Japan Journal of Otolaryngology

journal homepage: https://jjo.edwiserinternational.com

Original Article

Cleft lip and palate surgery in the Otolaryngology and Head-neck surgery department of a Medical College Hospital in Bangladesh

Sudhangshu Kumar Ballav[1,*], Debbroto Ganguly[2], SK Farid Uddin Ahmed[3] and Susmita Ballav[4]

[1]*Department of ENT & Head-Neck Surgery, Khulna City Medical College, Khulna, Bangladesh*
[2]*250 bed General Hospital, Khulna, Bangladesh*
[3]*Department of Anethesiology, Khulna City Medical College, Khulna, Bangladesh*
[4]*Khulna City Medical College, Khulna, Bangladesh*

ARTICLE INFO

Received 29 July 2024
Revised 25 August 2024
Available Online 01 September 2024

Keywords:
Cleft lip (CL)
Cleft palate (CP)
Cleft lip and palate (CLP)
Cheiloplasty
Palatoplasty
Pre-alveolar
Alveolar

ABSTRACT

Background: Cleft lip and palate (CLP) are one of the most common developmental anomalies in orofacial region. CLP surgery lies in the anatomical domain of Ear Nose Throat and Head - Neck Surgery. In Bangladesh specialty of plastic surgery is still in developing stage and plastic surgeons are not easily available everywhere. ENT and Head-Neck surgeon had to take up the responsibility of some of cleft patients. This article is a retrospective analysis of a series of 200 cases of cheiloplasty and palatoplasty done in ENT and Head-Neck Surgery department of Khulna City Medical College Hospital, Bangladesh. Results were satisfactory in our, patient and parent's consideration.

Objective: Our aim is to discuss the demographic profile, presentations, degree & type of cleft and outcome of CLP surgery in Otolaryngology and Head-Neck Surgery department of a Medical College Hospital of Bangladesh. We will also discuss the embryology of face & historical background of the cleft surgery.

Materials and Methods: This is a retrospective analysis of CLP surgery for 200 cleft patients. We based on inclusion and exclusion criteria for selection of patients. Majority of cleft lip patients were operated following the Millard modified rotation advancement technique and isolated cleft palate patients were operated following Von Langenbeck bipedicle flap and Veau-Wardil-Kilner V-Y pushback technique in the ENT and Head-Neck Surgery Department of a Medical College Hospital. Patients were advised for periodic follow up.

Results: Total of 200 patients of CLP were operated in our department out of which male was 92 (46%) and female was108 (54%)), male and female ratio being 1:1.08. The age range was 3 months to 40 years with a mean of 8.38 years. Pre alveolar group both male and female comprised of 134 (67%) and alveolar group 66 (33%) patients and that of isolated cleft palate 7 (10.60%) patients. Pre alveolar unilateral CLP was high. The results of surgery were satisfactory in our postoperative evaluation. Patients and parents were also satisfied with the outcome.

Conclusion: Majority of CLP patients don't suffer functional problem apart from facial disfigurement. Restoration of normal anatomy, facial appearance and function can be achieved by surgery in appropriate time and age. Few cases may be associated with feeding difficulties, dental and hearing problems. Some cases are associated with other congenital

anomalies and syndromes. Those cases demand team approach of different specialty.

Introduction

Cleft lip and or palate are not an infrequent congenital developmental defect in upper lip, alveolus, and palate together or isolated cleft lip with or without cleft of alveolus or palate. Majority of cases have cleft in upper lip only either unilateral or bilateral. In few cases cleft in upper lip is associated with cleft of alveolus or palate. The colloquial name of this defect is harelip as hares have cleft in upper lip as normal [1]. The cleft lip developed due to failure of fusion of frontonasal and maxillary process of variable degree resulting in variable extent of cleft lip, alveolus, and palate. Incomplete cleft does not involve alveolus and nostril floor, while complete cleft involves both alveolus and nostril floor [2]. Cleft palate developed as a failure of fusion of palatal shelves of maxillary process resulting in cleft of hard and or soft palate [2]. Cleft lip and palate can develop isolated or in association with various combination with or without other developmental anomaly particularly congenital heart diseases. These are also associated with as part of many recognized syndromes [3]. In developing countries like our prenatal care is not adequate and accessible to all. CLP is a bolt from the blue for the parents. They rely more on religious belief that CLP is a curse from supernatural and sometimes male family members used to accuse the mother because of giving birth a defective child [4]. The incidence of CLP is nearly 1 per 1000 live birth and there is significant variation on geographic location, ethnic group, type and degree of CLP [5].

Methods

This is a retrospective observational study that described the demographic profile, type and degree of CLP and outcome of cheiloplasty and palatoplasty done in the Otolaryngology and Head-Neck Surgery department of Khulna City Medical College Hospital, Bangladesh between January 2021 to December 2023.

This study sample comprised of 200 patients. All patients were selected from the outpatient department of Otolaryngology and Head-Neck Surgery and CLP camp held in this hospital.

Inclusion criteria were CLP patients of any age and exclusion criteria was CLP patients with associated other congenital anomalies, CLP patients with recognized syndromes. We divided patients into 3 groups as follows:

Pre alveolar clefts: This group comprises of those patients with unilateral and bilateral cleft of lip with intact alveolus. Apart from disfigurement, patients do not suffer difficulties in feeding, speech, dentition & hearing.

Alveolar clefts: This group consists of patients with a combination of unilateral and bilateral cleft lip alveolus and palate. There is complete division of soft tissues of lip alveolus and palate.

Only cleft palate: Cleft palate without cleft lip.

All patients enrolled for CLP repair were examined clinically and investigated to exclude associated other congenital anomaly and fitness for general anesthesia. Screening test of hearing was done for suspected cases of hearing loss. Front face photograph was taken. Millard rotation advancement flap technique was applied to pre alveolar and alveolar unilateral and pre alveolar bilateral CLP cases for cheiloplasty (Figures 1-6).

Alveolar bilateral CLP cases were repaired by Veau-3 technique (Figure 7 and 8). There was much protruding premaxilla in alveolar bilateral complete CLP cases (Figure 9). In that case in first stage surgical setback of protruding premaxilla and in second stage lip repair was done (Figure 10-1). In one case surgical setback of premaxilla and repair of lip was done in one stage (Figure 13& 14).

Isolated complete and incomplete cleft palate was repaired by Von Langenbeck bipedicle flap and Veau-

*Corresponding author: Prof. (Dr.) Sudhangshu Kumar Ballav, Professor and Head of the Department of ENT & Head-Neck Surgery, Khulna City Medical College, Khulna, Bangladesh.

https://doi.org/10.31531/edwiser.jjo.1000106

Wardil-Kilner V-Y pushback technique (Figure 15 and 16). Cleft lip with cleft palate cases lip was repaired in first stages and palate in second stage.

Surgical repair of CLP was done under general anesthesia with local infiltration of 1% lidocaine with 1:100000 adrenaline and kept admitted into hospital and discharged 72 hours after surgery. The skin test was done to exclude hypersensitivity of local anesthetic with adrenaline prior to infiltration. The timing of operation was decided as per rule of 10 that means 10 pounds of body weight, 10 months of age and 10 gram percentage of hemoglobin. Few patients from alveolar and isolated cleft pate group had conductive hearing loss and for those patients we did myringotomy and grommet insertion in addition in the same sitting.

All patients were followed at 5th post operative day for removal of lip stiches. For isolated cleft palate cases absorbable suture material was used and need not to be removed. All patients were followed up to 3 months to 1 year to see results. Preoperative front face photograph and post operative serial photograph were taken during follow up. The outcome measurement of surgery was evaluated by observing the scar, lip symmetry, cupid's bow, vermilion border, alar dome, and patients whistling ability of older children.

Table 1: Sex distribution (*n*=200).

Total no. of patients	Male	Female	M: F
200	96 (48%)	104 (52%)	1: 1.08

Table 2: Age distribution (*n*=200).

0 - 5 years	6 - 12 years	13 - 18 years	Above 18 years
70 (35%)	78 (39%)	45 (22.5%)	07(3.5%)

Table 3: Group distribution, side, and type of CLP (*n*=200).

Group	No. of patients & %	Male	Female
Pre alveolar	134 (67%)	74 (55.22%)	60 (44.77%).
Left unilateral	90(67.16%)	48 (53.33%)	42 (46.66%)
Right unilateral	30 (22.38%)	16(53.33%)	14 (46.66%)
Bilateral	14 (10.44%).	8 (57.14%)	6 (42.85%)
Alveolar	66 (33%)	36 (54.54%)	30 (45.45%)
Left unilateral	30 (50.84 %)	17 (56.66%)	13 (43.33%)
Right unilateral	19 (28.78%)	11(57.89%)	8 (42.10%)
Bilateral	10 (15.15%)	6 (60%)	4 (40%)
Isolated cleft palate	7(10.60%)	4 (57.14%)	3 (42.85%)

Results

200 Patients enrolled in this study including male 92 (46%) and female 108 (54%)), mean age of patients 8.38 years and male female ratio 1:1.08 (Table 1). Age ranged from 3 months - 40 years. Age distribution was as 0 - 5 years, 70 (35%), 6 - 12 years, 78 (39%), 13-18 years, 45(22.5%), 19 - 40 years, 07 (3.5%) (Table 2). Pre alveolar group both male and female comprised of 134 (67%) and alveolar group comprised of 66 (33%) patients. In pre alveolar group male was 74 (55.22%) and female was 60 (44.77%). In pre alveolar group left unilateral 90(67.16%) cases and right unilateral 30 (22.38%) and bilateral 14 (10.44%).

The alveolar group comprised of 66 (33%) of which male was 36 (54.54%) female was 30 (45.45%). In alveolar group left unilateral 30 (50.84 %), Right unilateral 19 (28.78%), bilateral 10(16.94%) and isolated cleft palate 7 (10.60%) (Table 2). In Pre alveolar group majority cases were Left unilateral 67.16%.

Pre alveolar group suffered no functional problems apart from disfigurement. No failure was found in these cases. Only 8 (4%) alveolar cleft lip patients developed infection and wound dehiscence. The failed cases opted for second surgery after 3 months. The outcome measurement of CLP surgery was evaluated by clinical examination and comparing pre and post operative front

face photograph. During follow up in few cases we found mild notching at vermillion border, shortening of vertical height and partial correction of alar deformity. For correction of notching we opted for revision, but none agreed. The overall outcome of CLP repair was satisfactory from our side and patient's side.

Figure 1: Preoperative.

Figure 2: 3-months postoperative.

Figure 3: Preoperative.

Figure 4: Postoperative.

Figure 5: Preoperative.

Figure 6: Postoperative.

Figure 7: Preoperative.

Figure 8: 1-year Postoperative.

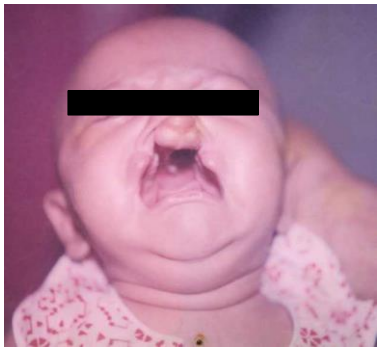

Figure 9: Preoperative at 3-months.

Figure 10: 3-months after 1st stage Premaxilla setback.

Figure 11: 2nd stage lip repair.

Figure 12: After 1-year of 2nd stage surgery.

Figure 13: 1st stage, premaxilla setback and lip repair.

Figure 14: 5th POD.

Figure 15: Isolated CP Preoperative.

Figure 16: Post operative.

Discussion

Significant number of CLP patients are attending to Otolaryngologist and Head-Neck Surgeons of Bangladesh as the defects lies in the anatomical domain of ear, nose, throat head and neck region. Well organized multidisciplinary CLP team is not available in any institution here. Therefore, with many limitations we tried our best to provide acceptable service to CLP patients attending to us. The mean age of our patients was relatively high 8.38 due to late presentation which is common for our situation. Delay in presentation may be due to ignorance, superstitious belief, and lack of availability of service. In recent years the situation started changing due to coming forward to deal the problems by NGOs like smile train Bangladesh, Cleft Australia Bangladesh, and Cleft Bangladesh. The sex distribution of patients in this study showed slightly higher male preponderance and higher incidence of pre alveolar cleft consistent with epidemiological data of CLP (6). Consistent with other studies we found left unilateral cleft are more than right [6,7].

The 1st report of cleft lip repair was published in western literature by "Ambrose Pare" in 16th century. It was a straight-line repair leaving a notch on vermilion border. In 1955 Millard D Ralph introduced rotation advancement technique & he did his 1st operation in Korea. The procedure was upper lip Z-plasty type of repair. Since then, there happened numerous finer modifications to address the associated alar deformity during primary lip repair. Despite numerous techniques Millard's technique remained the gold standard in majority of cases of cheiloplasty. We adopted his technique in pre alveolar and alveolar unilateral cases that outnumbered other groups. We adopted Veau 3 technique for alveolar bilateral cases.

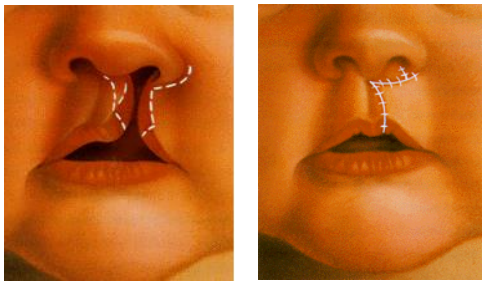

Figure 17: Diagram of Millard Technique.

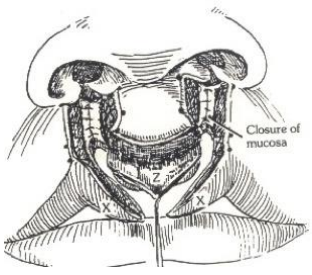

Figure 18: Diagram of Veau-3 technique.

In some alveolar CLP patients' premaxillae protruded anteriorly due to unrestricted growth affecting feeding speech and esthetic appearance with psychological concern to patient and family and it remains as challenge for surgeons [8]. In cases of severe protruding premaxilla there are reports of one stage repair of cleft lip by vomerine osteotomy and setback of premaxilla [9,10]. We did 2 cases by first stage surgical setback of premaxilla followed by lip repair at interval of 3 months and 2 cases at one stage.

Isolated cleft palate cases were repaired at 2 years of age. Isolated cleft palate was only 7 patients (10.60%) in our series. We had done palatoplasty by Von Langenbeck's bipedicle flap and Veau-Wardil-Kilner V-Y pushback technique. The aim of surgery was to close the gap to prevent nasal regurgitation and development of normal speech. Cleft palate repair should be done between 18 months to 2 years, the time for speech development. The mean age of cleft palate repair in our small number of patients is high due to late presentation. The late presentation may be due to invisibility of the defect as that of cleft lip. Parents were not aware until they noticed speech impairment.

As there is no internationally accepted outcome measurement scoring system we measured the outcome of CLP repair by visual observation of scar, lip symmetry, cupid's bow, vermilion border, alar dome, and parents' satisfaction.

Limitations

The overall management of CLP patients' needs multidisciplinary expertise of CLP team of orthodontics, speech therapist, pediatrician, orthopedics, nutritionist, psychotherapist, maxillofacial specialist which is not yet developed in developing countries. In recent time international organizations like Smile train, Cleft Australia Bangladesh, Cleft Bangladesh is taking initiative to provide comprehensive multidisciplinary service to CLP patients in near future.

Conclusion

The consensus is that management of CLP patients' needs multidisciplinary approach for best management up to adolescence. The majority of CLP patients belong to pre alveolar group. This group of patents suffer no functional disability apart from disfigurement and they can be treated by ENT surgeons trained to learn only modified Millard rotation advancement technique. This is easy to learn and practice the outcome of which is satisfactory.

Ethical approval

Patient consent has been taken for publication.

Conflict of Interest

The authors declare no conflict of interest.

Funding

The authors did not receive any fundings from any private or government sources.

References

1. Tarun V, Pravakor G, Sachin K, Rajat G, Tanu G et al. Cleft of lip and palate: A review J Family Med Prim Care. 2020 Jun;9(6):2621-2625.
2. Semer N. Practical plastic surgery for nonsurgeons. Philadelfia: Hanley & Belfus, Inc;2001. pp 235-43.
3. Gaurishankar S. Textbook of orthodontics. 1st ed. Paras Medical Publication;2011.
4. Medwick L, Synder J, Schook C, Blood E, Brown S, White W. Causal attributes of cleft lip and palate across cultures. Cleft Palate Craniofac J. 2013; 50:655-67.
5. Allan E, Windson J, Stone C. Cleft lip and palate: Etiology, epidemiology, prevention and intervention strategies. Anat Physiol.2014; 4:1-6.
6. Butali A, Adeyemo WL, Mossey PA, Olasoji HO, Onah II, Adebola A, et al. Prevalence of orofacial clefts in Nigeria. Cleft Palate Craniofacial J. 2014;51:320.
7. Azeez B, Keyla PR, Deborah VD, Ronald M, Mekonen AE, Wasiu LA, et al. Descriptive epidemiology of orofacial clefts in Africa using data from 46,502 Smile Train surgeries. J Public Heal Epidemiol. 2017;9:114–21.
8. Fakih-Gomez N, Sanchez-Sanchez M, Iglesias-Martin F, Garcia-Perla-Garcia A, Belmonte-Caro RGonzalez-Perez LM. Repair of complete bilateral cleft lip with severely protruding premaxilla performing premaxillary setback and vomerine osteotomy in one stage surgery. Med Oral Patol Oral Cir Bucal. (2015).
9. Butali A. Unilateral cleft lip repair: A comparison of treatment outcome with two surgical techniques using quantitative (anthropometry) assessment. J Korean Assoc Oral Maxillofac Surg. 2018;44:3–11.
10. Murthy J, Primary bilateral cleft lip repair with management premaxilla without preoperative orthopedics. J cranifac Surg. 2009; 20:1719-22.

Citation: *Ballav SK, Ganguly D, Ahmed SKFU, et al. Cleft lip and palate surgery in the Otolaryngology and Head-neck surgery department of a Medical College Hospital in Bangladesh. Japan J Otolaryngol 2024; 5(1): 131. doi: 10.31531/edwiser.jjo.1000106*