

Pattern and clinical profile of patients with cleft lip and palate at pediatrics surgical hospital in Ethiopia

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Abstract

Background: Cleft lip and palate are among the most common congenital anomalies of the head and neck region. Oral-facial clefts can be observed on the lips, jaw bones, and hard and soft palates. This study aimed to assess the Pattern, clinical of children with cleft lip and/or palate who visit CURE Children's Hospital Ethiopia.

Methods: A retrospective chart review was conducted on patients who were operated from January 1, 2016 to December 31, 2022, at the Cure Children's Hospital in Ethiopia. The Demographic and clinical data of cleft patients were collected using Smile Train Express (STX). The collected data underwent analysis using descriptive statistics with SPSS version 26.

Results: The study included 1379 surgeries done on patients with non-syndromic cleft palate or lip. The average age at surgery was 21 months, with a male-to-female ratio of 1.78:1. The left side was the most affected, and it was unilateral. The commonest surgery done was primary unilateral lip-nose repair, with 694 (50.3%). The most common surgical technique used is Millard rotation advancement 823 (59.7%). Regarding post-operative complications, palatal fistula surgeries done for 73 (8.3%) patients and lip and nose revisions done for 38(2.75%).

Conclusion: The study reveals the common form of presentation was a left-sided, unilateral cleft lip, which is treated with unilateral lip-nose repair. The high magnitude of the palatal fistula is also reported, with the most common millard rotation advancement surgical treatment in the study area. Therefore, policymakers and health planners should strengthen early treatment of congenital anomalies in children and create awareness about the availability of treatment to prevent long-term deformities related to cleft lip and palate.

Keywords: Cleft lip, Cleft palate, CURE, Ethiopia

Background

Oral-facial clefts are among the most common congenital malformations of the head and neck and can occur on the lip only (CL), the alveolar (CA) or involve both the lip and alveolar, affect the palate (CPO), or involve both the lip and palate (CLP). Oral-facial clefts can be observed on the lips, jawbones, and hard and soft palates. Failure of fusion of the medial nasal, lateral nasal and maxillary prominences on one or both sides result in clefts of the lip and palate. A partial fusion will result in an incomplete cleft (1,2).

The prevalence of CLP varied depending on ethnicity, race, geography, or gender. The prevalence is 1 per 700 live births worldwide, with Asia having the highest rate (1/500), Caucasians having the intermediate rate (1/1000), and Africa having the lowest prevalence (1/2500). The incidence of CLP is 2 times higher in men than in women (3,4).

The incidence of orofacial clefts varies greatly throughout African populations, ranging from 0.3/1,000 in Nigeria to 1.65/1,000 in Kenya(5,6). A study done in multiple governmental hospitals in Addis Ababa, the capital city of Ethiopia, found an incidence of 1.49 per 1000 live births or 1 in 672 live births (7) .A single hospital-based study showed the incidence of CLP was 0.44 per 1,000 live births and a community prevalence of 0.20 per 1,000(8).

Study done in Yekatit 12 Hospital medical college showed the commonest presentation is the combination of Cleft lip and palate in 1006 (52.9%) of the patients, cleft lip Only accounts 731 (38.4%), lip and palate and 166 (8.6%) had cleft palate only. The most frequent operation is primary unilateral lip nose repair(9).

The American Cleft Palate and Craniofacial Association (ACPCA) recommends that primary cleft lip surgery should ideally be performed between the ages of 6 and 12 months, and by 18 months for primary cleft palate surgery. Early surgical repairs aim to improve appearance, speech, hearing, psychological development, and social integration barriers (10).

In Ethiopia, there was no standardized cleft care program prior to 2003. After 2007, Smile Train and Transforming Faces, both charity organizations, started to support free cleft care in Ethiopia (9).Currently several hospitals across the nation started CLP services. CCHE has been providing comprehensive cleft care in collaboration with Smile Train since 2008 and Transforming Faces since 2019. This

study aimed to assess the Pattern, clinical of children with cleft lip and/or palate who visit CURE Children's Hospital Ethiopia.

Methods

Study setting, design, period, and population

A retrospective chart review was conducted at the CURE Children's Hospital Ethiopia (CCHE), a pediatrics surgical hospital located in Addis Ababa, Ethiopia, that provides specialized services in pediatric orthopedics and plastic surgery with an annual visit of more than 13,000 patients and more than 3000 surgeries per year (11). CCHE have designated ward for Plastic surgery patients. The CCHE is one of eight hospitals in the CURE network. All patients who underwent surgery between January 1, 2016, and December 31, 2022, for which complete data were available, were included in this study.

Study variables

This study assessed the following variables: gender, address of the patients, type of cleft, cleft laterality, age at operation, type of surgery, and complication.

Data collection and tools

The Patient's demographic and clinical data was retrieved from the Smile Train database. Smile Train offers its own electronic records system for operated patients called Smile Train Express (STX), which we used as a data source. Data collected by trained nurse.

Data Processing and Analysis

Data analysis was done using SPSS version 26 and the frequency and proportion functions, and the results were presented using frequency tables and figures. Ethical clearance was obtained from the Institutional Review Board for CURE International Protocol Number CNR/003/2022. Smile Train gave permission for the use of the database.

Results

Socio-demographic characteristics of participants

This study included 1379 cleft surgeries done during the period of 2016–2022, of which 883 (64%) were male and 496 (36%) were female, with a male-to-female ratio of 1.78:1. The largest portion of patients were from Addis Ababa at 792 (57.4%), followed by the Oromia region at 338

(24.5%); and 150 (10.9%) were from the Amhara region. The average age at surgery is 21 months. Eight six (6.2%) patients referred from other health institutions for secondary operations (see table 1).

Table 1: Sociodemographic characteristics of patients in CCHE from January 1, 2016 to December 31, 2022

Sex	Frequency (n)	Percent (%)
Female	496	36
Male	883	64
Location		
A. A	792	57.4
Oromia	338	24.5
Amhara	150	10.9
Southern	61	4.4
Dire	12	0.9
Gambela	2	0.1
Harari	2	0.1
Afar	10	0.7
Somali	6	0.4
Tigray	6	0.4
Age		
<1	679	49.2
1-5	619	44.8
>5-10	62	4.4
>10	24	1.7
Total	1379	100
Referral	86	6.2

Clinical profile

The distribution of orofacial clefts in this study was CLP 833 (63.9%), CLO 491 (35.6%), and CPO 48 (3.4%). Cleft lips prevalent on 1324 people, with 1164(87.9%) having unilateral and 160 (12.1%) having bilateral, with common involvement on the left side. A total of 881 patients had cleft palates, with 483 (54.8%) having unilateral cleft palate and 398 (45.2%) having bilateral and left side involvement. There is soft palate involvement in 803 (63.4%), and almost all of them were complete defects, and 7 of them were submucosal. The involvement of the alveolus seen in 576 (45.5%) and soft palate involvement in 803 (63.3%). In all cleft types, complete is the most common, and the left side is more involved than the right (see table 2).

Patter of patient visit

The number of patients operated on at CCHE showed a more than fourfold increase, from 76 in 2016 to 336 in 2022, from the beginning. There was a decrease in 2019 and 2020.

Operations

The commonest surgery done was primary unilateral lip/nose repair 694(50.3%), followed by primary cleft palate repair 373(29%), bilateral unilateral lip/nose repair 206 (14.9%), and alveolar bone graft surgery 38 (2.75%).

Table 2: Distribution individuals with cleft lip and/or palate from January 1,2016 to December 31,2022

Classification of cleft	Frequency (%)	Affected side	Frequency (%)
Cleft Lip only	491 (35.6%)		
Cleft Palate only	48 (3.4%)		
Both Cleft Lip and Palate	833 (63.9%)		
Lip			
Unilateral Lip Bilateral Lip Total lip	1164 (87.9%) 160 (12.1%) 1324 (100%)	Left Lip Complete	666 (48.3%)
		Left Lip Incomplete	290 (21%)
		Left Lip Not Cleft Lip	423 (30.7%)
Right Lip Complete Right Lip Incomplete Right Lip Not Cleft Lip		Right Lip Complete	524 (37.3%)
		Right Lip Incomplete	232 (16.8%)
		Right Lip Not Cleft Lip	633 (45.9%)
Palate			
Unilateral Palate Bilateral Palate Total palate	483(54.8%) 398 (45.2%) 881(100%)	Left Hard Palate Complete	631 (45.8%)
		Left Hard Palate Incomplete	53 (3.8%)
		Left Hard Palate Not Submucosa	693 (50.3%) 2 (0.1%)
Right Hard Palate Complete Right Hard Palate Incomplete Right Hard Palate Not Hard Palate Cleft Right Hard Palate Submucosa		Right Hard Palate Complete	555 (40.2%)
		Right Hard Palate Incomplete	38 (2.8%)
		Right Hard Palate Not Hard Palate Cleft Submucosa	784 (56.9%) 2 (0.1%)
Alveolus			
Alveolus Left Complete Alveolus Left Incomplete Alveolus Left Not Alveolus Cleft		Alveolus Left Complete	628 (45.5%)
		Alveolus Left Incomplete	173 (12.5%)
		Alveolus Left Not Alveolus Cleft	578 (41.9%)
Alveolus right Complete Alveolus right Incomplete Alveolus right Not Alveolus Cleft		Alveolus right Complete	489 (35.5%)
		Alveolus right Incomplete	136 (9.9%)
		Alveolus right Not Alveolus Cleft	754 (54.7%)
Soft Palate			
Soft Palate Complete Soft Palate Incomplete Soft Palate Not Soft Palate Soft Palate Submucous		Soft Palate Complete	821 (59.5%)
		Soft Palate Incomplete	43 (3.1%)
		Soft Palate Not Soft Palate Submucous	507 (36.8%) 7 (0.5%)

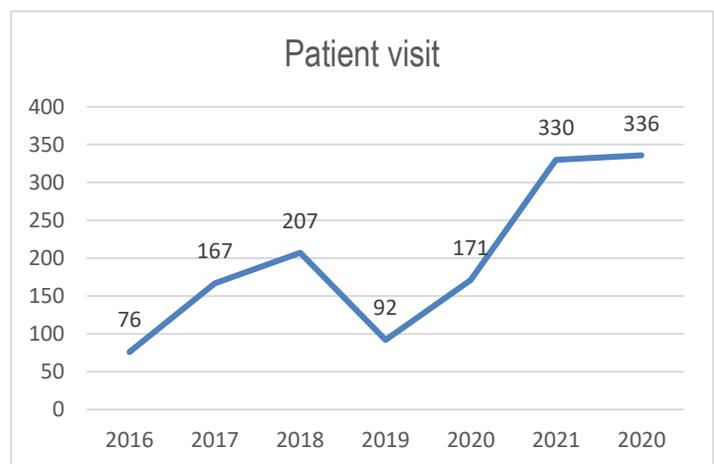


Figure 1: Pattern of surgeries in from January 1, 2016 to December 31, 2022.

Rotational advancement and variations Millard 823 (59.7%) were the most commonly used surgical techniques, followed by veau-wardill-kilner 364 (26.4%) and straight-line surgery for 269 (19.5%) (See table 3).

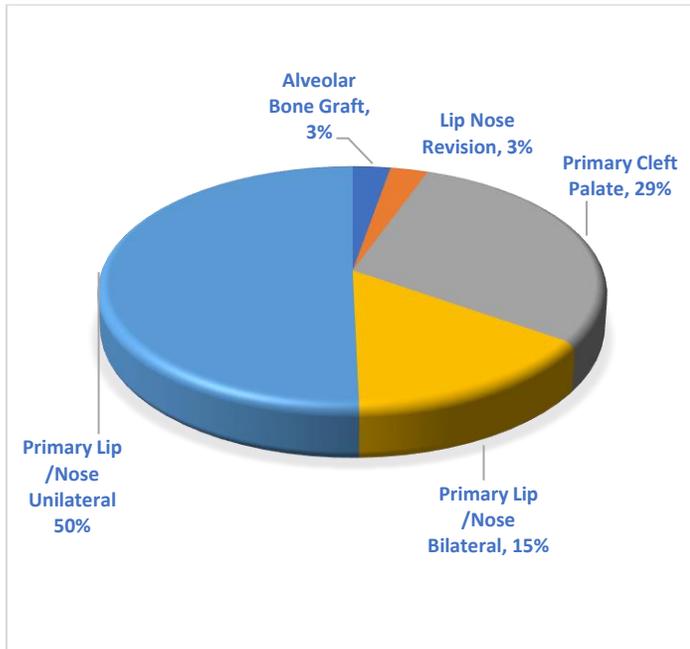


Figure 2: Proportion of surgeries performed in CCHE from January 1, 2016 to December 31, 2022

Table 3: Distribution of surgical techniques performed from January 1, 2016 to December 31, 2022.

Repair type	Frequency (n)	Percent (%)
Rotation/Advancement and Variants (Millard)	823	59.7
Veau Wardill Kilner	364	26.4
Von Langenbeck	20	1.5
Straight Line	269	19.5
Alveolar Bone Graft	38	2.8
Lateral repair	29	2.1
Local Palatal Flaps	24	1.7
Rose Thompson (Veau III)	3	0.2

In terms of post-operative complications, 73 patients had palatal fistulas, accounting for 8.3% of all palatal repair surgeries, while 38 patients had lip and nose revisions, accounting for 2.75% of all lip surgeries.

Discussion

Among the 1379 operations, a large portion of the patients 792(57.4%) were from Addis Ababa. This is probably because of geographical vicinity since this center is situated in Addis Ababa and CCHE was accepting only from Addis Ababa during restrictive measures in the initial stage of COVID 19 pandemic, followed by Oromia region 338 (24.5%). This study showed majority of affected were male with most cases being left-sided and unilateral type similar study done in India and Madagascar have the similarly findings (12–14).

This study showed the average patient's age during surgery was 21 months, and half of the operations were done before turning a year old. More than 40% of the current study participants had CLO surgery at the age of six months. which is a significant improvement over previous studies in Ethiopia and African countries, which revealed that the majority of them were performed after the age of five (14,15). A 10-year investigation conducted across several African nations revealed that patients' average age at surgery was 9.34 years (4). Similarly, studies conducted by Smile Train in developed nations with multicenter settings revealed that the average patient age at surgery for CLP surgery was 33.14 months as opposed to 19.5 months for CL surgery (16).

This study showed a combination of cleft lip and palate is the most common cleft type with (833 ,63.9%), followed by CLO in 491 (35.6%) patients; the same finding from a study conducted at Yekatit 12 medical collage at CLP is 1006 (52.9%), followed by CLO in 731 (38.4%) patients(9) .Regarding cleft laterality the majority of patient affected is left side in all types cleft which is supported by studies form similar setting (9,17).

The number of patients operated on at CCHE is increasing from 76 in 2016 to 336 in 2022, a more than fourfold increase from the beginning. In spite of the increase, there is a decrease in 2019 and 2020. This is due to temporary service interruptions in 2019 and COVID-19 prevention and restriction measures implemented by the government starting from March 2020, as well as our hospital precautionary measures. Similar COVID -19 effect seen in similar studies (16,17).

Primary lip/nose repair was the most common surgery performed in this study, with unilateral repair being the most common 694(50%), followed by primary cleft palate repair 403(29.1%), and bilateral repair 206 (14.9%). According to the findings of a similar study conducted at Yekatit 12 Hospital medical college , the most commonly performed surgery was primary unilateral lip/nose repair 937 (50.7%), followed by primary cleft palate repair with 512 surgeries (27.7%) (9).

After undergoing surgery, there were no death records, and regarding complications, the prevalence of palatal fistula in this study was 8.3% slightly lower than evidence from A systematic review of 44 studies that included participants from all continents found that CLP is prevalent in 91.2% and CLO is prevalent in 8.8%. There were 8.6% fistulas in total. In surgeries of cleft lip and cleft palate, the incidence of fistula was

17.9%, which was considerably greater than in surgeries of cleft palate alone (5.4 %) (18).

Secondary lip and nose revisions done for 38 patients accounting for 2.7% of all lip surgeries. which is much lower than similar studies where the prevalence varied from 28% for unilateral complete clefts of the lip to 67% for bilateral complete clefts of the lip this may be attributed to early surgery time (19).

Since the study is single hospital-based, its retrospective nature has limitations for generalization. However, the findings can serve as a foundation for investigations of greater scope at the hospital level or at the national level.

Conclusion

The study reveals the common form of presentation was a left-sided, unilateral cleft lip, which is treated with unilateral lip-nose repair. The most common surgical technique used were Millard rotation advancement. Therefore, policymakers and health planners should strengthen early treatment of congenital anomaly in children and awareness creation on availability of treatment to prevent long-term deformity related to cleft lip and palate.

Abbreviations

CCHE: CURE children's Hospital Ethiopia

CLO: Cleft lip only

CLP: Cleft lip and palate

CPO: Cleft palate only

Declarations

Consent for publication

Not applicable.

Ethical declaration

The current manuscript had ethical approval from CURE International IRB committee.

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Authors' contributions

TM conceived the study, the study design, Supervision, and revision of the final manuscript. FD reviewed the literature, wrote the original draft, and performed the statistical analysis. Both authors read and approved the final version of the manuscript.

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Competing interest

Both authors read and approved the final manuscript. The authors declare that they have no competing interests.

Availability of Data and Materials

The datasets used in the current study or data collection tool are available from the corresponding author with a reasonable request.

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