

Anesthetic Considerations In Oral And Maxillofacial Surgeries

R.Kanthimathi Kailasam¹, P.Venkatalakshmi Aparna², S.Leenasankari³, A.Praszanth⁴, N.Narmatha⁵

¹Associate Professor, Tamilnadu Multi Superspeciality Hospital, Chennai.

²Professor, Department Of Oral Medicine And Radiology, Ragas Dental College And Hospital, Chennai.

³Professor, Oral Pathology & Microbiology, Sree Balaji Dental College & Hospital, Bharath Institute Of Higher Education And Research, Chennai.

⁴Senior Lecturer, Oral & Maxillofacial Surgery, Priyadharshini Dental College & Hospital, Chennai.

⁵Senior Lecturer, Department Of Oral Medicine & Radiology, Ragas Dental College & Hospital, Chennai.

Abstract: Oral And Maxillofacial Surgeries Are Carried Out For Maxillofacial Trauma, Infections, Developmental Disturbances In Head And Neck Region And Malignancy. Anaesthetic Considerations Vary Among Paediatric And Geriatric Population And Also Based On The Aetiology For Oral And Maxillofacial Surgeries. According To American Society Of Anaesthesiologists (Asa) Recommendations, Pre Anaesthetist's Visit Should Have An Interview With Patient Regarding Their Past Medical History, Anaesthetic Exposure, Drug History And Assignment Of Asa Physical Status Score.

1. INTRODUCTION:

Anaesthetic Considerations For Oral And Maxillofacial Surgeries Are Discussed Under The Following Categories For

- Paediatric Patients
- Adult Patients
 - Co Operative
 - Un Co-Operative Patients
 - Special Needs
- Maxillofacial Surgeries:
 - Infections
 - Maxillofacial Trauma
 - Malignancy

Paediatric Considerations:

“A Paediatric Anaesthesia Patient Is Defined As 18 Years Of Age Or Younger”. Although Anaesthetists Are Astutely Familiar And Talented In Providing Anaesthesia For Adults, It Would Not Be Prudent To Hold The Same Confidence Against The Paediatrics. The Geometry Of Paediatrics Varies Extremely And There Are Varied Considerations In Administering Anaesthetic Procedure[1, 2] Anatomical Considerations Such As Long Floppy Epiglottis, Position Of The Larynx At The Level Of C4, Funnel Shaped Airway, Narrow Subglottic Area Transversely Are To Be Considered While Treating Paediatric

Patients. In Case Of Treating Patients With Special Needs Like Adhd, Autism, Care Should Be Considered In Administrating Anaesthesia To Prevent Any Interactions With Platelets Aggregation From The Non-Stimulant Serotonin Reuptake Inhibitors.[3]

Asa Recommends Specialized Pediatric Equipment Such As Airway Equipment For All Ages Of Paediatric Patients Including Ventilation Masks, Laryngeal Mask Airways, Endotracheal Tubes, Oral And Nasopharyngeal Airways, And Laryngoscopes With Paediatric Blades.[4]

Co-Operative Child:

Preoxygenation For Several Minutes Before Induction Is Ideal. Sevoflurane Can Be Used As A Single Inhalational Agent Or In Conjunction With Nitrous Oxide. [2]

Uncooperative Children:

A Single Breath Technique Is Effective. The Circuit Is Primed With 8% Sevoflurane. Preoxygenation Is Often Not Practical In A Crying Child. The Mask Is Placed With Some Force, Often While The Child Is Seated In The Parent's Lap. Crying Promotes Quick Inhalation Of The Anaesthesia For The Paediatric Patient. When The Patient Is An Uncooperative Child, Flexible Fiberoptic Intubation Is To Be Done Under Ga. Fiberoptic Intubation Of The Spontaneously Breathing Patient Is The Gold Standard And Technique Of Choice For The Elective Management Of A Difficult Airway. [1,2]

Impact Of Force:

Nasal Bones And Zygoma Require Low Impact Force For Damage Whereas Supraorbital Rim, Maxilla, Mandible And Frontal Bone Require High Impact Force For Damage. A Key Tenet Of The Curriculum That Remains The Same Is The Abcde (Airway, Breathing, Circulation, Disability, Exposure) Algorithmic Approach To The Rapid Initial Evaluation Of The Injured Patient.

Maxillofacial Bleeding:

Though Not Considered As The Mainstay For Emergency Management Until Life Threatening Haemorrhage Persists. Situation Is Treated By Blood Substitutes, Packing, Ligation And Arterial Embolization As The Mainstay Of Treatment. [5] Mild Bleeding Cases Are Treated With Videolaryngoscopic Guided Orotracheal Intubation. In Case Of Moderate To Severe Bleeding ,Optical / Lighted Stylet Guided Naso Tracheal Intubation.

Topical Vasoconstrictor Such As 4% Cocaine And 0.025% To 0.050% Oxymetazoline Hydrochloride Lessen The Risk Of Epistaxis And Complications Of The Intubation Process. The Combination Of 4% Lidocaine And 1% Phenylephrine Has Been Shown To Be Effective And Reliable And Safer Than Topical Cocaine [6]

Maxillary Fractures: [7]

Lefort Fractures First Described By Anatomist Rene Le Fort In 1901

1. Le Fort I (Transverse Fracture) :

It Is Separated Maxillary Alveolus At The Lower Margin Of Pyriform Aperture And Extended Through Maxillary Sinus.

2. Le Fort II (Pyramidal Fracture):Extended From Le Fort I Through Infra Orbital Rim And Cross The Bridge Of Nose Either High Or Low Fashion.

3. Le Fort Iu (Craniofacial Disjunction): The Fracture Line Extended Across The Floor Of The Orbit And Up Through Nasofrontal Area Separated The Frontal Bone From Zygoma And Orbit.

Airway Injuries:

A Quick Assessment Of Airway Is Done By Lemon Assessment. It Consists Of Look Externally To Detect Difficult Airway Predictors, Such As Short Neck, Evaluate Mouth Opening And Thyromental Distance, Mallampati Class, Obstruction Of The Upper Airway And Neck Mobility. Airway Obstruction Directly Related To Maxillofacial Trauma Can Be Caused By Tongue Base Or Maxillary Prolapse, Pharyngeal Edema Or Hematoma, And Severe Haemorrhage. Patients With Bilateral Mandibular Body Fractures Are At Risk For Tongue Base Prolapse; Tongue Retraction With A Heavy Suture Or Towel Clamp Will Allow Oxygenation Until A Definitive Airway Is Secured. Le Fort Fractures May Cause Airway Compromise Via Maxillary Prolapse, Edema, Or Haemorrhage [8]

Airway Maintenance Is The First Step In The American College Of Surgeons Advanced Trauma Life Support Protocol. The Majority Of Patients With Maxillofacial Trauma Present With A Stable Airway, And Simple Monitoring Of Oxygenation Via Pulse Oximeter Is Required. With Regards To Cognitive Impairment, Advanced Trauma Life Support Protocol Recommends Intubation Of All Patients With A Glasgow Coma Scale Score Of 8 Or Less.

Flexible Fiberoptic Intubation Under Local Anaesthesia With Sedation Is The Technique Of Choice For Management Of The Anticipated Difficult Airway With Restricted Mouth Opening And Difficult Mask Ventilation In The Patient Undergoing An Elective Procedure[9] Ovassapian Et Al Suggested That Blind Nasal Intubation Is A Simple Technique And Excellent Alternative In The Absence Of Fiberscope But It Has Two Major Drawbacks: Infrequent Success On The First Pass And Increased Trauma With Repeated Attempts, Precipitating Complete Airway Obstruction That Necessitates Emergent Cricothyrotomy. Tracheostomy Under Local Anaesthesia Had Been Considered Gold Standard Of Difficult Airway Management And For Postoperative Period. 5% Risk Of Complications, Such As Haemorrhage Or Pneumothorax. Modified Mallampati Score Is A Good Predictor Of Difficult Direct Laryngoscopy And Intubation, But Poor At Predicting Difficult Bag Mask Ventilation

Modified Mallampati Scoring:

- Class I: Soft Palate, Uvula, Fauces, Pillars Visible.
- Class Ii: Soft Palate, Major Part Of Uvula, Fauces Visible.
- Class Iii: Soft Palate, Base Of Uvula Visible.
- Class Iv: Only Hard Palate Visible.

General Approach:

Orotracheal Intubation Is Indicated For Procedures Involving The Middle Third Of The Face And The Nasal Cavity. Nasotracheal Intubation Is Needed For Cases Involving The Lower Third Of The Face Or Oral Cavity Or Procedures Requiring Intermaxillary Fixation. A Majority Of Omf Procedures Are Managed With Nasotracheal Intubation With A Cuffed Nasal Rae, The Ett Of Choice. [10]

If The Patient Has A Known Difficult Airway Or The “Awake Look” Is Equivocal, An Awake Intubation Probably Should Be Performed. This Is Frequently Accomplished With A Flexible Fiberoptic Intubating Endoscope After Topical Application Of Local Anaesthetics

To The Upper Airway And Small Incremental Doses Of Intravenous Sedation. For Patients Who Are Expected To Have Significant Postoperative Soft Tissue Swelling Or Alterations In Their Airway Anatomy, Or Who May Require Additional Surgical Procedures, An Elective Tracheotomy Should Be Considered. If The ETT Cuff Is Ruptured By The Magill Forceps During Intubation, By A Sharp Turbinate Bone, Or Accidentally By The Surgeon, The Hypopharynx Should Be Packed To Allow Effective Ventilation Of The Patient Until The ETT Can Be Replaced. [11,12,13]

Patients With Associated Injuries:

No Consensus Regarding The Best Means Of Intubation In Patients With Cervical Spine Injuries Has Been Reached. Reports Of Rapid Sequence Induction, Manual Inline Stabilization Of The Head, And Orotracheal Intubation Via Direct Laryngoscopy Have Shown To Be A Successful Manoeuvre. To Attempt Intubation Via Manual Inline Stabilization, The Patient's Head Is Placed In A Neutral Position And Grasped At The Mastoid Processes By An Assistant. This Serves To Limit The Natural Head Movement That Occurs During Direct Laryngoscopy. Other Intubation Tools That Limit Cervical Motion Include The Bullard Laryngoscope And The Flexible Fiberoptic Endoscope. [12,13]

Maxillofacial Surgeries:

Comminuted Parasymphysal Mandibular Fractures:

Tongue Fall Back Posteriorly Due To Anterior Attachment Loss Leading To Airway Obstruction. It Can Be Reduced By Upright Positioning But Spinal Injury Can Be Worsened If Present. [14]

Upper Face And Lower Face Involvement:

Upper Midface Are Managed With Oral Intubation While Lower Midface Are Managed With Nasal Intubation

Head Trauma

Elderly Patients Suffering Ground-Level Falls Are An Increasing Trauma Patient Demographic. Many Of These Patients Are Treated With Anticoagulation, And The Use Of These Medications Should Be Relayed To Consulting Neurosurgeon. Direct Visualization With A Flexible Or Rigid Fiberoptic Endoscope Is Generally The Best Approach. Experience With The Use Of Topical Local Anaesthetics And Nerve Blocks Of The Airway, Along With Cautious Use Of Sedation And Anxiolytics, Simplifies Airway Management In These Patients. The Route Of Intubation (Oral Or Nasal) Must Be Considered Relative To The Factors Listed Above. Nasotracheal Intubation Is Contraindicated In Patients With Cribriform Plates Or Skull Base Fracture. Arrow Smith Et Al Stated In Their Study That Basal Skull Fracture Should Not Be Regarded As An Absolute Contraindication To Nasotracheal Intubation. It Is Absolutely Safe To Do Nasotracheal Intubation Under Vision By Fiberoptic Bronchoscope In Basal Skull.[12] Alternative Airway Management Devices Such As Laryngeal Mask Airway And The Tracheoesophagealcombi Tube, Have Gained Recent Popularity.

Infections:

Infections Of The OMF Region Present Many Challenges To The Anaesthesia Provider, Particularly Regarding Induction Of Anaesthesia And Airway Management. Anaesthetic Management Of Patients Presenting With OMF-Related Infections Must Consider The Degree

Of Airway Patency, Respiratory-Related Complaints And Symptoms, Presenting Mental Status, Aetiology, Anatomic Location And Time Course Of The Infectious Process, And Additional Comorbidities. These Patients May Need To Remain In An Upright Position To Maintain Patency Of Their Airway. [13]

The Use Of Blind Intubation Techniques, Either Orally Or Nasally, Is Probably Best Avoided To Limit The Risk Of Soft Tissue Trauma And Bleeding. Fiberoptic Intubation Techniques Are Best Reserved As A First-Line Approach Rather Than When Other Standard Approaches Have Failed, As Subsequent Bleeding Or Tissue Trauma May Lessen The Opportunity For Success. In Situations Of Extremis, Or Patients Presenting With Significant Anatomic Changes Safely Limiting Access To The Airway By Conventional Techniques, Or When The Surgical Procedure May Yield Limited Postoperative Access To The Airway, An Awake Tracheotomy Or If Necessary A Percutaneous Cricothyrotomy Followed By A Formal Tracheotomy Should Be Considered.[15]

Patients With Oral And Maxillofacial Malignancy:

Patients With Oral And Maxillofacial Malignancy Are Handled By The Same Procedure Followed For OMF Infections.[16]Performing A Tracheotomy Intraoperatively May Be The Best Approach Following A Significant Resection And Reconstruction, Or When Further Procedures Are Anticipated. Concise Anaesthetic Consideration's For Various Scenario Are Discussed In Table 1 And 2.

Table 1: Anesthetic Consideration Based On Mouth Opening

S.No	Mouth Opening Status	Method
1.	Adequate Mouth Opening	Direct Laryngoscopy
2.	Mouth Opening > 2cm	Videolaryngoscopicguided Orotracheal Intubation
3.	Severe Mechanical Restriction To Mouth Opening	Blind Naso Tracheal Intubation

Table 2: Anaesthetic Consideration Based On The Difficulty In Airway

S.No	Airway Status	Anesthetic Techniques
1	No Anticipated Difficulty	Direct Laryngoscopy With Manual In-Line Stabilisation
2	Difficulty In Mask Ventilation	Modified Rapid Sequence Induction
3	Anticipated Difficult Airway, No Active Bleeding	Awake Fiberoptic Intubation
4	Gross Distortion Of Airway, Anterior Neck Airway	Tracheostomy
5	Contraindicated Nasal Intubation	Retro Molar Intubation Submental Intubation

2. CONCLUSION:

Oral And Maxillofacial Surgeries Are Commonly Performed For Maxillofacial Trauma Due To Increase In Trauma Incidence. Major Catastrophic Sequelae Such As Death Or Permanent Injury Following General Anaesthesia Are Thankfully Rare. This Is Mostly Because Of Thorough Knowledge And Anticipation Of Different Situations Arising During

Anaesthetic Management. Thus Anaesthetists Play An Important Role In Management Along With General Physician, Oral And Maxillofacial Surgeon.

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