Videolaryngoscopy

Cervical spine movement during intubation with direct laryngoscopy can predispose to new-onset neurological deficits in patients with cervical spine instability. While Fiberoptic intubation (FI) is mostly preferred in such patients, this is not always possible. Videolaryngoscopy results in less cervical spine movement than direct laryngoscopy and may be an alternative to FI in patients with cervical spine instability. The objective of a study was to compare cervical spine movement during awake FI with those during awake McGrath videolaryngoscope intubation (VI) in patients undergoing surgery for cervical spine instability.

Forty-six adult patients with upper cervical spine instability scheduled for stabilization surgery were randomized to awake FI or awake VI. Cervical spine movement during intubation was assessed by changes in lateral fluoroscopic-measured angles (α and β at C1/C2 and C3 levels, respectively) at 3 time points: T1, preintubation; T2, during intubation; T3, postintubation. Motor power was assessed before and after intubation.

Patient demographics and airway characteristics were similar between the 2 groups. Cervical spine motion (in degrees) during intubation was significantly greater with VI than FI at C1/C2 (T3-T1, -8.02±8.11 vs. -1.47±3.31; P<0.001) but not at C3 (T3-T1, -2.17±5.16 vs. -1.85±3.29; P=0.960). No patient developed new-onset motor deficits following intubation in either group [1].

Cadaver and mathematical (finite element) models of a type II odontoid fracture predict C1-C2 motions during intubation to be of low magnitude, especially with the use of a low-force videolaryngoscope. Using continuous fluoroscopy, Hindman et al., recorded C1-C2 motion during C-MAC D videolaryngoscopy and intubation in 2 patients with type II odontoid fractures. In these 2 patients, C1-C2 extension and change in C1-C2 canal space were comparable to motions predicted by cadaver and finite element models and did not cause neurological injury [2].

References

1)
Dutta K, Sriganesh K, Chakrabarti D, Pruthi N, Reddy M. Cervical Spine Movement During Awake Orotracheal Intubation With Fiberoptic Scope and McGrath Videolaryngoscope in Patients Undergoing Surgery for Cervical Spine Instability: A Randomized Control Trial. J Neurosurg Anesthesiol. 2019 Mar 28. doi: 10.1097/ANA.0000000000000595. [Epub ahead of print] PubMed PMID: 30925539.
2)
Hindman BJ, Woodroffe RW, Zanaty M, Kawasaki H, Yamaguchi S, Puttlitz CM, Gadomski BC. C1-C2 Motion During C-MAC D-Blade Videolaryngoscopy and Endotracheal Intubation in 2 Patients With Type

II Odontoid Fractures: A Case Report. A A Pract. 2019 Mar 20. doi: 10.1213/XAA.0000000000001000. [Epub ahead of print] PubMed PMID: 30907749.