



GETTING CAUGHT IN LARYNGEAL WEB ; 2 CASE REPORTS WITH NARRATIVE REVIEW

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ABSTRACT

Laryngeal web could be an incidental finding during Endotracheal intubation in adults and can cause unanticipated difficult intubation leading to morbidity and mortality. Here we have discussed 2 cases which had difficulty during intubation although the airway assessment during preanesthetic evaluation was within normal limits. Post procedural investigations showed Subglottic web, the probably causes in the below discussed case reports could be systemic diseases and acid gastric reflux.

KEYWORDS : Laryngeal Web, Difficult Intubation

INTRODUCTION

Unanticipated difficult intubation is associated with significant morbidity and mortality. ASA defines difficult airway as a clinical situation in which conventionally trained anesthesiologist experiences difficulty with face mask ventilation of the upper airway, difficulty with tracheal intubation or both¹. The unanticipated difficult airway which we encountered in these two cases presents a crisis situation in which human factors contribute to 40% of adverse outcomes. Incidental asymptomatic laryngeal webs have always puzzled anesthesiologists with varied presentations and are identified on direct laryngoscopy done after induction of anesthesia². It is a rare anomaly, mostly congenital in origin with incidence of 1:10,000³. But in adults, it is an incidental finding, seen during ETT intubation, where it becomes difficult to pass the appropriate size ET tube⁴. These cases pose multiple challenges to the anesthesiologists

a)As an incidental finding during intubation leading to unanticipated difficult airway. b)Presenting as bronchospasm during general anesthesia with supra glottic airway devices c)Fire hazards due to CO2 lasers which is used in resecting the laryngeal web.

This paper aims at highlighting difficult airway society 2015 guidelines for management of unanticipated difficult intubation.

METHODOLOGY

We experienced 2 cases in MVJ Medical College which had difficulty during intubation although the airway assessment during preanesthetic evaluation was within normal limits. Post procedural investigations showed Sub-glottic web.

CASE REPORT 1: A 56 year old male with subacute intestinal obstruction posted for an emergency laparotomy, had inter incisor gap of more than 3 fingers, Malampatti grade2, TMD of 10 cm, neck circumference 34cm, height 170cm, BMI of 27.5kg/m² and no features suggestive of difficult airway. After pre-oxygenation, induction, adequate mask ventilation, Succinylcholine was given followed by direct laryngoscopy which revealed a Cormach Lehane grade II. First attempt to intubate with cuffed endotracheal tube size 8 failed. Second and third attempt with tube 7,6,5 respectively was also unsuccessful. Patient was intubated in fourth attempt with ET tube 6. There was no difficulty in extubation. Retrospectively a CT scan of neck revealed a subglottic web.

CASE REPORT 2: A 48yr old female with no co-morbidities was posted for an elective open cholecystectomy. A preoperative airway examination revealed adequate inter incisor gap of more than 3 fingers, Malampatti grade1, adequate inter incisor gap of 3

fingers, TMD of 9cm, neck circumference 32cm, height 158cm, BMI of 24.3kg/m² and no features suggestive of difficult airway. The only significant history was she suffered from symptoms of Acid Peptic Disease. Following pre-oxygenation and induction, adequate mask ventilation was confirmed. Succinylcholine was given and was followed by direct laryngoscopy which revealed Cormach Lehane view 1. First attempt to pass the tube 7.5 CETT was unsuccessful as the tube could not be passed beyond the glottis, with the second attempt with 6.5 also failed. A third attempt with a 6 size CETT resulted in successful endotracheal intubation. There was no difficulty in extubating the patient after the procedure. Post operatively the patient was subjected to CT Neck which revealed a Sub-glottic web.



CASE REPORT 1



CASE REPORT 2

After that, thorough and comprehensive literature search in medical databases {PubMed, Google Scholar} was performed without any data restriction including case reports, observational studies, randomized controlled trials (RCTs) and review articles. Keywords used during search was unanticipated difficult intubation, difficult airway, laryngeal web and difficult intubation. However, most of the evidence we found in the 29 case literature was in the form of case reports and 1 review article. Cases tabulated according to age into neonate, paediatric and adults.

Table 1- Neonate

NO	AGE	PRESENTATION	MANAGEMENT
1	12 hours	Posted for colostomy	Failed with UCETT 3.5,3,2.5,2. Managed by BMV
2	18 hours	H/O choking, difficulty in breathing, increased secretions	Failed with UCETT 3,2,5, 2. Managed by infant feeding tube and stylet
3	2 days	Posted for trachea-esophageal repair	Failed with 14 size Cole tube and lesser size. successful with 10 size
4	1 month	Posted for surgery	Failed with DL. Managed with CMAC video laryngoscope

5	2 months	Posted for inguinal hernia	Failed with UCETT 2,3.Surgery postponed
6	12 months	Posted for bilateral club foot repair	Failed with UCETT.managed by LMA - Igel

Table 2 – Paediatric

NO	Age/ Sex	PRESENTATION	INITIAL FAILED MANAGEMENT	FINAL MANAGEMENT
1	15 months	Case of web	UCETT 2,5,2	Tracheostomy
2	4 years	Web excision	UCETT 4,5,4	UNCETT 3,5
3	4 years	Vitreal retinal surgery	UCETT 4,3,5,3	UNCETT 2,5
4	5 years	Respiratory distress	Difficulty extubation	Extubation difficult
5	9 years	Aretenoidectomy	UCETT 4,5,4	UNCETT 3
6	11 years	Urinary surgery	UCETT 5,4,5,4,3,5	UNCETT 3
7	12 years	Laryngeal keel surgery	UNCETT 5	UNCETT 4,5

Table 3 – Adult

NO	Age/ Sex	PRESENTATION	INITIAL FAILED MANAGEMENT	FINAL MANAGEMENT
1	17/F	post traumatic injury repair	CETT 6,5,6,5,5	LMA
2	20/F	Surgery for laryngeal web	CETT 6,5,6,5,5	LMA
3	25/F	Cesarian section(LSCS)	CETT 7,6,5	CETT 6
4	33/M	Open thoracotomy	Double lumen LMA	Single lumen LMA
5	38/M	Surgery	CETT 8,7,5,7,6	LMA
6	43/F	TAH	CETT 6,5,6	LMA
7	44/F	TAH	CETT 7,5,7	CETT 6,5
8	45/F	MRRM	CETT 7,5, 7	CETT 5
9	45/F	Emergrncy laprotomy	CETT 6,5,6	Tracheostomy
10	45/F	Surgery	CETT 7,5,7	CETT 6,5
11	50/F	DM, CAD	CETT 7,5,7,6	CETT 5,5
12	51/F	Elective tooth extraction	CETT 7,6,5,6	LMA
13	60/F	Surgery	CETT 7,6,5,6	LMA-Fastrach
14	63/F	TURP and cystoscopy	CETT 8,5,8	CETT 7
15	65/F	Radical nephroureterectomy	CETT 7,5,7,6,5	CETT5
16	65/M	Biopsy	CETT 7,6,4,5,4	CETT 3,5

UCETT- uncuffed endotracheal tube ; BMV- bag and mask ventilation; CETT - cuffed endotracheal tube

DISCUSSION

Laryngeal web may be congenital or acquired. The incidence of congenital laryngeal web has been estimated around 1 in 10,000 live births³. Congenital laryngeal webs are uncommon constituting 5% of all congenital laryngeal lesions⁵. They may be associated with some syndrome like Di-george syndrome, Velo cardio facial syndrome. Laryngeal webs are mainly located at the level of vocal cord{75%} some being either sub or supraglottic⁶. Majority of these lie anteriorly between the cords, only 1-2 % are located posteriorly⁵. It can be discovered in asymptomatic adults under anaesthesia and are associated with failed intubations.Varied presentations under anaesthesia range from failed intubation to post-operative obstruction requiring emergency tracheostomy⁶.

Laryngeal web is suggested by clinical symptoms such as stridor, hoarseness of voice, weak cry (neonate), respiratory distress and feeding problems, but endoscopic vision is essential for a definite diagnosis⁵. Laryngeal web may be misdiagnosed as obstructive lung disease such as bronchial asthma or COPD especially when they are located subglottic⁷. Some patients remain asymptomatic and may present as unanticipated difficult intubation⁸.

It is a rare malformation in which abnormal fibrous tissue forms between two structures within the larynx. This malformation results from incomplete recanalization of the primitive larynx during the

tenth week of embryogenesis⁹. In case of an acquired web, the history can be that of infection, intubation, trauma, reflux, or laryngeal surgery (especially when laser is used). The association of these two factors—laryngeal laser procedures and reflux—is recognized as a significant risk factor for the formation of webs⁹.

MANAGEMENT

Airway management of unsuspected laryngeal web is clinically the same as managing patients with sub- glottic stenosis. Different sizes of tracheal tube should be available during induction of anaesthesia and the tracheal tube should not be advanced with force when resistance is encountered. Further traumatic injuries to the cords should be avoided as it may induce scarring and enhance web formation in the future, especially if both sides of the cords are injured¹¹.

Web formation in the posterior commissures has been reported after intubation in paediatric patients⁴.If this is encountered, it is best to awake the patient, postpone the operation and consult an otolaryngologist for evaluation of the airway anatomy³.

For emergency surgery, examination of the larynx with a flexible fiberoptic laryngoscope under local and topical anaesthesia before re-attempting intubation may minimize traumatic injuries to the vocal cords¹². Increased risk of laryngospasm, trauma and distressing iatrogenic airway obstruction while participating in awake fiberoptic laryngoscopy should always be borne in mind⁶. Anaesthesia via a laryngeal mask, which is not traumatic to the vocal cords, would be an alternative choice. Another important point is postoperative follow-up of the patient as local bleeding, oedema and further formation of web may occur. The patient should be warned of these complications and the condition should be mentioned to the surgeon and anaesthetist if surgery is contemplated in the future⁵.Most of the cases of laryngeal web are managed by placing a smaller endotracheal tube. Cases where endotracheal tube tube could not be advanced, required emergency tracheostomy⁸.Management of laryngeal webs ranges from observation to emergent tracheotomy⁴.

Table-4

Thin Webs	<ul style="list-style-type: none"> • Endoscopic lysis using a cold knife or laser. • Endoscopic suturing of the cut edges • Placement of a keel may prevent restenosis
Thick Webs	• Laryngofissure approach, with postoperative stenting of the airway, to remove redundant soft tissue.
Webs Without Clinical Symptoms	Not treated as the incised and divided adjacent cords may adhere together because of scaring ⁴

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A simplified, single algorithm covers unanticipated difficulties in both routine intubation and rapid sequence induction and hence should be regularly rehearsed and made familiar to whole theatre team.Emphasis is placed on assessment, preparation, positioning, preoxygenation, maintenance of oxygenation, and minimizing trauma from airway interventions. It is recommended that the number of airway interventions are limited, and blind techniques using a bougie or through supraglottic airway devices have been superseded by video- or fibre-optically guided intubation. If tracheal intubation fails, 2nd generation supraglottic airway devices are recommended. When both tracheal intubation and supraglottic airway device insertion have failed, waking the patient is the default option. If at this stage, face-mask oxygenation is impossible in the presence of muscle relaxation,scalpel cricothyroidotomy should follow immediately.¹³

CONCLUSION

Preoperative normal airway assessment and post induction ventilation assures and leads to a state of complacency which can be disastrous. Difficult air way society guidelines for unanticipated difficult airway should be rehearsed and employed as and when the

situation demands.

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