

Case Report

Carotid Artery Transection: A Surgical Crisis

Riddhika Majumder¹, Chinmaya Ranjan Behera^{2*}, Subrajit Mishra³, P S Pujari⁴, Amaresh Mishra⁵, Pallavi Nair⁶

¹⁻⁶Department of Surgery, Kalinga Institute of Medical Sciences, Bhubaneswar, Odisha, India

*Corresponding author email: chinmayarbehera@gmail.com

	International Archives of Integrated Medicine, Vol. 8, Issue 3, March, 2021.	
	Available online at http://iaimjournal.com/	
	ISSN: 2394-0026 (P)	ISSN: 2394-0034 (O)
	Received on: 11-02-2021	Accepted on: 17-02-2021
	Source of support: Nil	Conflict of interest: None declared.
How to cite this article: Riddhika Majumder, Chinmaya Ranjan Behera, Subrajit Mishra, P S Pujari, Amaresh Mishra, Pallavi Nair. Carotid Artery Transection: A Surgical Crisis. IAIM, 2021; 8(3): 31-33.		

Abstract

Carotid Artery Injury is a life-threatening emergency. Injuries to the Carotid Artery constitute a particularly challenging subset of arterial trauma because they have the potential to produce exsanguinating hemorrhage, suffocating airway compromise and debilitating cerebral damage. The majority of patients with vascular neck injuries died at the site where the injury occurred or during transport to medical facilities. Transection of the Common Carotid Artery is very rarely encountered and most surgeons lack experience for intervention of the same. We reported a case of carotid artery injury, who presented to us in shock. Aggressive resuscitation and timely surgical intervention saved the life.

Key words

Penetrating injury, Carotid artery injury, Surgical crisis.

Introduction

Trauma remains the most common cause of death and disabilities in children and young adults in the resource-rich countries. The Advanced Trauma Life Support (ATLS) provides a structured approach to the trauma patient. It emphasizes the “golden hour” concept that timely, prioritized interventions are necessary to prevent death and disability.

Case report

A 22 year old, male MBA student was rushed to our Emergency Department in an unconscious, exsanguinated state with a history of having fallen on a glass partition of a washroom at a restaurant. He was found lying in a pool of his own blood by his friends.

He was unconscious, and his clothes were completely drenched in blood. He had a 6-7 cm

laceration in the right submandibular region of his neck, which was bleeding profusely. He had only a feeble carotid pulse (left) and no recordable Blood Pressure.

The wound was immediately packed and continuous compression was given to control the bleeding. Aggressive fluid and cardiopulmonary resuscitation was started simultaneously, and the patient was intubated in the casualty itself. He was then rushed to the emergency OT and exploration of the wound was started. Intraoperatively, we found that the right Common Carotid Artery was completely transected, near its bifurcation, with a 5cm defect between the proximal and distal ends. The repair of the artery was pursued, but due to the rapidly deteriorating vitals of the patient, the procedure had to be abandoned. Finally, the Right Common Carotid Artery and Internal Jugular Vein were ligated as a life-saving procedure (**Figure – 1**).

Figure – 1: Intraoperative picture showing the ligated right common carotid artery.



Figure – 2: Post-op MRI showing intact Circle of Willis.



Post-operatively, the patient was treated in the ICU, with inotropic, vasopressor and ventilator

support. On the second day of the surgery, he regained full consciousness with booming vitals, and thus was weaned off all supports. Thereafter he had an uneventful recovery and sustained only minor neurological deficits such as drooping of angle of mouth and deviation of tongue to the right (neuropraxia of the Right Facial and Hypoglossal nerves), along with hoarseness of voice (Right Recurrent Laryngeal Nerve palsy). An MRI Brain and Carotid Angiography, done post-operatively revealed an absent right Carotid artery with normal left Common Carotid Artery and Intact circle Of Willis, and normal brain parenchyma (**Figure – 2**).

Figure – 3: Post-operative picture.



He was discharged on the tenth post-operative day with advice for regular weekly follow ups (**Figure – 3**). On follow up there was no deviation of tongue and drooping of angle of mouth, but his hoarseness of voice persists.

Discussion

Due to the rare injury and its poor prognosis, the diagnosis and management of penetrating injuries to the cervical carotid arteries continue to be controversial issues. These include the choice of diagnostic techniques, acute management of the airway, operative exposure and management, and the role of endovascular stenting in the modern era [1].

Biffl Scale divides traumatic cerebrovascular injury into grade I–V [2]. Grade V lesions, with vessel transection are highly lethal, with a mortality rate approaching 100%, and require immediate surgical intervention. Conventional open-surgical approaches involve surgical repair or surgical ligation. Whenever possible, all attempts should be made at surgical repair, as it offers the best chance of survival with decreased risks of permanent neurologic deficits. Surgical repair can consist of primary arteriorrhaphy, end-to-end anastomosis, vein grafting, polytetrafluoroethylene (PTFE) patching, and transposition of external carotid to injured ICA [3, 4]. Surgical ligation is associated with notably higher rates of mortality and stroke and should only be reserved for situations where surgical repair is not feasible.

Our patient presented in an unconscious state with a grade 5 injury as per Biffl scale, Abbreviated Injury Scale (AIS) = 5 and hypotension. Intraoperatively, we found that the right Common Carotid Artery was completely transected, near its bifurcation. The repair of the artery was pursued, but due to the rapidly deteriorating vitals of the patient, the procedure had to be abandoned. Finally, the Right Common Carotid Artery and Internal Jugular Vein were ligated as a life-saving procedure. MR Angio

done in the post-operative period showed an intact Circle of Willis and that has contributed to the smooth recovery of this patient.

Circle of Willis, as an anastomotic polygon at the base of the brain forms an important collateral network to maintain adequate cerebral perfusion. Anomalies such as hypoplasia, accessory anterior cerebral artery, absence of posterior communicating artery and posterior cerebral artery from internal carotid artery may influence the outcome of patients with carotid artery injury.

Conclusion

Penetrating injury to the carotid artery is a life threatening emergency and requires quick action and prompt decision to save the patient. Its management requires multidisciplinary surgical approach.

References

1. Feliciano DV. Management of penetrating injuries to carotid artery. *World J Surg.*, 2001; 25: 1028-35.
2. Biffl WL, Moore EE, Offner PJ, Brega KE, Franciose RJ, Burch JM. Blunt carotid arterial injuries: implications of a new grading scale. *J Trauma*, 1999; 47: 845–853.
3. Fry R E, Fry W J. Extracranial carotid artery injuries. *Surgery*, 1980; 88(4): 581–587.
4. Reva V A, Pronchenko A A, Samokhvalov I M. Operative management of penetrating carotid artery injuries. *Eur J Vasc Endovasc Surg.*, 2011; 42(1): 16–20.