International Journal of Health Sciences and Research
www.ijhsr.org ISSN: 2249-9571

Case Report

Anticipated Difficult Airway in Posterior Neck Swellings: A Report of Two Cases and Literature Review

Hemraj Tungaria[1], Basant K. Dindor[1], Lalit K. Raiger[2], Shekhar Suman Saxena[3], Shuchi Mathur[3]

[1]Assistant Professor, [2]SeniorProfessor, [3]Junior Resident,
Department of Anesthesia, R.N.T. Medical College, Udaipur, Rajasthan, India.

Corresponding Author: Hemraj Tungaria

Received: 17/01/2016 *Revised: 12/02/2016* *Accepted: 16/02/2016*

ABSTRACT

Managing a case of anticipated difficult airway successfully is like a dream come true for an anesthesiologist. We should have a good airway assessment to identify patients who may have difficult airways, at the same time knowing alternate approaches to airway management. We here intend to describe how we managed two cases of anticipated difficult airway in males both having posterior neck swelling with restricted neck movements. This report will exemplify the importance of workup for anticipated difficult airway including importance of considering predictors of difficult airway, preoperative awake direct laryngoscopy at the same time making availability of skilled anesthetist and difficult airway cart.

Keywords: Posterior neck swelling, anticipated difficult airway, predictors of difficult airway, Mallampati grading, Cormack and Lehane grading, Lemon Law.

INTRODUCTION

Neck swelling poses a great challenge to anesthesiologist for various concerns related to airway. We should always have a plan in our mind in order to anticipate and manage these patients with difficult airway, starting from history to preanesthetic checkup and then intraoperatively to successful discharge. We report two cases of difficult intubation in elderly males both having posterior neck swelling with restricted neck movements. In both cases preoperative awake laryngoscopy was done to access the airway and predict difficulty in laryngoscopy and intubation. In case I intubation was done on third attempt in lateral position with change of blade, use of BURP maneuver and stylet. In case II intubation was done in second attempt with change of blade and use of stylet. In both cases patients were successfully extubated and discharged from operation theatre. Thus both the case reports will highlight the importance of knowing the predictors of difficult airway, basic airway maneuvers and skills at the same time making availability of skilled anesthetist and difficult airway cart in O.T.

CASE REPORT 1

A 62 yr. old male presented for the preanesthetic checkup in OPD with massive swelling in posterior side of neck (figure 1, 2). The swelling was present since 4 years, gradually increasing in size to attain the present one with the dimensions 30×18×15cms in size, with the complain of pain since 3 months. The swelling was firm in consistency with a shallow ulcer of 8×15 cms. Patient had difficulty of neck extension. FNAC and CT Neck were suggestive of lipoma.

His pre anesthetic airway examination revealed loose lower central

incisors. Mouth opening was decreased with Mallampati grade III. He had reduced Atlanto occipital joint extension (grade 1). Rest of the systemic examination was within normal limits.

Figure 1,2: Showing swelling in posterior neck region, making difficult for patient to extend AO joint.

Patient taken for planned surgery under General Anesthesia, considering him in ASA II. As we anticipated difficult airway, direct laryngoscopy was done preoperatively after spraying lignocaine 10 % on laryngopharyngeal area, which showed Cormack and Lehane grade III view. As we did not had fiberoptic laryngoscope our difficult airway cart had: McCoy blade laryngoscope, Stellate, LMA classic, Tracheostomy and cricothyroidotomy kit.

On O.T table all routine monitoring like NIBP, Pulse Oximetry, ECG and $EtCO_2$ were applied. Two 18G IV lines were secured, patient was premedicated with Inj.Ondensetron 4mg, Inj. Glycopyrolate 0.2mg, Inj. Fentanyl 50 µg iv, Inj. Lignocaine 2% 1.5ml for i/v use and was preoxygenated with 100% O_2 for three minutes via Bain's circuit and mask in left lateral decubetus position. Anesthesia was then induced with Inj. Propofol 100 mg iv and inj. Succinylcoline 100 mg. First intubation attempt was made by junior ragistrar in same position but failed as laryngeal aperture was was not seen, second attempt was tried by senior ragistrar but again it failed and saturation decreased to 70%. Patient was immediately ventilated with Bain's circuit and mask.

Third attempt was tried after giving Inj propofol 30 mg and when 100 % saturation achieved, this time senior anesthetist used McCoy blade and stylet with BURP manauver (Backward Upward and Rightward Pressure on Larynx). With Direct laryngoscopy only, posterior part of Vocal cords were seen and trachea intubated with cuffed endotracheal tube no. 8 with stellate. Intubation was confirmed with $EtCO_2$ tracingand bilateral chest auscultation.

After intubation Inj. Vecuronium 4 mg IV was given, patient was placed in prone position(figure 3), auscultation was repeated to confirm bilateral equal air entry.

Figure 3 : Patient place in prone position after intubation

Figure 4 : Showing the excised swelling

Anesthesia was maintained with O_2 and nitrous oxide, halothane and intermittent boluses of Inj. Vecuronium 1mg. Lipoma was removed, specimen sent for histopathological examination. A soft tissue mass weighing 3 Kg was excised (figure 4). Vitals remained stable throughout the surgery with no major blood loss. After the surgery which lasted for 1.5 hrs anesthesia was reversed with inj. Neostigmine 2.5mg and inj. Glycopyrrolate 0.4 mg. Patient was successfully extubated after achieving adequate muscle power and respiration and sent to surgical ICU.

CASE REPORT 2

A 70 yrs male came for preanesthetic checkup in OPD for excision of lipoma in posterior neck region left side (figure 5,6). The swelling was present since 3 years, gradually increasing in size to attain the present one with the dimensions 10*6cms in size, positive slip sign, hard in consistency and non-mobile, with the complain of pain since 3 months. He had history of smoking since 25 yrs and was on salbutamol inhaler SOS. His vital were within normal limits.

FNAC finding was suggestive of lipoma. MRI report (Figure 7) revealed large well defined lesion left paravertebral region extending up to skin and suggestive of lipoma. It also showed posterior osteophyte disc complexes from C3-C4 to C5-C6 causing indentation on vertebral aspect of thecal sac with narrowing of bilateral neural foraminae.

Figure 5,6: Showing swelling in posterior neck region left side, making difficult for patient to extend AO joint.

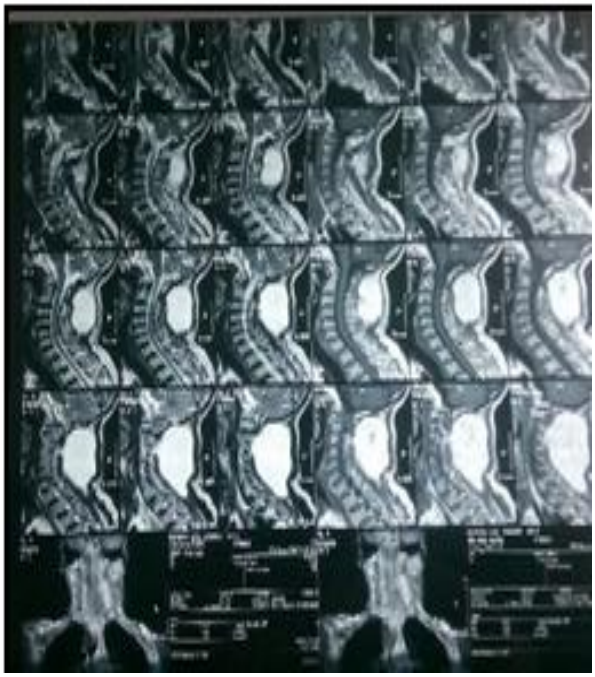

Figure7: Showing MRI scans

On examination his spines were fused, had multiple missing teeth with loose lower central incisors. Mouth opening was adequate with Mallampati grade II. He had decreased air entry bilaterally on auscultation with presence of wheeze in right lower zones. He had reduced Atlan to occipital joint extension (grade II). Rest of the systemic examination was within normal limits.

Patient was optimized for respiratory findings and taken for planned surgery under General Anesthesia, considering him in ASA II. As we anticipated difficult airway, direct laryngoscopy was done preoperatively after spraying lignocaine 10 % on laryngopharyngeal area, which showed Cormack and Lehane grade III view. As we did not had fiberoptic

laryngoscope our difficult airway cart had: McCoy blade laryngoscope, Stellate,LMA classic, Tracheostomy and cricothyroidotomy kit.

On O.T. table all routine monitoring like NIBP, Pulse Oximetry, ECG and $EtCO_2$ were applied. Two 18G IV lines were secured, patientwas premedicated with Inj.Ondensetron 4mg, Inj. Glycopyrolate 0.2mg, Inj. Fentanyl 50 µg iv and was preoxygenated with 100% O_2 for three minutes via Bain's circuit and mask. Anesthesia was then induced with Inj. Propofol 100 mg iv. As we were able to mask ventilate him successfully Inj.Succinylcholine 100 mg was given and first intubation attempt was made but failed as laryngeal opening was anterior and only epiglottis was seen, saturation decreased to 56%. Patient was immediately ventilated with Bain's circuit and mask.

Second attempt was tried after giving Inj propofol 30 mg and when 100 % saturation achieved, this time senior anesthetist did external laryngeal manipulation (figure 8) deviating larynx towards right side. Direct laryngoscopy was done with McCoy blade, Vocal cords were seen and trachea intubated with cuffed endotracheal tube no. 8 with stellate. Intubation was confirmed with $EtCO_2$ tracing (figure 9) and bilateral chest auscultation.

After intubation Inj. Vecuronium 4 mg IV was given, patient was placed in prone position, auscultation was repeated to confirm bilateralequal air entry. Anesthesia was maintained with O_2 and nitrous oxide, halothane and intermittent boluses of Inj. Vecuronium 1mg. Lipoma was removed, specimen sent for histopathological examination. A soft tissue mass weighing 0.5 Kg was excised (figure 10,11). Vitals remained stable throughout the surgery with no major blood loss. After the surgery which lasted for 1.5 hrs anesthesia was reversed with inj. Neostigmine2.5mg and inj. Glycopyrrolate 0.5 mg. Patient was successfully extubated after achieving adequate muscle power and respiration and sent to surgical ICU.

Figure 8,9: Showingexternal laryngeal manipulation and $EtCO_2$ tracing.

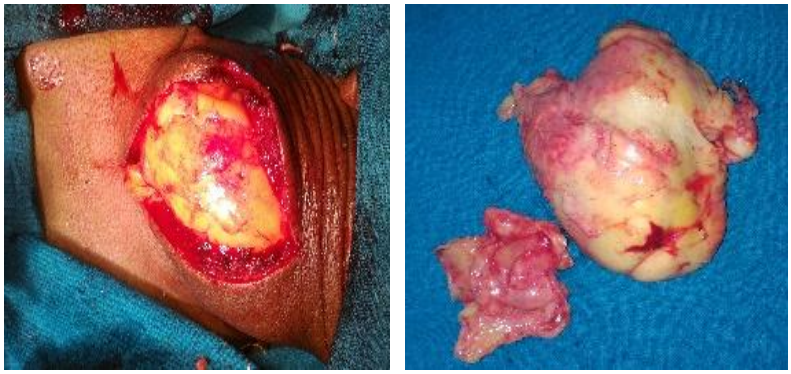

Figure 10,11 : Showing the excisedswelling

DISCUSSION

Lipoma is a slow growing benign tumor of adipose tissue and can occur anywhere in the body. Hence, it is also known as universal or ubiquitous tumor. [(1)] Usually, Lipomas develop on the extremities and trunk. However 13% of Lipomas grow in the head and neck region. [(2)] Here they can lead to airway abnormality and can pose a challenge to the anesthetist for securing the airway.

There are various definitions of "the difficult airway", with no definition universally accepted. In general terms, an airway is considered difficult when oxygenation and ventilation cannot be achieved in the desired manner. [(3)]

American Society of Anaesthesiologist Task Force definitions: [(4)]

1. The difficult airway is "the clinical situation in which a conventionally trained Anesthesiologist experiences difficulty with facemask ventilation, difficulty in Supraglottic device ventilation, difficulty in tracheal intubation or all three".
2. Difficult mask ventilation as occurring when "it is not possible for the unassisted anaesthesiologist to maintain oxygen saturation more than 90% using 100% oxygen and positive pressure mask ventilation in a patient whose oxygen saturation was more than 90% before anaesthetic intervention; and/or, it is not possible for the unassisted anaesthesiologist to prevent or reverse signs of inadequate ventilation during positive pressure mask ventilation"
3. Difficult laryngoscopy occurs when "it is not possible to visualize any portion of the vocal cords with conventional laryngoscope." This usually corresponds to a Cormack and Lehane's Grade IV laryngoscopic view.
4. Difficult endotracheal intubation occurs "when proper insertion of the tracheal tube with conventional laryngoscopy requires more than three attempts or more than 10 minutes"

Respiratory events are the most common anaesthetic related injuries. The three main causes of respiratory related injuries are inadequate ventilation, esophageal intubation and difficult tracheal intubation. [(5)] Difficult tracheal intubation accounts for 17% of the respiratory related injuries and results in significant morbidity and mortality. In fact up to 28% of all anaesthesia related deaths are secondary to the inability to mask ventilate or intubate. [(6)]

A thorough evaluation and meticulous planning including history, physical examination, proper airway assessment, availability of experienced anesthetist and difficult airway cart must be included when anticipating difficult airway. Important facets of a complete airway evaluation which must be considered when difficulty is anticipated with airway management include predictors of difficult face mask ventilation, video laryngoscopy, use of a Supraglottic device, and cricothyrotomy. [(7)]

We should know what the *basic predictors of difficult airway* are:

1. Mouth opening: inter-incisor distance (at least 2 large finger breadths is desirable;

2. Predictors of difficult face mask ventilation: (i) Presence of beard, (ii) Obesity, (iii) Lack of teeth, (iv) Sleep apnea and snoring, (v) Elderly patients.

3. Mallampati Test: [(8)] it indicates the amount of space in the oral cavity to accommodate the laryngoscope and endotracheal tube and correlates tongue size to pharyngeal size;

Grade I: Visualization of the soft palate, fauces; uvula, anterior and the posterior pillars.

Grade II: Visualization of the soft palate, fauces and uvula.

Grade III: Visualization of soft palate and base of uvula.

Grade IV: Only hard palate is visible. Soft palate is not visible at all;

4. Atlanto occipital joint (AO) extension:

It assesses feasibility to make sniffing or Magill position for intubation i.e. alignment of oral, pharyngeal and laryngeal axes into an arbitrary straight line. The patient is asked to hold head erect, facing

directly to the front, then he is asked to extend the head maximally and the examiner estimates the angle traversed by the occlusal surface of upper teeth. Measurement can be by simple visual estimate or more accurately with a goniometer. Any reduction in extension is expressed in grades:
Grade I : >35°
Grade II: 22°-34°
Grade III: 12°-21°
Grade IV: <12°. (Normal angle of extension is 35° or more), [9,10]

5. Mandibular space:

a. Thyromental (T-M) distance (Patil's test): [11] It is defined as the distance from the mentum to the thyroid notch while the patient's neck is fully extended. This measurement helps in determining how readily the laryngeal axis will fall in line with the pharyngeal axis when the atlanto-occipital joint is extended. Alignment of these two axes is difficult if the T-M distance is < 3 finger breadths or < 6 cm in adults; 6-6.5 cm is less difficult, while > 6.5 cm is normal;

b. Sterno-mental distance: [12] estimated the distance from the suprasternal notch to the mentum and investigated its possible correlation with Mallampati class, jaw protrusion, interincisor gap and thyromental distance. It was measured with the head fully extended on the neck with the mouth closed. A value of less than 12 cm is found to predict a difficult intubation;

c. Mandibulo-hyoid distance: [13] Measurement of mandibular length from chin (mental) to hyoid should be at least 4 cm or three finger breadths. It was found that laryngoscopy became more difficult as the vertical distance between the mandible and hyoid bone increased;

d. Inter-incisor distance: It is the distance between the upper and lower incisors. Normal is 4.6 cm or more; while >3.8 cm predicts difficult airway;

6. LEMON Law: [14,15] The score with a maximum of 10 points is calculated by assigning 1 point for each of the following **LEMON criteria:**

L= Look externally (facial trauma, large incisors, beard or moustache, large tongue)
E= Evaluate the 3-3-2 rule (incisor distance-3 finger breadths, hyoid-mental distance-3 finger breadths, thyroid-to-mouth distance-2 finger breadths)
M= Mallampati (Mallampati score > 3).
O= Obstruction (presence of any condition like epiglottitis, peritonsillar abscess, trauma).
N= Neck mobility (limited neck mobility) Patients in the difficult intubation group have higher LEMON scores;

7. Direct laryngoscopy: [16] Difficulty in intubation can be classified according to the view obtained during direct laryngoscopy into 4 grades. These 4 grades of laryngoscopic views were defined by Cormack and Lehane:
Grade I - Visualization of entire laryngeal aperture.
Grade II - Visualization of only posterior commissure of laryngeal aperture.
Grade III - Visualization of only epiglottis.
Grade IV - Visualization of just the soft palate. Grade III and IV predict difficult intubation.

In both the cases, we could successfully secure the airway as we anticipated it to be difficult by considering the importance of Predictors of difficult airway preoperatively, doing awake direct laryngoscopy preoperatively and at the same time making the availability of senior anesthetist in O.T with difficult airway cart ready.

In case I though the first intubation attempt with Macintosh blade was unsuccessful, but by doing bag and mask ventilation we could normalize the saturation. By simple BURP maneuver, use of McCoy blade and stylet for endotracheal tube by senior anesthetist we could intubate the patient successfully third time.

In case II we could intubate the patient successfully second time by simple BURP maneuver, use of McCoy blade and stylet for endotracheal tube, also we gave scoline only after confirming that bag and mask ventilation was effective.

One should always try to have $EtCO_2$ monitors which can help in excluding oesophageal intubation at the same time tell about the effectiveness of bag and mask ventilation. So one should also keep in mind that anyone can fall in cannot intubate cannot ventilate situation and always keep difficult airway cart ready and avaiibility of skilled anesthetist.

CONCLUSION

Our case report emphasizes the importance of perioperative workup for anticipated difficult airway, minimizing perioperative complication, by knowing basic predictors of difficult airway, various monitoring devices to support airway management, availability of skilled and experienced airway manager, rational decision making in difficult airway situation with the simple maneuvers and best available equipments.

We should always keep in mind that no single test or airway predictor is specific or sensitive for anticipating difficult airway, so anesthesiologist must always be prepared in these situations with pre formulated plan or practiced institutional protocol.

REFERENCES

1. C. Davis Jr. and J. G. Gruhn, "Giant lipoma of the thigh," Archives of Surgery, vol. 95, no. 1, pp. 151–156, 1967.
2. M. H. A. El-Monem, A. H. Gaafar, and E. A. Magdy, "Lipomas of the head and neck: presentation variability and diagnostic work-up," Journal of Laryngology and Otology, vol. 120, no. 1, pp. 47–55, 2006.
3. Airway assessment-www.google.com-httplifeinthefastlane.comcccairway-assessment
4. American Society of Anesthesiologists Task Force on Management of the Difficult Airway. Practice guidelines for management of the difficult airway: an updated report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. Anesthesiology. 2003 May; 98(5):1269-77. Erratum in: Anesthesiology. 2004 Aug; 101(2):565. PubMed PMID: 12717151.
5. Sunanda Gupta et al. Airway assessment: predictors of difficult airway. Indian Journal of Anesthesia 2005; 49 (4) : 257 - 262
6. Benumof JL. Definition and incidence of difficult airway. In: Benumof JL. Editor. Airway management: Principles and practice. St Louis Mosby 1996: 121-125 (Ch 6).
7. Law JA, Broemling N, Cooper RM, Drolet P, Duggan LV, Griesdale DE, et al. The difficult airway with recommendations for management - Part 2 - The anticipated difficult airway. Can J Anaesth. 2013 Nov; 60(11):1119-38.
8. Mallampati SR, Gatt SP, Gugino LD, Waraksa B, Freiburger D, Liu PL. A Clinical sign to predict difficult intubation; a prospective study. Can Anaesth Soc J 1985; 32: 429-434.
9. Banister FB, Mc Beth RG. Direct laryngoscopy and tracheal intubation. Lancet 1964; 2: 651.
10. Bellhouse CP, Dove C. Criteria for estimating likelihood of difficulty of endotracheal intubation with the Macintosh laryngoscope. Anaesth intensive care 1988; 16: 329.
11. Patil VU, Stehling LC, Zauder HL. Predicting the difficulty of intubation utilizing an intubation guide. Anaesthesiology, 1983; 10: 32.
12. Savva D. Prediction of difficult tracheal intubation. Br J Anaesth 1994; 73: 149-153.
13. Chou HC, Wu TL. Mandibulohyoid distance in difficult laryngoscopy. Br J Anaesth 1993; 71: 335-9.

14. Murphy MF, Walls RM. The difficult and failed airway. In: Manual of emergency airway management. Chicago: Lipincott. Williams and Wilkins 2000: 31-9.
15. Reed MJ, Dunn MJG, McKeown DW. Can an airway assessment score predict difficulty at intubation in the emergency department? Emerg Med J 2005; 22: 99-102.
16. Cormack RS, Lehane J. Difficult tracheal intubation in obstetrics. Anaesthesia 1984; 39: 1105-1111.

How to cite this article: Tungaria H, Dindor BK, Raiger LK et al. Anticipated difficult airway in posterior neck swellings: a report of two cases and literature review. Int J Health Sci Res. 2016; 6(3):308-315.

****