



## Evaluation of Anaesthetic Challenges in Primary Cleft Lip and Palate Surgeries in a Single Center Study

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### Abstract

**Background:** One of the most prevalent congenital malformations and the most frequent craniofacial defects in children is cleft lip and palate. The aim of the study was to investigate the anaesthetic procedures employed and to determine the challenges and postoperative complications associated with cleft lip and palate surgery. **Material & Methods:** A retrospective review of the anaesthetic procedures carried out from January 2022 to December 2022 at the Dhaka Dental College and Hospital. The hospital records were reviewed in order to learn about every occurrence of orofacial cleft surgery. In this study, a total number of 120 cases were reviewed. **Results:** Among 120 cases, 53 (44.2%) of the patients were female and 67 (55.8%) were male. The bulk of patients came after their first year of life. About 54(45%) of them were younger than five years old. 68(56.67%) underwent cleft lip surgery, 37(30.83%) for cleft palate surgery and rest 15(12.5%) patients under went for combined cleft lip and cleft palate surgeries. Upper Respiratory Tract Infection (URTI) was reported as the most common pre-existing morbidity. Bronchospasm was the main intraoperative complications occurred in 8 (6.67%) of the cases with URTI. After surgery 6(5%) patients experienced bleeding, 3(2.5%) patients needed to be reintubated. In addition, 2 (1.67%) instances had trouble controlling their pain, only 1(0.83%) patient had trouble swallowing and 1(0.83%) recovered slowly. **Conclusion:** Anaesthesia for surgical repair of cleft lip or palate in children is challenging. After a thorough preoperative evaluation, a trained anaesthesiologist should administer anaesthesia under strict supervision to minimize postoperative complications.

**Keywords:-** Anaesthetic Challenges, Cleft Lip, Palate Surgeries, malformation.

## INTRODUCTION

The most frequent craniofacial defects encountered globally are cleft lip and palate. Cleft lip can have serious social and psychological repercussions for both the

children and parents if it is not treated.<sup>[1,2]</sup> In various cultures all throughout the world, it is usual for families to be socially isolated or for children to be abandoned.<sup>[3]</sup> More than 5000 new patients with cleft lip and palate are born



each year.<sup>[4]</sup> In Bangladesh, there are 3.9 cases of cleft lip and/or cleft palate for every 1000 live births.<sup>[5]</sup> For the repair of cleft lip and palate, there are different methods.<sup>[6,7,8]</sup> Orofacial cleft deformity therapy is costly and takes a lot of time of specialist care.<sup>[9]</sup>

The "Kilners rule of 10" used to determine when surgery should be performed: for cleft lip, 10 weeks of age, 10 pounds, and a haemoglobin level of 10 gm/dl; for cleft palate, 10 months, 10 kilograms, and a haemoglobin level of 10 gm/dl. Neonatal cleft lip repair is no longer unusual when done by a skilled surgeon.<sup>[10,11]</sup> The anaesthesiologist faces difficulties while providing anaesthesia for cleft lip and palate surgeries.<sup>[12]</sup> Patients with clefts should ideally be managed by skilled cleft teams at specialized paediatric centers that can offer the facilities and skills.<sup>[13]</sup> General anaesthesia with endotracheal intubation and combined with local anaesthesia with adrenaline is the safest form of anaesthetic technique that is suggested.<sup>[13,14]</sup> Before administering anaesthesia, a number of considerations need to be taken into account. The age of the patient (usually newborns) and related congenital defects or medical disorders may make managing the anaesthesia for the surgical repair of orofacial clefts very difficult.<sup>[15]</sup> Intravenous tranexamic acid 10mg/kg as bolus administered 15 minutes before incision to reduce blood loss during surgery.<sup>[16]</sup> We carried out a retrospective observational study to identify the challenges and postoperative complications after cleft lip and palate surgeries.

## **MATERIAL AND METHODS**

A retrospective review of anaesthesia performed in Dhaka Dental College and

Hospital which is the largest dental hospital in Bangladesh. The study was conducted on cleft lip, cleft palate, and combination (cleft lip and palate) repairs from January 2022 to December 2022. To find out about every instance of orofacial cleft surgery during this time, hospital records were reviewed. Then, the identified patients' case reports were thoroughly investigated. A total number of 126 patients were operated during this time, but 120 of them were examined, and 6 of them were eliminated from the study due to inadequate documentation. The data review included demographic profile of the patients, diagnosis, suggested surgical technique, pre operative packed cell volume (PCV), vital signs, premedication, anaesthetic technique, induction technique, intubation aids, muscle relaxant used for intubation, analgesics used were noted. The anaesthesiologists, paediatricians, and surgeons all examined each patient prior to surgery. Patients who were clinically asymptomatic but had increased WBC counts were started on prophylactic antibiotics the day before surgery and taken when their WBC count fell the following day. Patients who had a drippy nose and a clear chest were included in surgery, whereas those who had a severe respiratory tract infection, wheezing, or creps were postponed. Additionally, anaemic patients weren't taken in for surgery. The cutoff level of haemoglobin was 10gm/dl. The patients' weight, preoperative fasting recommendations, anaesthesia type, excessive bleeding, any unfavorable surgical events or intraoperative problems were all obtained from records. From the anaesthesia records, the anaesthesia method and post operative complications were documented. Data were

analysed using SPSS 23 version and summarized into tables.

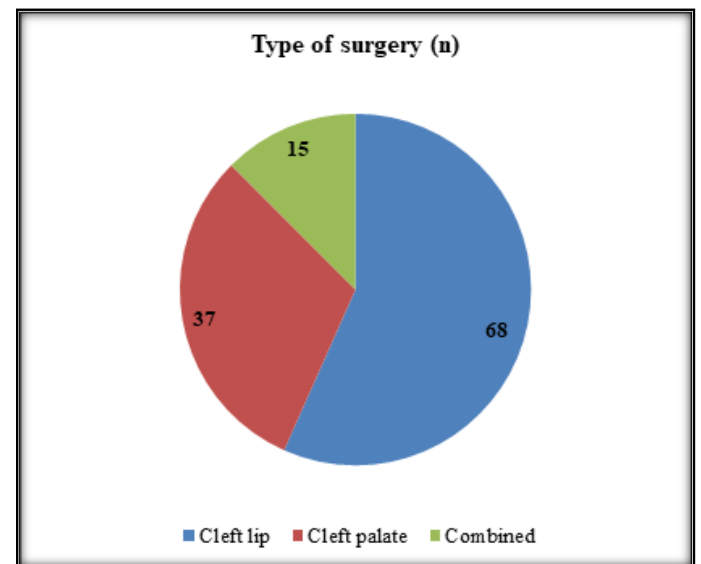
## RESULTS

In order to identify the anaesthetic difficulties in primary cleft lip and palate procedures, a retrospective investigation was conducted. 120 patients in all were reviewed during the investigation. All of the patients were Bangladeshi who underwent surgery at the Dhaka Dental College and Hospital. Each patient received a locally administered injection of lidocaine with adrenaline under general anaesthesia. Each patient must have a comprehensive evaluation by the anaesthesiologist prior to surgery to identify any intraoperative concerns. A suitable physical examination and pertinent preoperative testing are part of this study. In a hot climate, dehydration is a problem, so patients were advised to consume clear drinks up to 2 hours before operation. Our haemoglobin cutoff value was 10g/dl. Only 25(20.83%) of patients had haemoglobin levels 10 g/dl, whereas 85(70.8%) of participants reported having haemoglobin levels from 10.1 to 11.9 g/dl, and 10(8.4%) of participants had haemoglobin levels beyond 12 g/dl. Prior to surgery, intravenous preoperative antibiotics were given. All patients stayed 2 to 7 days in the hospital after surgery. Patients were given intravenous fluid to maintain hydration. Soft diet and oral antibiotics were also provided. According to availability, acetaminophen, ketorolac, and diclofenac sodium were used to maintain postoperative analgesia. As a maintenance fluid, D51/4NS (5% Dextrose + 0.225% Sodium chloride) & D51/2NS (5% Dextrose + 0.45% Sodium

chloride) were used according to age throughout the healing process until oral intake resumed.

[Table 1] shows the age and gender distribution of the patients. The ages ranged into 5 divided groups. Majority of the patients presented after 1st year of age. Most of them 54 (45%) came between 1-5 years of age. According to gender distribution, 67 (55.8%) were male and 53 (44.2%) were female patients.

According to type of surgery, 68(56.67%) underwent cleft lip surgery, 37(30.83%) for cleft palate surgery and the rest 15(12.5%) patients underwent combined cleft lip and cleft palate surgeries.



**Figure 1:** Type of surgery among patients

According to pre-existing comorbidities among patients, Upper Respiratory Tract Infection (URTI) was reported as the most common pre-existing morbidity 12(10%), 8(6.7%) patients had congenital cardiac conditions and various symptoms were present in 6(5%) of patients.

**Table 1:** Age and gender distribution of patients

Age	Male (n=67)	Female (n=53)	n=120	%
0-5 Months	6	4	10	8.4
6-12 Months	12	10	22	18.3
1-5 Years	28	26	54	45
6-10 Years	13	8	21	17.5
>10 Years	8	5	13	10.8
Total	67	53	120	100.0

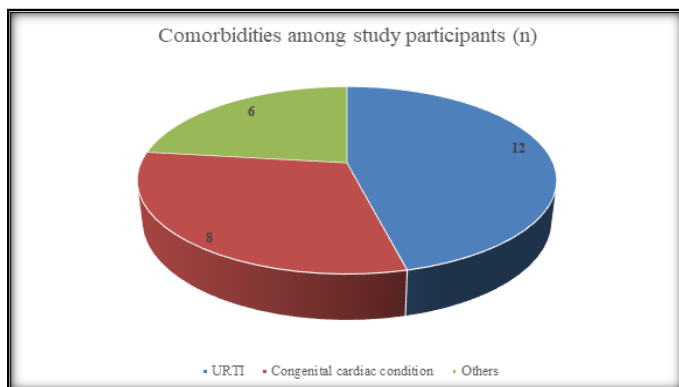
**Table 2:** Intraoperative complications among study participants

Complication	n=22	%
Bronchospasm	8	6.67
Difficult intubation	6	5
Bleeding	3	2.5
Decreased SpO2	2	1.67
Bradycardia	2	1.67
Failed intubation	1	0.83

Among the intraoperative complications, bronchospasm occurred in 8 (6.67%) patients who had URTI, difficult intubation occurred in 6(5%) cases, bleeding occurred in 3 (2.5%) cases, decreased SpO2 in 2(1.67%) cases, bradycardia happened in 2 (1.67%) cases and 1 (0.83%) case failed to be intubated.

**Table 3:** Postoperative complications among study participants.

Complication	n=13	%
Postoperative bleeding	6	5
Reintubation	3	2.5
Pain management	2	1.67
Difficulty in swallowing	1	0.83
Delayed recovery	1	0.83



**Figure 2:** Comorbidities among study participants

Postoperatively 6(5%) patients had bleeding and 3(2.5%) required reintubation. In addition, 2 (1.67%) cases experienced difficult pain management and only 1(0.83%) had difficulty in swallowing and 1 (0.83%) patient experienced delayed recovery.

## DISCUSSION

A one-year retrospective analysis on cleft lip, cleft palate, and combination (cleft lip and palate) repairs was done at the Dhaka Dental





College and Hospital. Total number of 120 cases was reviewed in this study. Among them 67(55.8%) patients were male and 53 (44.2%) were female. The majority of patients arrived after their first year of life and 54 (45%) of them were children under the age of five. Previous studies reported similarly that the majority of cases presented after the first year of life.<sup>[17,18,19]</sup>

The choice of the patient during preoperative evaluation is essential for the safety of general anaesthesia during facial cleft surgery. The results of the study showed that 68 (56.67%) individuals had cleft lip surgery, 37 (30.83%) had cleft palate surgery, and the remaining 15 (12.5%) patients had both cleft lip and cleft palate procedures. Under general anaesthesia with endotracheal intubation, each patient had a local injection of lidocaine with adrenaline. Cleft lip and cleft palate surgery is usually performed on infants and young children, who required general anaesthesia.<sup>[19]</sup> A thorough preoperative anaesthetic assessment should be carried out, taking comorbidities and symptoms related to orofacial clefts into consideration.<sup>[3]</sup> Using intravenous tranexamic acid 10mg/kg as bolus 15 minutes before incision prevented intraoperative bleeding & improved surgical field.<sup>[16]</sup> This study has shown us that more than three intubation attempts are harmful. Holding off the case for six months increased the likelihood that symptomatic infants would successfully intubated.<sup>[18]</sup> Upper respiratory tract infection (URTI) were listed as the most prevalent pre-existing comorbidity among patients, accounting for 12 (10%) of them. The risks of anaesthesia or severe respiratory events should be evaluated against the benefit of the procedure on an individual basis considering

surgical repair minimizes URTI.<sup>[21]</sup> Eight patients (6.7%) had congenital heart conditions. When a patient has several comorbidities, it may be preferable to postpone cleft surgery until their health is at its best and the risks and benefits are more favorable.

Bronchospasm occurred in 8 (6.67%) of the URTI patients who experienced intraoperative complications, difficult intubation occurred in 6 (5%) patients, bleeding occurred in 3 (2.5%) of the cases, decreased SpO<sub>2</sub> occurred in 2 (1.67%) and bradycardia occurred in 2 (1.67%) of the cases. In this study, only one incident of unsuccessful intubation was reported, possibly because the anaesthesiologist expected every patient as having a potentially challenging airway and prepared for it well in advance. Another study suggested that intubation difficulties, bronchospasm, and airway blockage were the main intraoperative complications.<sup>[22]</sup>

The care after surgery is essential. The postoperative management of these patients includes intravenous antibiotics and fluids, local wound care, oral antibiotics, and analgesics.<sup>[23]</sup> In our study, post-operatively 6(5%) had bleeding and 3(2.5%) required reintubation. Only 1(0.83%) patient experienced swallowing difficulties, 1(0.83%) patient had a delayed recovery and 2 (1.67%) instances had trouble managing their pain and discomfort.

### Limitations of The Study

The present study was conducted in a very short period due to time constraints and funding limitations. The small sample size was also a limitation of the present study.



## CONCLUSIONS

Surgery for cleft lip and cleft palate requires challenging anaesthesia. Most patients who need to have their cleft lip and palate repaired are children. The safest form of anaesthesia is general anaesthesia with endotracheal intubation. Along with intraoperative and postoperative complications, we observed that URTI was the main preoperative challenge. We recommend general anaesthesia with regulated ventilation in combination with local

anaesthesia with adrenaline for cleft lip and palate surgery.

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