 years-old female was involved in a motor vehicle accident. First responders described it as a high-energy trauma with posterior collision whilst she was inside an immobile vehicle.

The patient was found in cardiorespiratory arrest, which was reverted, stabilized and immediately referred to our trauma intensive care unit. Upon arrival, the initial evaluation showed signs of head, cervical, thoracic, abdominal and pelvic trauma. Neurological exploration was decisive, showing signs of possible intracranial mass effect/brain stem injury, which determined the necessity to undergo CT exploration prior to surgical intervention.

Non-contrast enhanced brain CT showed extensive subarachnoid hemorrhage with an aneurysmal distribution along basal cisterns, Sylvian fissures and intraventricular (Fisher IV) with acute hydrocephalus, findings that prompted the necessity for a supraaortic trunks study before the body-CT exploration.

Supra-aortic trunks CTA depicted extensive cervical bony-ligamentous complex, vascular and soft tissue trauma. Vascular trauma mainly consisted of basilar artery injury with a giant anterior pseudoaneurysm formation and poor visibility of the right vertebral artery (from V3 segment), probably due to vasospasm/dissection. Findings were accompanied by unstable cervical injury with craniocervical dissociation, avulsion fracture of the right occipital condyle and signs of atlanto-occipital and posterior cervical ligamentous complex injuries. Extensive subarachnoid/epidural cervical and prevertebral hematomas were also noted.

Body-CT study also showed major trauma signs with active bleeding, not shown in this case.

## DISCUSSION

Approximately one-third of all cervical spine injuries involve the craniocervical junction. Craniocervical dissociation is associated with high mortality rates due to brainstem and vascular lesions (1).

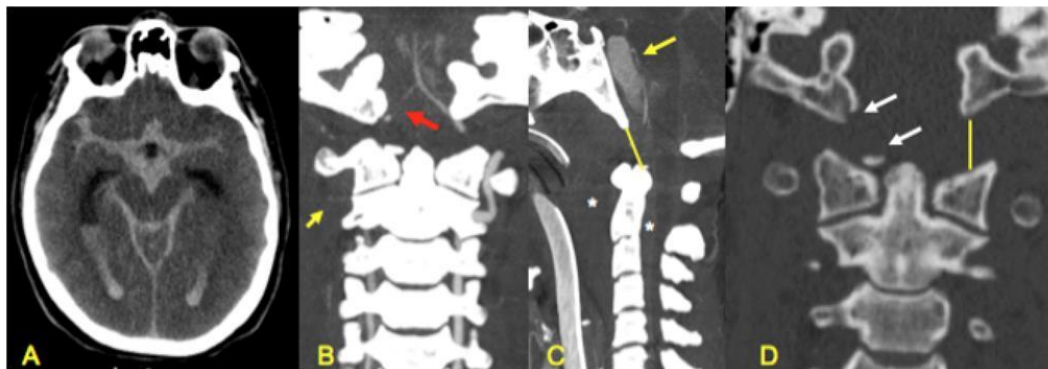
Trauma mechanism consists of a high-energy trauma with extreme cervical hyperextension (whiplash) and lateral flexion in most cases, with tectorial membrane and alar ligament injury. Clinically they can range from strong cervical pain to unconscious patients with severe neurologic deficits in the context of high-grade trauma (2).

They are classified as unstable cervical injuries, often accompanied by major brain, cervical and vascular trauma with need for a specialized multidisciplinary management. Computed tomography remains the gold standard for the evaluation of brain and cervical acute traumatic injuries.

Measurements such as basiondens interval, Powers ratio, atlanto-dental interval, among others, are of the utmost importance to avoid diagnostic errors (3).

## CONCLUSION

Cervical trauma requires paying close attention to articular intervals and soft tissue parts as injuries can range from subtle CT-findings to gross findings as in this case.



**A:** Axial non-contrast CT: Extensive subarachnoid hemorrhage with an aneurysmal distribution along basal cisterns, Sylvian fissures and intraventricular (Fisher IV) with acute hydrocephalus. **B:** CTA MIP coronal reconstruction: Right vertebral artery dissection. Absent V3 segment (yellow arrow) with irregularity of the lumen in V4 segment (red arrow). **C:** CTA MIP sagittal reconstruction: Widening of the basion-dens interval (yellow line). Giant pseudoaneurysm of the basilar artery (yellow arrow). Prevertebral and cervical hematomas (white asterisks). **D:** Coronal reconstruction: Right occipital condyle avulsion at the site of the alar ligament insertion (white arrows). Atlanto-occipital dissociation (yellow line).

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