

Floating Lateral Mass Systematic Review

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Disclosures: Addisu Mesfin, Consultant Globus, Consultant GS Medical, Speaking fees Depuy Synthes, Research Support: Medacta, Globus, OREF, Kuros. The other authors have no disclosures.

INTRODUCTION: Floating lateral mass fracture (FLM) is an uncommon subtype of cervical facet fracture involving fractures of both the superior and inferior lamina and pedicle, resulting in complete separation of the lateral mass from the vertebrae. These injuries account for 7–16% of sub axial cervical spinal fractures and frequently present with concurrent vertebral artery or neurologic injury. Most occur following high-energy trauma such as motor vehicle accidents and require immediate surgical fixation. This systematic review aimed to evaluate the epidemiology, presentation, imaging, and management strategies for FLM.

METHODS: Following PRISMA guidelines, Medline (PubMed) and Embase were searched using the terms “floating lateral mass fracture” and “cervical” or “spine.” Inclusion criteria were retrospective, prospective, or observational studies and case series with more than five patients, focused specifically on FLM. Abstracts, single-case studies, non-English publications, and broader cervical facet fracture studies were excluded. Titles and abstracts were screened by two investigators, with a third reviewer resolving disagreements. Data were extracted on patient demographics, injury characteristics, imaging, and management. Management strategies were categorized as operative or non-operative.

RESULTS SECTION: Twelve studies with 358 patients were included (65% male, mean age 41.8 years). C6 was most affected (42%), followed by C5 and C7 (23.6% each). Motor vehicle accidents accounted for 78.9% of injuries; falls and sports injuries each accounted for 8.17%. Associated injuries included spinal injury (23.1%) and head trauma (15.5%). CT was used in all studies, X-ray in 10, and MRI in 9. CT findings included vertebral displacement (56.8%), vertebral artery injury (11.8%), and facet joint widening (31.3%). Disc injury was reported in 126 patients, most often below the FLM level (50%). Ligamentous injury affected the anterior longitudinal ligament in 65.9% of cases. Neurologic deficits occurred in 131 patients, most commonly radiculopathy (62.6%). Non-operative management (n=72) most often used cervical collars (43.1%) or J-collars (37.5%), with subluxation occurring in 30.6%. Surgical management (n=237) primarily involved ACDF (28.2%), PCDF (23.6%), and two-level ACDF (23.2%). Post-operative complications (n=39) included dysphagia (35.9%), instrumentation malfunction (20.5%), infection (17.9%), and neurologic deficits (17.9%).

DISCUSSION: Findings align with prior literature on cervical facet fractures, highlighting a predominance in males, high association with high-energy trauma, and frequent C6 involvement. CT provided high diagnostic yield for both bony and vascular injury, while MRI revealed frequent disc and ligamentous damage. Non-operative treatment had high failure rates, reflecting the inherent instability of FLM. Surgical stabilization—often with two-level ACDF—was associated with lower rates of post-treatment subluxation, though dysphagia remained a common complication.

SIGNIFICANCE/CLINICAL RELEVANCE: FLM is a rare but severe cervical injury with high instability and neurologic risk. Early recognition and surgical stabilization, often two-level ACDF, are critical for optimal outcomes.

ACKNOWLEDGEMENTS: Include acknowledgements here. (Acknowledgements are Optional)