

## TMJ Ankylosis – Airway Management, Anaesthesiologist Dilemma: Awake Or Anesthetized?

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### Abstract:

**Introduction:** Temporo-mandibular (T-M) joint ankylosis presents a challenge to the anaesthesiologist as airway management may be quite tricky and difficult. Intubation by awake fibre-optic laryngoscopy (FOL), though favoured by many, presents difficulties of its own as the patient may be coughing, bucking &/or struggling throughout the procedure besides eliciting hemodynamic responses which may be undesirable in some patients. An anesthetized patient, in such a situation, may be quite easy to handle.

**Study Aims:** To determine the ease of intubation in cases of T-M joint ankylosis in anesthetized patients.

**Patients & Methods:** 10 ASA I & II patients, aged between 10 & 60 years, undergoing maxillo-facial surgery for TMJ Ankylosis. Preoperative evaluation did not reveal any airway abnormality other than the process for which the patients were being operated. Premedication with Midazolam (0.03 mg/kg) & Glycopyrrolate (0.004 mg/kg) was used in all the cases. Patients were anesthetized with Propofol (1.5 - 2.5 mg/kg) & after confirmation of ability to ventilate the patient, each patient received Succinylcholine (0.6 mg/kg). Fiberoptic (FOL) laryngoscopy was then tried. All the patients were monitored for hemodynamic variables, SpO<sub>2</sub> & ECG abnormalities.

**Results:** FOL assisted intubation was successful in all the patients with a mean time of 63 seconds. Hemodynamic variables before & after intubation were comparable. No patient showed desaturation (SpO<sub>2</sub> < 93 %) or any ECG abnormality.

**Conclusions:** A careful preoperative evaluation & assessment can help in successful airway management under anaesthesia with FOL.

**KeyWords:** Temporo-mandibular joint (TMJ) Ankylosis, Fibre-optic Laryngoscopy (FOL), Airway Management, Anesthetized.

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Date of Submission: 29-11-2017

Date of acceptance: 09-12-2017

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### I. Introduction

Temporo-mandibular joint (TMJ) ankylosis presents a challenge to the anaesthesiologist as airway management may be quite tricky & difficult. Causes of TMJ ankylosis may be congenital, trauma, infection, idiopathic & less frequently, rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, fibrodysplasia ossificans, etc<sup>1</sup>. Blind nasal intubation & flexible fibre-optic laryngoscope (FOL) assisted intubation are the two options employed most commonly for securing the airway<sup>2</sup>. However, the dilemma is always whether to intubate awake or under anaesthesia. Though an awake intubation is recommended by many, intubation under anaesthesia offers advantages of its own<sup>3</sup>. The problem becomes even graver in the paediatric age group with their small mouth opening & near total trismus. Moreover, the uncooperativeness on the part of the child may render securing of the airway impossible in the awake state<sup>4</sup>. Coughing, bucking & struggling on the part of the patient add to the difficulties of the anaesthesiologist. Moreover, the hemodynamic responses elicited during the procedure may be undesirable in some patients. An anesthetized patient, on the other hand, may present an entirely different scenario – with the patient being quite still & the anaesthesiologist's view also remaining unhindered, especially with the use of prior anti-sialagogues. Undesirable hemodynamic responses too, may not be elicited.

### Study Aim

To determine the ease of intubation in cases of Temporo-mandibular Joint Ankylosis in anesthetized patients.

### II. Patients & Methods

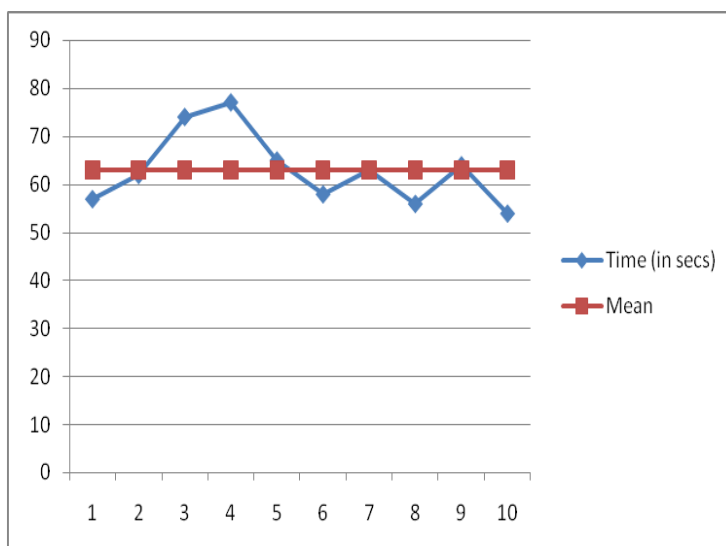
The study was conducted in the Department of Anaesthesiology & Intensive Care, MMIMSR, Mullana, Ambala after approval from the Institutional Ethics Committee. 10 patients, belonging to ASA Class I or II,

aged between 10 & 60 years undergoing maxillo-facial surgery for TMJ Ankylosis, formed the study group. A thorough preoperative evaluation was done on each patient with special emphasis on airway assessment. It did not reveal any airway abnormality apart from the condition for which the patients were being operated (i.e., TMJ Ankylosis). Premedication with Midazolam (0.03 mg/kg) & Glycopyrrolate (0.004 mg/kg) was used in all the cases. After pre-oxygenation with 100 % O<sub>2</sub> for 3 – 5 mins, anaesthesia was induced with Propofol (1.5-2.5 mg/kg) and mask ventilation was tried once the patient went into apnoea. After confirming the ability to ventilate the patient with bag & mask, all the patients received Succinylcholine (0.6 mg/kg) & mask ventilation was continued. Flexible fiberoptic laryngoscope (FOL) assisted intubation was then tried. All the patients were monitored for hemodynamic variables (MAP, HR), SpO<sub>2</sub> & ECG abnormalities.

**IV. Results:**

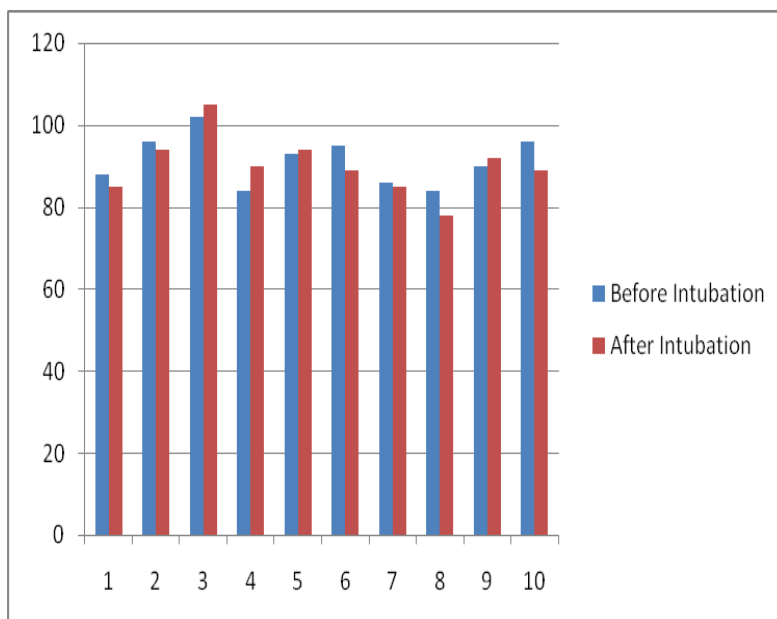
FOL assisted intubation was successful in all the patients with a mean time of 63 seconds as shown in Fig 1.

Patient No.	Time Reqd for Intubation (in secs)	Mean ± SD
1	57	63 ± 7.557
2	62	
3	74	
4	77	
5	65	
6	58	
7	63	
8	56	
9	64	
10	54	

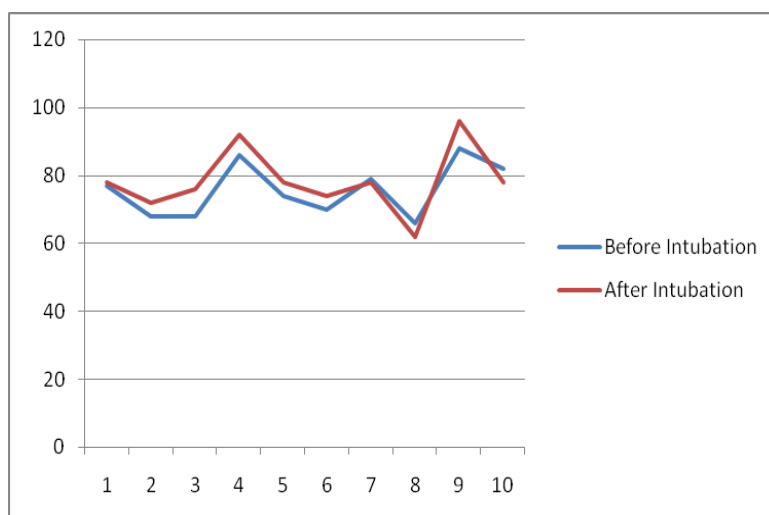


**Fig 1.** Time Required for FOL & Intubation (in seconds)

Patient No.	MAP (mmHg)		Heart Rate (bpm)	
	Before Intubation	After Intubation	Before Intubation	After Intubation
1	88	85	77	78
2	96	94	68	72
3	102	105	68	76
4	84	90	86	92
5	93	94	74	78
6	95	89	70	74
7	86	85	79	78
8	84	78	66	62
9	90	92	88	96
10	96	89	82	78
Mean ± SD	91.4 ± 6.36	90.3 ± 5.66	75.8 ± 7.87	78.4 ± 9.61



**Fig 2.** Mean Arterial Pressure (mmHg) Before & After Intubation.



**Fig 3.** Heart Rate (beats per minute) Before & After Intubation.

Patient No.	SpO2 (%)	
	Before Intubation	After Intubation
1	99	96
2	98	95
3	100	94
4	99	96
5	100	98
6	100	99
7	100	98
8	100	97
9	99	97
10	98	97
Average ± SD	99.3 ± 0.82	96.7 ± 0.85

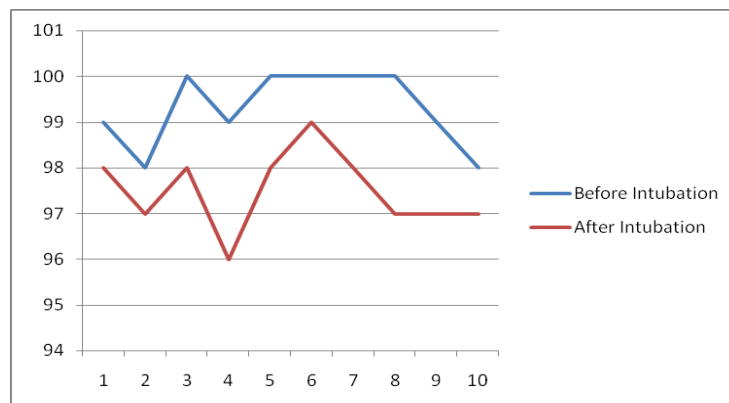


Fig 4. SpO<sub>2</sub> Measurements Before & After Intubation.

### III. Discussion

Endotracheal intubation in patients with altered airway anatomy always remains a challenge for the anaesthesiologist especially when it is associated with limited or nil mouth opening as may well be the case in TMJ ankylosis<sup>5</sup>. Temporomandibular joint is a diarthrodial synovial joint joining the mandible to the cranium with both the TM joints functioning as a single unit. Thus, even if only one joint is affected, the end result is limited mouth opening<sup>6</sup>. Among the various causes of TMJ ankylosis, inflammation & trauma are the commonest. Options for securing the airway include blind nasal intubation, fiberoptic laryngoscopy (FOL), seeing optic stylet system (SOS), flexible airway scope tool (FAST), lightwand, retrograde intubation and tracheostomy. The latter two being invasive techniques are less preferred<sup>7,8</sup>. Fiberoptic intubation is the gold standard for securing the airway in case of TMJ ankylosis. Blind nasal intubation, even in experienced hands, has a high possibility of failure, trauma & bleeding<sup>9</sup>. The problem may be compounded by uncooperativeness (especially in case of children), coughing, bucking & reflex responses if awake intubation is attempted. Propofol induction offers the advantage of avoiding light planes of anaesthesia as may occur with an inhalational technique<sup>3</sup>. Use of low dose succinylcholine presents an immobile patient for a short duration which may aid the anaesthesiologist in his attempts at securing the airway. A drying agent is recommended so that vision is not hampered by secretions during FOL<sup>6</sup>.

In our study, fiberoptic laryngoscope assisted intubation was quite easy under anaesthesia with a still & clear field of vision & minimal hemodynamic responses, probably due to the stability afforded by Propofol.

### IV. Conclusion

A careful preoperative evaluation & assessment can help in successful airway management under anaesthesia with fiberoptic laryngoscopy (FOL). However, larger studies need to be undertaken before any recommendation can be given.

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