



## **Incidence of Difficult Intubation in Tmj Ankylosis Patients in University Setting**

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### **Authors' contributions**

*This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.*

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## **ABSTRACT**

**Introduction:** A fusion of the mandibular condyle with the base of the skull causes ankylosis of the temporomandibular joint (TMJ), which results in a lack of joint movement. The anesthesiologist is concerned about prolonged temporomandibular joint ankylosis because of the restricted airway, which makes intubation difficult. Despite the fact that TMJ ankylosis is a well-known risk factor for difficult airway management, the strategies used are based on the anesthesiologists' skill. It's never easy intubating a patient with temporomandibular joint ankylosis. The purpose of this study was to see how common problematic intubation was in TMJ ankylosis patients.

**Aim of the Study:** The aim of the present study was to evaluate the incidence of difficult intubation in TMJ ankylosis patients.

**Materials and Methods:** Among the overall data of patients attending Saveetha Dental College, a retrospective analysis of all the cases (patients who underwent TMJ ankylosis surgery) was extracted. Excel spreadsheets were used to enter the data. SPSS software version 19 was used to analyse the data collected. The data were statistically evaluated using the Chi square test.

**Results:** In this study, it was discovered that the incidence of difficult intubation in TMJ ankylosis surgery was higher in the age group of 5-18 years than in the other age groups. Intubation in children is tough. The chi square test resulted in statistically significant findings ( $p < 0.005$ ).

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**Conclusion:** Nasal intubation and fiberoptic intubation were the most common modes of intubation used in TMJ ankylosis surgery, according to the results of this small sample retrospective analysis. The difficulty of intubation was increased in the paediatric age group (5-18 years).

*Keywords:* Difficult intubation; fiberoptic intubation; tracheostomy; nasal intubation; innovative technique.

## 1. INTRODUCTION

Ankylosis of the temporomandibular joint (TMJ) causes a partial or complete inability to open the mouth. TMJ ankylosis is still very common in India. It can be seen in children as young as 2 years old and as old as 60 years old [1]. TMJ ankylosis is caused by trauma or infection. The resulting sequelae include facial asymmetry, malocclusion, anaemia, and starvation. Increased airway blockage is also a result [2]. Airway blockage is caused by structural encroachment on the oropharyngeal and hypopharyngeal lumens, low intrapharyngeal pressure, and oropharyngeal muscle hypotonicity. All of these anatomical abnormalities make ventilation, intubation, and extubation problematic [3]. Surgical treatment is always used. The operations performed include condylectomy, gap arthroplasty, interposition arthroplasty, and artificial joint replacement [4]. In order to avoid complications associated with oral intubation, nasal intubation is generally used during maxillofacial surgery to ensure airway patency [4,5]. In such individuals, a deformed airway is common, and airway control is usually maintained through scheduled awake fiberoptic intubation [6]. Although awake fiberoptic intubation is the procedure of choice in complicated airway procedures, it requires expertise and experience to be deemed the safest method [7,8]. Another option for maintaining airway patency is a tracheostomy [9]. On the other hand, tracheotomy creates a scar [9] Because tracheostomy is an intrusive technique with a high rate of post-operative morbidity, it was only used in emergency situations [10,11]. Because the inability to open the mouth makes direct vocal cord vision difficult, surgery for temporomandibular joint (TMJ) ankylosis is classified as difficult intubation [12]. Severe trismus, mandibular hypoplasia with asymmetrical growth of two parts of the jaw, and restricted mandibular space with pseudo macroglossia in a confined space narrow the pharyngeal channel in TMJ ankylosis patients [13]. In order to identify the prevalence of difficult intubation in TMJ ankylosis patients, the incidence of difficult intubation is assessed.

Our team has vast research and knowledge, which has resulted in high-quality publications [14-33].

## 2. MATERIALS AND METHODS

The present study is a retrospective study carried out in a hospital setting under a specific population predominantly South Indian population. It is a single centred study with a small sample size. It was carried out under Institutional Review Board approval. In this study, data of the patients were collected by complete analysis of the data of patients between June 2020 to June 2021 from a patient management software (DIAS). Data including patients name, age, gender, surgical procedure in patients with TMJ ankylosis who underwent surgery were collected. And for further analysis the collected data was cross verified by another examiner. The collected data was tabulated using Excel Spreadsheets and the data was analysed using SPSS software version 19. The statistical study used in the study was Chi square test with p value less than 0.005 and confidence interval of 95%.

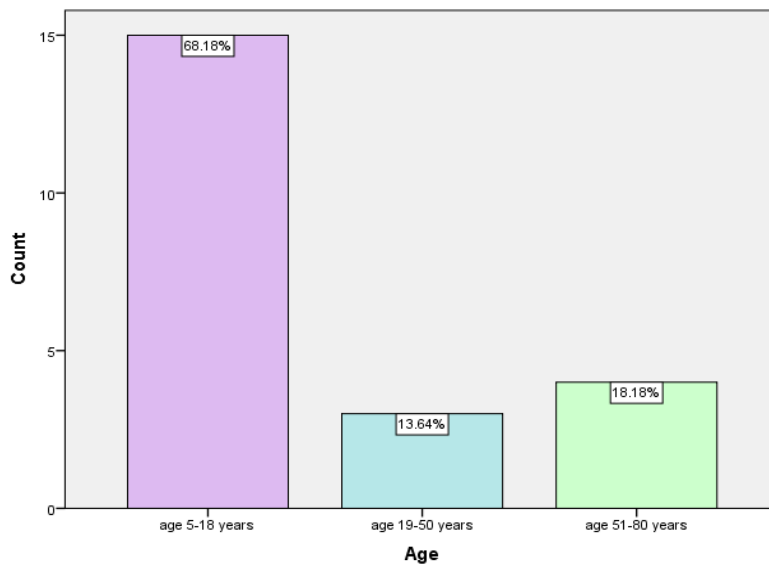
## 3. RESULTS AND DISCUSSION

In this study, it was discovered that (58.33 percent) of the male population and (41.67 percent) of the female population participated. The age groupings of 5-18 years were found to be (68.18 percent), 19-50 years were found to be (13.64 percent), and 51-80 years were found to be (13.64 percent) (18.18 percent). In the investigation of the incidence of difficulty in intubation during TMJ ankylosis surgery, nasal intubation was found to be (33.33 percent), tracheostomy was found to be (25 percent), and fiberoptic intubation was found to be (41.67 percent) among the patient population.

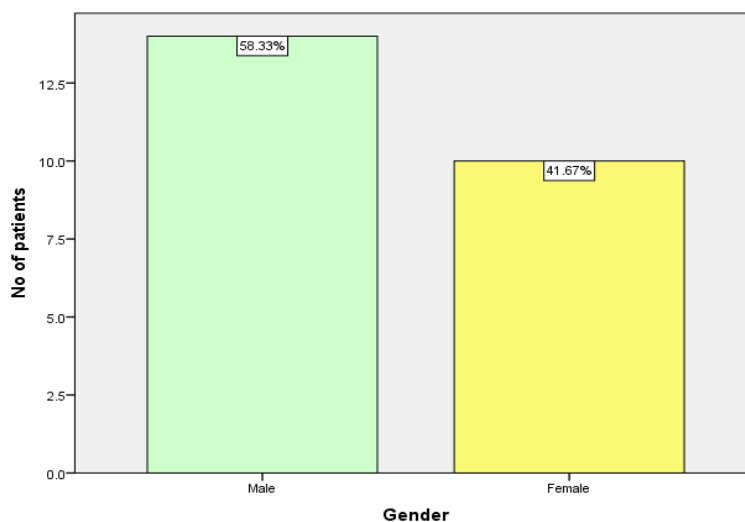
Intubation is difficult in children. Because of their restricted mouth opening and limited lower jaw protrusion, children with TMJ ankylosis are likely to have difficulty intubating. Mask ventilation is also challenging due to mandibular hypoplasia and asymmetrical growth of the two parts of the

jaw. TMJ ankylosis in children in impoverished nations manifests later in life with a substantially limited mouth opening. The traditional approach of intubation with direct laryngoscopy is usually not possible by this time. The literature mentions several airway management techniques such as tracheostomy, blind nasal intubation, and fiberoptic intubation. To reduce the risk of injury to the patient, the anesthesiologist should

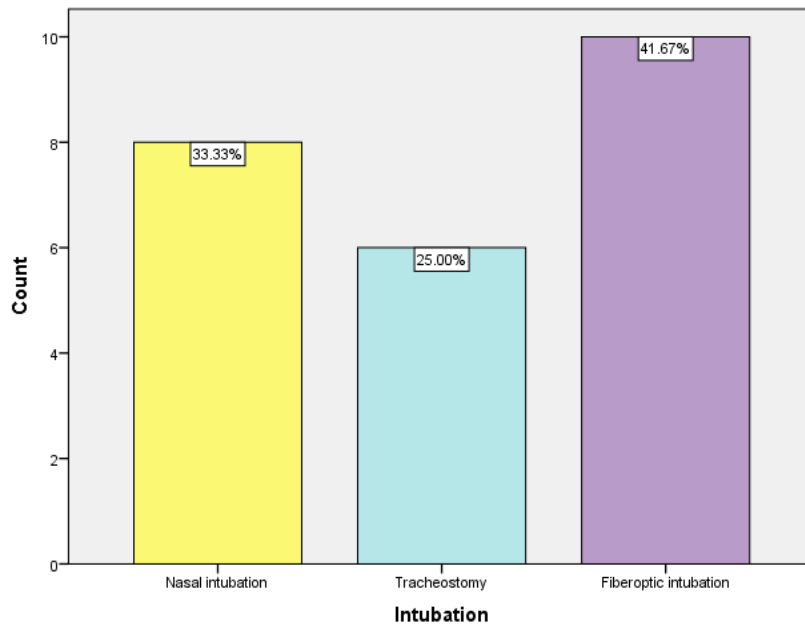
carefully assess the patient's airway, identify any potential difficulties, develop a plan with the lowest risk of injury, and have a backup plan ready. However, based on the experience and facilities available, each anesthesiology department should develop standards or algorithms that are unique to their institution. In this study, we have discussed our experience of difficult intubation in TMJ ankylosis patients.



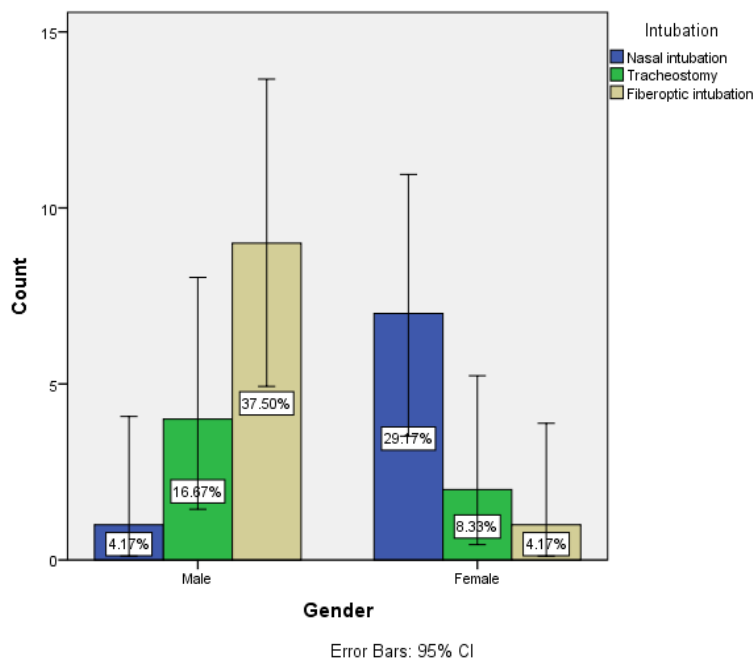
**Fig. 1. Bar chart depicting the age groups involved in the study, age groups of 5-18 years were found to be (68.18 %) , age groups of 19-50 years were found to be (13.64 %) and age groups of 51-80 years were found to be (18.18 %)**



**Fig. 2. Bar chart showing that (58.33 %) of the male population and (41.67 %) of the female population were involved in the study**



**Fig. 3. Bar chart showing incidence of difficulty in intubation of TMJ ankylosis surgery that prevalence of nasal intubation was ( 33.33 %) prevalence of tracheostomy was found to be (25%) and prevalence of fiberoptic intubation was found to be ( 41.67 %) in the study**



**Fig. 4. Bar chart depicting correlation between the gender and the incidence of difficult intubation procedures it was observed that most frequent intubation done was fiberoptic intubation (37.50 %) in male population and nasal intubation (29.17 %) in female population. The results obtained in the chi square test were statistically significant. Pearson chi square = 11.211,df=2,p=0.004**

#### 4. CONCLUSION

It can be concluded from the present small sampled retrospective study, nasal intubation and fiberoptic intubation were the most frequent difficult intubation done in TMJ ankylosis surgery. Out of which, intubation difficulty was higher in the paediatric age group 5-18 years.

#### CONSENT

It is not applicable.

#### ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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