Delayed Vertebrobasilar Stroke Following Anterior Cervical Discectomy and Fusion: A Case Report and Review of Vascular Complications

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Introduction

Anterior cervical discectomy and fusion (ACDF) is a commonly performed and generally safe procedure for cervical myelopathy and radiculopathy. However, cerebrovascular complications, though rare, can be devastating. Vascular injuries during ACDF typically involve the carotid or vertebral arteries and may result in pseudoaneurysm, thrombosis, dissection, or cerebral ischemia [1–3]. The vertebral artery is particularly vulnerable due to its anatomical proximity to the surgical field, and congenital anomalies may increase this risk [4]. Atherosclerotic disease, particularly in patients with hyperlipidemia, may predispose to embolic events via plaque disruption during manipulation [1,5]. While vertebral artery dissection (VAD) is classically considered a non-atherosclerotic arteriopathy, vascular disease may elevate the risk of embolic or thrombotic events [9]. Notably, VAD-related strokes may present in a delayed fashion, sometimes occurring days after the inciting event [6–8].

Case Presentation

A 61-year-old male with degenerative cervical myelopathy underwent elective multilevel ACDF at C4-5, C5-6, and C6-7. Approximately 30 minutes after placement of the first interbody cage, intraoperative neuromonitoring (IONM) detected transient attenuation in the right upper and lower extremity signals. The surgeon was notified, and interventions included reducing anesthetic depth and confirming proper positioning. Signals returned to baseline within 20 minutes and remained stable for the rest of the procedure. No immediate postoperative deficits were noted. On postoperative day 1, the patient developed sudden-onset dysarthria, right facial droop, right-sided weakness, and hoarseness (NIH Stroke Scale: 7). CT angiography showed right vertebral artery occlusion, likely due to dissection. MRI revealed acute infarcts in the right cerebellum, left cerebellum, and left pons. Thrombolysis was contraindicated, so the patient was managed with aspirin and later transitioned to heparin in the neurocritical care unit. His course was complicated by dysphagia requiring PEG and respiratory compromise requiring tracheostomy. He enrolled in intensive inpatient rehabilitation and made substantial functional recovery over one year, ultimately regaining full motor strength and returning home with family support.

Discussion and Conclusion

This case highlights a rare but serious postoperative complication of ACDF: vertebral artery territory infarction, likely from dissection or embolism. The transient intraoperative neuromonitoring changes, which resolved with appropriate interventions, underscore the value of IONM in detecting potential neurologic or vascular compromise [8]. Although these changes did not result in immediate deficits, the subsequent delayed stroke emphasizes the need for vigilance postoperatively. While VAD is typically non-atherosclerotic, underlying vascular disease may predispose to embolic complications, particularly during surgical manipulation [5,9]. This case underscores the importance of comprehensive preoperative risk assessment and intraoperative monitoring to reduce vascular risk. In cases of postoperative neurological decline, prompt recognition and coordinated multidisciplinary care—including neurology, neurocritical care, speech-language pathology, and rehabilitation—are essential for optimal recovery [7].

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