

BULP: Conventional Difficult Airway Instruments Using Unconventional Manoeuvre in Patient with Rheumatoid Arthritis

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Abstract

Rheumatoid Arthritis is a chronic systemic disease affecting various systems. For the anaesthesiologist, out of all the organ system involved, the airway involvement presents a unique challenge. In such cases of anticipated difficult airway, all the conventional instruments in the difficult airway armamentarium must be employed. In the case we present, the instruments available to us failed to provide a sufficient glottic view required for tracheal intubation. An unconventional manoeuvre of Backward Upward Leftward Pressure (BULP) was attempted which resulted in a well centralized view of the lateralised vocal cords.

Keywords: Rheumatoid Arthritis, Difficult Airway, Airtraq, Truview laryngoscope, BULP

Introduction

Rheumatoid arthritis (RA) affects 1-2% of population. It is a chronic systemic inflammatory disorder with symmetric polyarthritis. A thorough pre-operative assessment including history and physical examination is essential to assess the extent and severity of disease. Airway assessment is crucial to anticipate difficult airway. Thus while encountering difficult airway, different modalities and means of securing the airway should be considered liberally and the most suitable technique with the given situation should be employed.

Case Report

A 40-year-old male, diagnosed with carcinoma of lower esophagus was posted for feeding jejunostomy. He was diagnosed with RA since 20 years. He typically manifested with stiffness of joints specially bilateral wrist and interphalangeal joints. His general condition was moderate, poorly nourished and he had a stooping posture. Airway examination revealed mouth opening of 3.5 cm, Mallampatti classification II, Mentohyoid distance 3 cm, Thyromental distance 4.5 cm, Thyrosternal distance 6 cm, Mentosternal distance 11 cm, neck circumference 35 cm. Neck extension was restricted which made the case of an anticipated difficult airway.

Pre-operative routine investigations were within normal limits. Patient was preoxygenated with 100% oxygen for 3 minutes, Inj Fentanyl 1 ug/kg i.v given and induced with Inj Propofol 2mg/kg i.v. After confirming adequate mask ventilation Inj Succinylcholine 1.5 mg/kg i.v injected and after 60 seconds laryngoscopy with Macintosh blade 3 followed by McCoy Blade 3 attempted but no vocal cord structures were visualized. Laryngoscopy with McCoy blade 4 was attempted, yet no structures appreciated. Since the mouth opening was adequate Airtraq was introduced with minimal neck extension

but nothing could be visualized and there was fogging of the lens.

Finally Truview was introduced and various external laryngeal maneuvers tried like BURP (Backwards Upwards Rightward Pressure) yet no vocal cords visualised. Then with Backward, Upward and Leftward pressure applied, the anterior most part of aryepiglottic folds was visualized. The glottic view was found to be Cormack Lehane grade IV. Bougie guided intubation with 7 number cuffed endotracheal tube done.

Intraoperatively no significant events were recorded. Patient was maintained on O₂:N₂O 40:60 and intermittent propofol boluses with atracurium. Post-operatively, after adequate regaining of reflexes like cough, swallowing, and good muscle tone and power, the endotracheal tube was exchanged with a Ventilating bougie (Frova) and patient observed for 30 minutes after which he was extubated.

Discussion

Rheumatoid arthritis (RA) is an autoimmune disorder of unknown etiology characterized by symmetric, erosive synovitis and, in some cases, extraarticular involvement. Most patients experience a chronic fluctuating course of disease that, despite therapy, may result in progressive joint destruction, deformity, disability, and even premature death [1]. Patients suffering from RA presenting for surgery poses a myriad of challenges to the anaesthesiologist. A thorough history of the RA including severity and duration of the disease, drug treatments and systemic complications should be taken, and meticulous assessment of the airway should be performed. The airway is considered difficult in RA due to the involvement of the atlantoaxial (AA), temporomandibular (TMJ) and the cricoarytenoid joints. The atlanto-axial joint is commonly affected in RA because of attenuation of the transverse ligament and erosion of the odontoid peg. This can lead to atlanto-axial instability in about 25% of patients suffering from RA [2]. Cricoarytenoid dysfunction is another factor influencing difficulties related to airway management. The larynx may be affected in approximately 80% of patients. The symptoms may be presented as foreign body sensation in the oropharynx, dysphagia, dyspnea, hoarseness, stridor, and also by

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airway obstruction [3]. Pre-existing glottic stenosis due to bilateral ankylosis of the cricoarytenoid joints may be asymptomatic pre-operatively, but with the additional oedema caused by tracheal intubation, complete airway obstruction may occur following extubation [4].

Thus airway assessment is a vital component of the pre anaesthetic work up of RA patients. The range of neck flexion and extension, TMJ mobility and mouth opening must be assessed. Preoperative neurological deficits should be documented. The Mallampati score and mandibular protrusion have a high positive predictive value, but may miss up to half the difficult cases. Plain flexion and extension lateral radiographs, looking for C1/C2 joint space loss, better predicts difficult laryngoscopy in these cases [5]. Where intubation is anticipated to be difficult because of cervical spine instability, TMJ disease or a reduction in neck movement, an awake fiberoptic intubation and positioning of the C-spine is highly recommended [6].

However due to the unavailability of fibre optic laryngoscopes at our institute and as mask ventilation was successful we chose to proceed with conventional laryngoscopy with Macintosh blade 3. After Macintosh and the McCoy laryngoscopes failed to visualize the larynx, Airtraq was introduced. Since vocal cords were lateralized, they couldn't be visualized with Airtraq and the fogging of lens gave a blurred view which was a deterrent for intubation. Failure to intubate using video laryngoscopes despite a good glottic view is known. Channelled video-laryngoscopes perform better in these cases and extension of channel to tip of scope further improves success rate. Channel doesn't extend to the tip in Airtraq and this can cause

difficulty [7]. Also the Airtraq only gives a view of the midline plane which makes visualisation of cords lateralised to either side of the midline due to RA, impossible.

In contrast, the Truview EVO₂(C) laryngoscope applies the optical principle of light refraction to provide a good view of an anteriorly placed larynx. It provides unmagnified anterior refraction of 42 degrees in the line of sight with minimal manipulation of the head, neck, instrument or soft tissues [8]. It has a straight blade with a curved tip which provides clearer wider angle views than direct vision and the Oxygen port provides a fog-free image.

Knill described the BURP maneuver in 1993 which consists in the backward, upward and rightward pressure of larynx. The maneuver improves the visualization of the larynx structures and eases intubation [9]. In our case, cricoarytenoid joint involvement due to RA lead to lateralization of cords to the right side which made their visualisation with the usual external laryngeal maneuver of Backward Upward Rightward pressure (BURP) difficult. But an extreme Backward Upward Leftward pressure (BULP) caused centralisation of the affected cords, which facilitated intubation with the help of Ventilating bougie (Frova).

Conclusion

Thus we present a case of Rheumatoid Arthritis with an undiagnosed involvement of the cricoarytenoid joint in whom the conventional Truview EVO₂ laryngoscope and an unconventional BULP manoeuvre made a difficult intubation possible.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the Journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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