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Assessment of Two Years of Free Surgical Treatment of Cleft Lip, Palate and Alveolar (CLPA) in the Maxillofacial Surgery and Stomatology Department of the Hospital University of Treichville-Abidjan

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Abstract

Introduction: Cleft lip, palate and alveolar (CLPA) are congenital malformations of the face due to a defect in the fusion of embryonic buds during the first weeks of embryogenesis. These malformations affect the upper lip, the alveolar bone and the palate. The incidence in Africa ranges from 1/2000 to 1/500 births. Their multidisciplinary management is long and costly. Thus, the help provided by humanitarian organisations during free care campaigns is welcome. **Materials and Methods**: This is a retrospective descriptive study conducted from August 2014 to July 2016 in the Maxillofacial Surgery and Stomatology Department of the Treichville University Hospital in Abidjan, Côte d'Ivoire. The objective was to describe the epidemiological, clinical and therapeutic aspects of CLPA during a humanitarian campaign for free care. **Results**: 51 cases of CLPA were operated on. Males were involved in 54.9% of the cases, *i.e.* a sex ratio of 1.2. The average age of the patients at the time of the operation was 3.44 years with extremes of 3 months and 52 years. Patients with low socioeconomic status represented 84.3% of the cases. Cleft lips (31.4%) and cleft palates (33.33%) predominated. For cleft lips, unilateral forms were the most frequent (73.5%) and the left side was most often affected (59.2%). The most common surgical techniques used were MILLARD cheiloplasty for cleft lips (79.36%) and Dorrance pushback for cleft palates (78.05%). The postoperative course was simple in the majority of cases

(80.47%). Patients and/or parents were satisfied with the postoperative results in over 90% of cases. **Discussion**: Cleft lip and palate are common. Their management by humanitarian missions through mass campaigns allows us to receive a large number of patients affected by this pathology who are treated with a high satisfaction rate. **Conclusion**: The characteristics of cleft lip and palate in this study are in many respects identical to those described in the literature, but with some differences specific to Africa, notably the absence of antenatal diagnosis and the advanced age at the time of treatment.

Keywords

Cleft Lip and Palate, Free Care, Humanitarian Surgery

1. Introduction

Cleft lip and palate are the most common malformations of the cephalic end. They are due to a defect in fusion by mesodermisation of the nasofrontal and maxillary buds during the 2nd and 3rd months of life in utero [1]. The incidence in Africa is between 1/2000 and 1/500 births [2].

Cleft lip and palate pose aesthetic, functional, anatomical and psychosocial problems. In Africa, they are a source of rejection and fear, sometimes leading to infanticide [3].

Multidisciplinary treatment, involving paediatricians, maxillofacial surgeons, speech therapists, orthodontists, ear, nose and throat specialists and psychologists, should lead to the social reintegration of patients.

This is a long and costly process, from birth to the end of somatic growth. In developing countries such as Côte d'Ivoire, this pathology is still poorly known by the population and even by practitioners. Ignorance, combined with the low socio-economic level, the insufficient number of specialised centres and local skills, constitute an obstacle to the management of patients with CLPA [4]. Thus, the help provided by humanitarian organisations during free care campaigns is welcome. Previous studies were carried out in Abidjan on humanitarian surgery and clefts in 2009 and 2014 [3] [5]. The data remain insufficient. The studies carried out on these free campaigns in our low-income countries and populations, make it possible to update epidemiological data and evaluate cleft management strategies.

The objective of our study is to assess a free surgical treatment campaign for CLPA patients carried out in the stomatology and maxillofacial surgery department of the Treichville University Hospital in Abidjan, Côte d'Ivoire.

2. Material and Method

This is a retrospective and descriptive study carried out in the Stomatology and Maxillofacial Surgery Department of Treichville University Hospital from Au-

gust 2014 to July 2016. The study took place during a humanitarian campaign of free surgical care for CLPA conducted by two non-governmental organisations, one Ivorian, the NGO ATEF OMAIS and the other American, the NGO American Smile. The campaign consisted of three phases: a pre-operative phase, an operative phase, and a post-operative phase.

The pre-operative phase lasted two months, from August to October 2014. It consisted of patient recruitment and preparation for surgery. Patients were recruited through the press (radio, television, newspapers), with the involvement of religious denominations (announcements during worship services), charitable associations, or by telephone call of patients with CLPA followed in the department.

Patients with CLPA of any sex, aged 3 months (90 days) or older for primary cleft palates and 6 months or older for secondary cleft palates were included. Each patient was presented at a pre-anaesthetic consultation.

Patients with hyperthermia, a haemoglobin level of less than 10 mg/dl or a weight of less than 6 kg were not eligible for surgery.

These criteria allowed us to select 51 patients.

The operative phase

There were two operating teams: an American team composed of a maxillofacial surgeon and an ENT surgeon and an Ivorian team composed of maxillofacial surgeons and anaesthetists from the stomatology department of the CHU of Treichville. The American team took part in the first five days of the campaign, then the local team took over until the end of the campaign.

The postoperative phase

Post-operative monitoring was carried out at D1, D4, D8, and D12 postoperatively, then at 1 month, 3 months, and 6 months postoperatively.

The parameters studied in our work are epidemiological (age, sex, socio-economic level, the notion of CLPA in the family, etc.), clinical (type of CLPA, associated malformations), therapeutic and evolutionary.

The postoperative satisfaction criteria for CLPAs were aesthetic (alignment of the lip, cupid's bow visible, non-retractile and non-hypertrophic scar) and functional (improvement of phonation, absence of nostril passage of ingested food and liquid).

The variables were collected from medical records on a survey sheet. Data entry, tables and graphs were carried out with Microsoft Word and Excel software.

Informed consent was obtained for this study.

3. Results

3.1. Epidemiological Aspects

During the study period, 51 cases of patients with cleft lip and palate were operated on out of 76 patients seen preoperatively.

The mean age of the patients was 3.44 years with extremes of 3 months and 52 years.

The socio-demographic characteristics of the patients have been summarized in Table 1.

Table 1. Distribution of socio-demographic characteristics.

Socio-demographic characteristics		Number	Percentage (%)
Age	[0 - 3 years]	37	72.55
	[3 - 7 years]	08	15.69
	[7 - 12 years]	04	07.84
	≥12 years	02	03.92
Sex	Masculine	28	54.90
	Feminine	23	45.10
Socio-economic status	Low	43	84.31
	Medium	08	15.69
	High	00	00
Residence	Abidjan	29	57
	Province	22	43

There were no cases of consanguinity among the parents.

Three patients (05.88%) had CLPA carrier parents (one uncle and two mothers).

The average age of the mothers at delivery was 25.4 years with extremes of 18 and 42 years, and the mothers with an age between 18 and 25 years at delivery constituted the largest proportion (60.25%).

68.65% of the mothers had not performed any obstetrical ultrasound.

The discovery of CLPA was a neonatal surprise in all patients; no antenatal diagnosis of CLPA had been made.

Seniors were the population most affected by CLPA (33.65%).

Of the school-age patients, 0.77% were out of school and 4.81% had to stop their schooling at the primary level.

3.2. Clinical Aspects

Cleft lip and palate (31.4%) and velar clefts (33.33%) predominated (Table 2).

Table 2. Topographical forms of cleft lip and palate.

Denomination	Number	Percentage %
Cleft lip	10	19.6
Cleft lip and alveolar	5	9.8
Cleft lip, palate and alveolar	**16**	**31.4**
Velaeal clefts	17	33.33
Velo-palatal clefts	3	5.9
TOTAL	51	100

For cleft lips, unilateral forms were the most frequent (73.5%) and the left side was most often affected (59.2%).

We did not find any malformations associated with CLPA in our patients.

3.3. Therapeutic Aspects

The surgical procedures were performed under general anaesthesia in 97% of cases and under locoregional anaesthesia in 3% of cases.

No anaesthetic incidents were recorded.

In the majority of patients, cheiloplasty was performed according to the MILLARD technique (79.36%).

As for staphylorrhaphy, the DORRANCE pushback technique was the most used (78.05%).

3.4. Evolutionary Aspects

The postoperative course was simple in the majority of cases (80.47%).

The postoperative complications and sequelae observed were suture loosening in the secondary cleft palate (5.97%), and labial retractions and unsightly scars in the primary cleft palate (4.56%).

No deaths were reported.

Parents and/or patients were satisfied with the postoperative results in 97.12% of cases:

- Total satisfaction (73.08%).
- Mixed satisfaction (24.04%).

The surgeons were satisfied with the postoperative results in 75% of cases (Figure 1 and Figure 2).

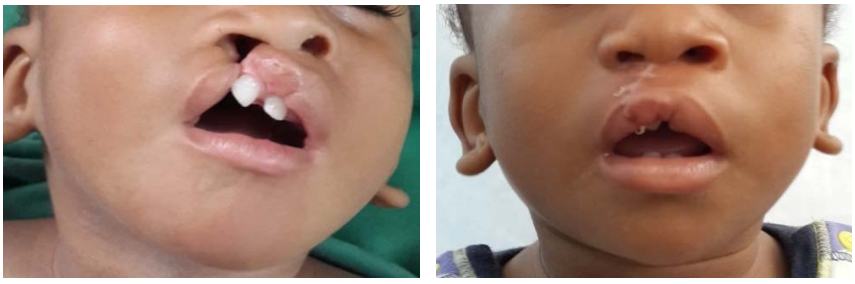

Figure 1. Right unilateral complete labio-alveolar cleft in pre and post operative.

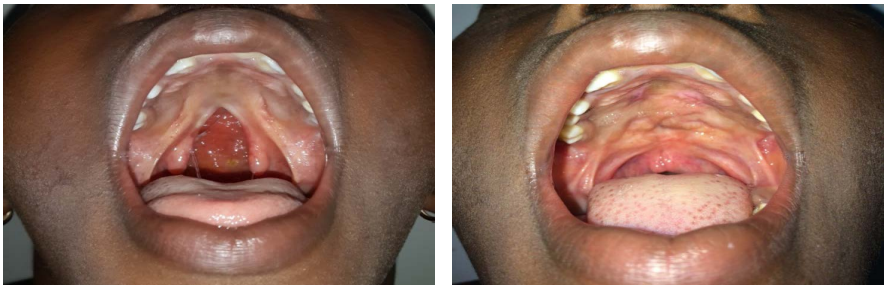

Figure 2. Incomplete velo-palatal cleft in pre and post operative.

4. Discussion

This humanitarian campaign for free treatment of CLPA allowed us to recruit a large number of patients with CLPA in a short period and to study their epidemiological, clinical, therapeutic and evolutionary characteristics.

The limits of the study lie in the number of 51 patients recorded during this campaign, which seems low for a free campaign. This is justified by:

- Insufficient information and awareness of the pathology and the treatment campaign;
- A care campaign near the most affected or exposed regions;
- Infanticide in sick patients.

The mean age of 3.44 years in our series is similar to that found in most African studies [5] [6].

This average age is higher than that found in the Western series. Indeed, in most Western studies, the age of patients is between 1 and 30 days of life for early management and between 1 and 12 months for late management of CLPA [7].

This high average age found in African series can only be justified by socio-cultural reasons: imputation of CLPA to curses and witchcraft, marginalisation of patients whose contact can "contaminate", ignorance of the pathology, ignorance of therapeutic possibilities and the lack of specialised local facilities [8] [9].

Operating CLPA in older children, adolescents and adults is an African particularity where mentalities condition the therapeutic itinerary of patients. This has an impact on the patients' school careers. Parents do not dare to enrol malformed children in school, and children who are enrolled refuse at some point to continue to go to school because of the ridicule.

In the LOROT-MARCHAND study, 50% of the patients over 12 years of age repeated the first or second year of primary school [10]. In agreement with numerous studies, our series showed a male predominance [5] [11]. Various factors are incriminated in the occurrence of clefts: genetic factors (familial forms, chromosomal abnormalities, presence of an OFCC1 gene…), external or environmental factors (low socio-economic level, geographical and ethnic origin, pollution…).

The low socio-economic standard of living found in our results is in line with WHO criteria, according to which the prevalence of cleft lip and palate is particularly high in populations with a low socio-economic standard of living. However, all social strata are affected by this condition. The absence of patients with a high socio-economic status in our study is because the parents of these patients usually have health insurance that enables them to pay for their care without waiting for free care campaigns.

The majority of our patients, with a low socio-economic level and coming from rural areas, seized the opportunity of this free care mission to have patients operated on who would probably not have been operated on any time soon. As a

result of ignorance and low socio-economic status, the majority of mothers in our series had not performed any ultrasound during the prenatal check-up and the ultrasounds performed did not reveal the malformations.

Antenatal ultrasound allows the diagnosis of CLPAs in most cases, allowing obstetricians and plastic surgeons to prepare the parents psychologically before birth. In routine practice, reference ultrasound sections should be able to detect a majority of cleft lips and cleft palates. However, cleft palates without labio-alveolar involvement remain underdiagnosed antenatally [2].

Children with cleft lip and palate may have associated malformations, which may or may not be part of a syndromic framework: skeletal, urogenital, renal, and cardiovascular malformations.

We did not find any associated malformations in our patients.

In our series, mothers aged between 18 and 25 years at delivery constituted the largest proportion.

This relatively young average maternal age at delivery in our series is consistent with that of many authors [8] [9]. Some studies, however, show that congenital anomalies increase with maternal age over 35 years [12] [13].

A family history of CLPA is a likely reflection of genetic transmission of the disease, a teratogenic factor or a risk factor to which the family is exposed. We did not find any consanguineous marriages in our series. The incidence of CLPA decreases with the relationship [14].

The risk of CLPA is increased in multiparous women with 4 or more children. In our series, elders were the population most affected by CLPA.

The preferential topography of CLPA found in our study is similar to that found in the majority of studies: cleft lip and palate and cleft lip and palate left side for cleft lip [5].

The operations were mostly performed under general anaesthesia.

Locoregional anaesthesia was performed on two adult patients aged 20 and 25 years with unilateral cleft lips. This anaesthesia technique was taught by the American team to the local Ivorian team. It is performed with a unilateral maxillary block in case of unilateral cleft lip and a bilateral maxillary block in case of bilateral cleft. It is only performed on adult patients and is beneficial to both patients and doctors.

It has many advantages, including reduced perioperative opioid consumption, early resumption of feeding, and reduced cost of surgery [15].

CLPA surgery presents significant risks of upper airway obstruction and respiratory depression, correlated with the size of the CLPA and increased by the administration of morphine, necessary for intra- and postoperative analgesia. Incidents related to anaesthesia are however rare as was the case in our study.

The chronology of the management of CLPA varies according to the teams. The main goal is to achieve the best functional, aesthetic and psychological results by taking different therapeutic paths. Some teams recommend early intervention between the ages of 1 and 6 months to rapidly restore function (ventilation, swallowing and phonation) and reduce the impact of the malformation on

the psyche of the parents and their family [16] [17]. Other teams prefer to perform the surgery at a later age, as good postoperative results in very young children can be poor as the children grow [18]. In our study, the minimum age of eligibility of patients for surgery (6 months for the primary palate and 9 months for the secondary palate) was dictated by the anaesthetic possibilities.

The choice of surgical techniques used is a textbook technique. Millard's cheiloplasty and Dorrance's push-back palatoplasty remain the most commonly used techniques [8] [19]. Few postoperative complications were found in our study by the literature [8] [20]. Some post-operative aesthetic and functional results judged satisfactory by the patients and their relatives were however considered unsatisfactory by the surgical team.

The patients were satisfied with the acceptable, and regaining a social face after a completely free treatment allowed them to reintegrate into the social fabric. The mixed satisfaction expressed by some parents and/or patients, the "it's good but…" can be explained by the fact that the feeling of guilt felt by the parents in front of the CLPA remains despite the surgical repair. This repaired face would never correspond to that of the imaginary child.

5. Conclusions

In the African context, the diagnosis and management of CLPAs remain dependent on the socio-economic level and numerous socio-cultural factors.

Although the skills and technical facilities exist for the adequate management of CLPA, a fringe of the population continues to have an erroneous conception of their aetiology wrongly attributed to mystical causes.

Early treatment allows patients to be socially integrated and puts a smile back on the face of many affected families.

The association of a local Ivorian surgical team with the team from the USA not only allowed for the sharing of expertise but also the possibility of long-term follow-up of patients after the departure of the foreign team.

Conflicts of Interest

No conflicts of interest in this article.

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