

## Is Nasal Intubation Better than Oral Intubation in Oral and Maxilla-Facial Surgery?

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### Abstract

**Introduction:** Nasal and oral intubation have both of them their own complication but the question is about which one is the safer in oral and maxillofacial procedures.

**Materials and Method:** This is a retrospective study, which aims to compare nasal and oral intubation in oral and maxillofacial surgery.

**Results and Conclusion:** Nasal intubation caused more complications than oral intubation in our patients and data base analysis has shown that hemorrhage is the most important one. It is more suitable to respect anatomy but it is blindly underdone and some unknown abnormality of nasal anatomy increase risk of hemorrhage. Despite of that, there are some situation, which requires this route of intubation such as mouth opening restricted or surgery with maxillomandibular fixation.

**Keywords:** Nasal Intubation; Oral Intubation; Complication; Oral Surgery

### Introduction

Oral and maxillofacial surgery presents a great challenge to the surgeon as the surgical field is just around the upper away. Hence it requires special attention for the patient safety especially during surgery [1]. To provide better anaesthetic suitable for surgery success, intubation must respect anatomical operating area with minimal impediment [2]. This present study aims to compare complication caused by nasotracheal and orotracheal intubation and also to quest for the most suitable route of intubation in oral and maxillofacial surgery.

### Materials and Method

This study was performed from October 2015 till April 2017 in patients who had maxillofacial surgery under general anaesthesia with oral and nasal intubation. It was underdone in the unit of oral and maxillofacial surgery of Villeneuve Saint Georges's hospital.

Patients with normal mouth opening and patient who had maxillomandibular fixation underwent nasal intubation. The internal diameter of intubation tube was between 4 and 8 mm depending upon age, sex and size of the tube of patient. Flexo-metallic tubes were used.

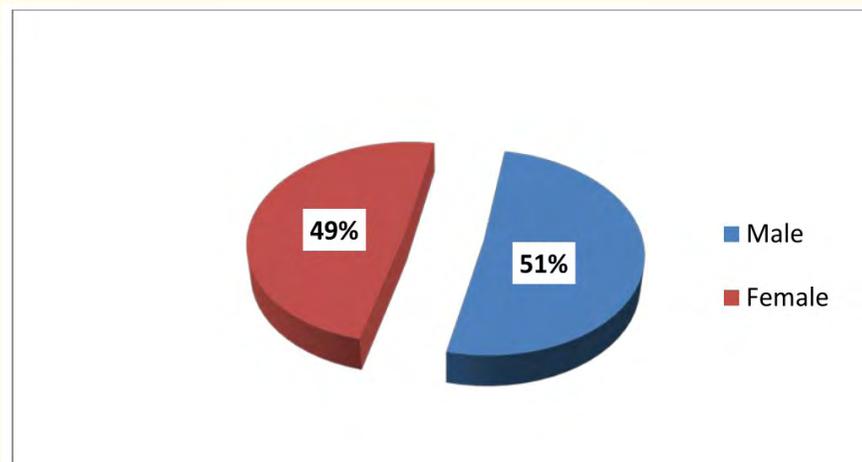
Age, sex, route of intubation, indication of surgery, and complication during surgery was assessed. The database was collected and statistical analysis was performed, using Fischer test. p-value < 0,05 was considered as statistically significant.

**Results**

We enrolled 217 patients with oral and nasal intubation. Fifty one percent was male and 49% was female (Figure 1). Any predomination of gender wasn't noticed. Patients were aged between 5 to 95 years old. Intubation was performed depending on surgical area, mouth opening before and after surgery (Table 1). Sixty three percent of our patient had oral intubation and the thirty-seven had nasal intubation.

Type of Surgical Area	Number	%
Oral Surgery with Normal Mouth Opening	136	62,67
Oral Surgery with Restricted Mouth Opening	34	15,66
Oral Surgery with MMF	40	18,43
Nasal Surgery	07	03,22
Total	217	100

**Table 1:** Repartition of route of intubation depending on area of surgery and mouth opening.



**Figure 1:** Sex of patients.

Complication of nasal (37%) vs oral intubation (63%) were noticed and compared in figure 2. It was found that nasal intubation had statistically significant influence to cause mucosal bleeding with p < 0.001 when chi square test was performed (Figure 2 and Table 2).

	Nasal intubation	Oral intubation
No complication	<	>
Hemorrhage	>	<
Teeth expulsion	<	>
Hemorrhage of uvula	>	<
Desaturation	<	>
Uvula necrosis	<	>

Table 2: Fischer test result.

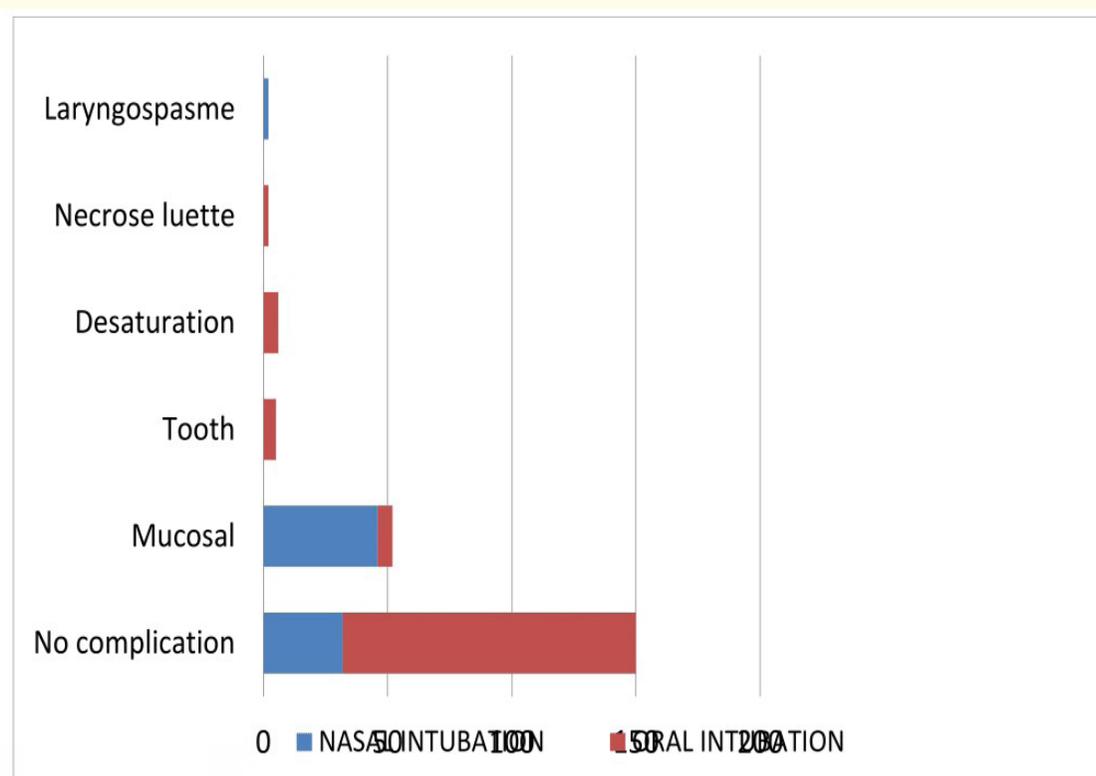


Figure 2: Repartition of complication.

### Discussion

In our study, hemorrhage was significantly high in nasal intubation. Database analysis has shown that it is statistically significant in nasal intubation than in oral intubation. The hemorrhage is statistically significant differences between both of them with respect of diameter and age of patient  $p < 0,05$ . Nasal intubation is accused to be more traumatisant because of many unknown anatomical deformation such as septal abnormality or old nasal fracture as it was found in some of our patients. Those can explain hemorrhage in nasal intubation. Even the use of suitable tube diameter already allows us to avoid mucosal traumatism such as respecting age, sex; blind nasal approach still stays traumatisant. Wide variations have been observed in the internal structures of the nasal cavity. The deviated nasal septum is the most common anatomical anomaly, affecting the anterior cartilaginous part or rarely the posterior bony part. The deviation in the nasal septum is attributed to a previous insult [1]. Many patients do not give any history of nasal trauma or a congenital anomaly. Change in the anatomy of the nasal cavity changes the airflow dynamics within the cavity, which further causes changes in mucosal lining. On the convex side of the nasal septum, there occur ulcerations, inferior turbinate hypertrophy eventually leading to an overall narrowing of the airway [1,2]. A part from that, nasal intubation requires some ability and experience of anesthetist [3].

In another side, nasotracheal approach was preferred in most of oral and maxillofacial surgery [4]. It lets a clear demarcation of surgical area and anesthetic field especially when surgery is in oral cavity but sometimes it is totally impossible because of mouth opening condition [5]. For patient with abnormal mouth opening, nasal intubation is more suitable and easier than the oral intubation one. It is the same for patients who need maxillomandibular fixation during and after surgery. This nasal intubation, offers comfort to surgeon without impediment of anesthetist area.

And there are some situation in oral and maxillofacial surgery, securing airways cannot be managed with oral intubation, which is supposed to be the standard way of securing the airway during surgical procedures because the surgeon may have to perform temporary or permanent maxillomandibular fixation or at least have an intraoperative control of the dental occlusion and has to establish the occlusion.

It has known many steps of development since 1902 and nowadays it is managed as a blind nasal intubation by considering human anatomy [6,7]. It is considered as the most suitable physiological approach to tracheal intubation [8]. In our study, a part from hemorrhage, the other complications stay in low level in nasal intubation. There are less teeth expulsion and uvula necrosis than what was found in oral intubation. Therefore, in most maxillofacial surgery especially in trauma, the airway is secured by nasotracheal intubation without interfering with the maxillomandibular fixation and surgical approach [9]. Sometimes nasal intubation is contraindicated when the facial procedure involves the nasal pyramid or there is mouth opening restricted [8,9]. In cases when oral intubation is less suitable, the method for airway control can be a tracheostomy, but it may be tiresome and may lead to many complications, such as tracheal stenosis, hemorrhage secondary to intraoperative injury of cervical vessels or infections [10]. It is, therefore, difficult to propose it to patients who need short time of intubation and who will not require prolonged airway management. Retromolar or submental intubation is another mean to approach trachea. It had been reported firstly that it as a procedure that could avoid tracheostomy. It allows for the concomitant restoration of occlusion and reduction of facial fractures in patients ineligible for nasotracheal intubation. It needs tracheal approach but in the same time it requires clear demarcation of anesthetic and surgical field [3,4,8].

In oral intubation, there are less complication but hemorrhage is still found with significantly teeth expulsion. Maxillary incisor is the more often at risk of avulsion during intubation. A part from anterior unknown trauma, teeth avulsion is due to their prominent position within the dental arch and due to their root morphology [4].

Others complications were found during our comparative study but after database analysis, they are not statistically significant.

### Conclusion

Clear demarcation of area of anesthetist and surgeon is required to efficiently work together and also facilitate better patient safety and surgical outcomes. Nasal and oral intubation is both suitable for nasal and maxillofacial surgery but there are many surgery procedures, which contraindicate oral intubation. Despite the fact that it has been statistically proven to cause more complication than oral intubation, in those cases, which require short time of intubation, nasal intubation still stays an effective and safe technique especially concerning procedure with maxillomandibular fixation, nasal surgery. Lastly, further researches are required to evaluate the effectiveness of anaesthetic and surgeon factors and more study about the others route of intubation.

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