

[NM-316] Is Mandibular Distraction Improving Airway Management? A Retrospective Review

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Introduction: Mandibular advancement procedures using a mandibular distraction device (MDD) are increasingly being performed in infants with mandibular hypoplasia, either isolated or secondary to various syndromes such as Pierre Robin Sequence (PRS) when nonsurgical interventions prove inadequate in alleviating severe airway obstruction. Although the long term benefit from MDD in reduction of obstructive sleep apnea has been demonstrated, it is still unclear whether difficulties with intubation are persistent after the removal of the device. Two retrospective studies with over a decade of data suggest a reduced incidence of difficult intubation at the removal of MDD. In most cases, however, direct laryngoscopy (DL) alone was used. Since many more advanced airway techniques are now utilized, we reviewed our airway management in similar cases.

Methods: We searched our electronic medical records (EPIC) since 2010 to current for (MDD) insertion and removal. A retrospective chart review was conducted on patients who fit criteria. Demographic and airway related data were collected.

Results: A total of 22 patients, undergoing 43 procedures (for either MDD insertion, removal, or other operative procedures) were reviewed. Four patients were excluded due to presences of tracheostomy (N=3) and death unrelated to surgery (N=1). PRS was the reason for MDD placement in 13/18 children. The other 5 children had un-described syndromes. No difficult mask ventilation was encountered. Direct laryngoscopy, GlideScope (GS), fiberoptic intubation (FOI) and a combined use of GS and FOI were used for airway management (Table 1). Surprisingly, we found an increased number of mean intubation attempts during MDD removal vs. insertion (3.7 ± 1.56 vs. 1.9 ± 1.34), despite the improvement in mean laryngeal view grade (1.6 ± 0.97 vs. 2.1 ± 0.93). This correlates with a slight increase in airway attempts per trainees at MDD removal (57%) vs. insertion (41%).

Discussion: In our retrospective review we found a slight improvement in laryngeal airway view similar to previous published data. At the same time, the number of intubation attempts had increased. These conflicting results might be explained by lack of airway management and provider standardization so that different devices have been used at insertion and removal of the MDD both by attendings and trainees. In our patients, there was a tendency for use of advanced airway techniques (GS, FOI) especially for training purposes. Future prospective studies with standardized protocols are needed to clarify the effect of MDD on subsequent airway management.

References:

1. Frawley, G et al. Pediatric Anesth 2012
2. Brooker, GE, et al. Anesth Int Care. 2010

| | Mandibular Distraction Insertion | Mandibular Distraction Removal | Post Removal Procedure # 1 | Post Removal Procedure #2 |
|--|--|--------------------------------------|----------------------------------|---------------------------------|
| NUMBER | 17 | 14 | 10 | 2 |
| AGE – months, (mean) | 0.5-108 (13.6) | 1.5-108 (19.7) | 3-24 (10.1) | 6-24 (15.0) |
| GENDER (M/F) | 11 (65) / 6 (35) | 10 (71) / 4 (28) | 7 / 3 | 2 / 0 |
| TOTAL ATTEMPTS (mean ± SD) | 1.9±1.34 | 3.7±1.56 | 1.3±0.67 | 3±2.8 |
| SUCCESSFUL DEVICE -numbers, (%) | | | | |
| > DL | 11 (65) | 7 (50) | 8 (80) | 1 |
| > GS | 2 (11) | 5 (35) | 2 (20) | 0 |
| > FOI | 4 (23) | 2 (14) | 0 | 1 |
| LARYNGEAL VIEW GRADE (mean) | 2.1±0.93 | 1.6±0.97 | 1.3±0.48 | 2.5±2.12 |
| SUCCESSFUL INTUBATION PROVIDER | | | | |
| > ATTENDING - numbers, (%) | 10 (59) | 6 (43) | 6 (60) | 1 |
| > TRAINEE - numbers, (%) | 7 (41) | 8 (57) | 4 (40) | 1 |