Multidisciplinary Approach to Managing Difficult Airways in Emergency Departments

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Background

Definitive airway management is an essential and life-saving part of emergency medicine.

The difficult airway arises when an experienced airway provider is unable to ventilate or intubate using direct laryngoscopy. Prior research report a 2.3% incidence of difficult airway in operative settings;[1] with some limited evidence suggesting higher rates of 10.3% in areas outside of the operative room.[2] The risk of morbidity and mortality is high in this population but the stakes are higher.

The Johns Hopkins Hospital developed a multidisciplinary airway program (DART) to respond to hospital-wide difficult airways.[3,4]

The purpose of this study is to review and report the experience of the DART program in the Emergency Department at an academic, tertiary care institution and the what the clinical outcomes were.

Methodology

Design: Quality Improvement Study

Setting: Academic, tertiary care institution

Intervention: Multidisciplinary Difficult Airway Response Team

Data Collection: Retrospective chart review

Inclusion Criteria: 18 years or older and managed by the DART in the emergency room to establish an airway, between July 2008 to June 2013.

Results: Patient Demographics

Age		50.1 ± 16.5
Sex	Women	41 (41.8)
	Men	57 (58.2)
Race	Caucasian	17 (17.3)
	African American	76 (77.5)
	Hispanic	1 (1.0)
	Asian	2 (2.0)
	Middle Eastern	2 (2.0)
BMI kg/m² (n = 86)		32.0 ± 12.4

The predominant ethnicity was African American, followed by Caucasian. Although, obesity has been reported to be risk factor for difficult airways in previous research we found a large number of patients with BMI < 35 exhibit difficult airway.

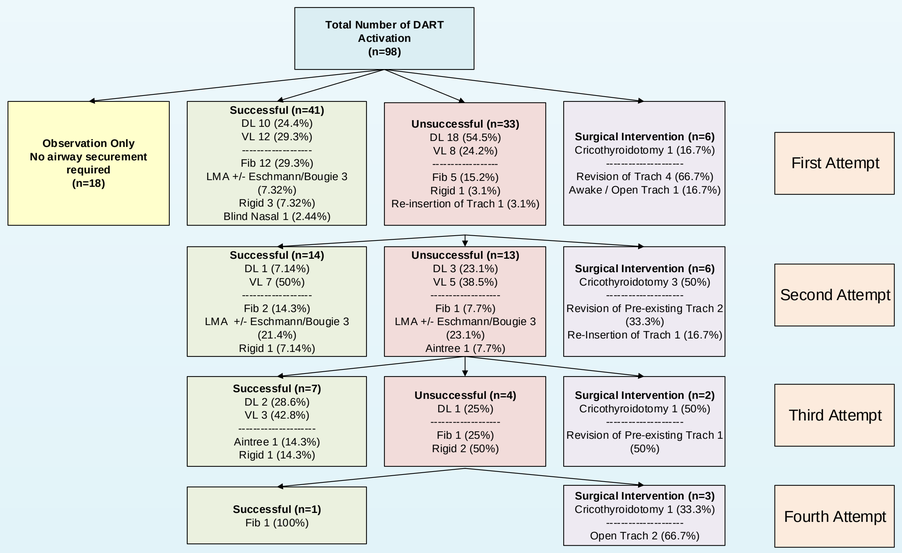
Results: Patient Characteristics

Indication for DART call	Current/active Difficult Intubation	35 (35.7)
	History of Difficult Intubation and Current Difficult Intubation	11 (11.2)
	History of Difficult Airway Identified	1 (1.0)
	Call Cancelled	2 (2.0)
	Anticipated Difficult Airway without history of DA	49 (50.0)
History or current presence of head and neck tumor	Absent	88 (89.8)
	History of tumor but not presently active	5 (5.1)
	Active tumor	3 (3.1)
	Post Radiation to Head and Neck	1 (1.0)
	Post Head and Neck Surgery	1 (1.0)

Emergency Medicine physicians were able to anticipate difficult airway and activate DART in 50% of the DART calls in the absence of history or documentation of previous difficult airway.

The reason for anticipated calls are generally reflective of known difficult airway pathologies including angioedema, trauma, and anaphylactic reactions. The other primary indication for DART calls were signs of an active difficult airway that required DART expertise.

Results: Assessment of Techniques



Of the 98 patients, 18 patients were evaluated by DART and did not require intubation. 80 patients' airways were secured via intubation or surgical techniques.

The most successful technique for airway securement was Fiberoptic intubation.

The maximum number of attempts required to establish an airway by the DART was 4 attempts.

Videolaryngoscopy was the most common successfully utilized rescue technique (n = %) and the most common unsuccessful technique among patients with difficult airway was direct laryngoscopy.

Results: Discussion

Most DART calls are related to emergent airways associated with pulmonary conditions, angioedema, and trauma.

Fiberoptic intubation was most commonly used advanced airway technique for successful airway securement with a low failure rate.

For patients with a tracheotomy tube in place, the reason for DART activation was predominantly dislodgement of the tube that occurred prior to the arrival to Emergency Department.

For the first attempt, 56% of the patients required advanced airway skillset not routinely part of Emergency Medicine expertise. Subsequent attempts utilized advanced skillset.

Our analysis was limited by a retrospective study design. Future studies in this area also should consider correlations between mortality utilizing prospective methodologies.

Conclusion

Emergency Physicians are skillful in identifying and managing patients with difficult airway. Our data also highlight that multidisciplinary DART is successful way to manage patients with difficult airway.

However, we recognize challenges with creating similar protocols in resource restricted environments.

Notably, our data suggests that the use of Fiberoptic intubation technique was particularly successful in many difficult airways in the emergency department.

This may represent an opportunity for expansion in Emergency Medicine core training and education, and requires further research.

References

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