

# Komfo Anokye Teaching Hospital Multidisciplinary Cleft Clinic

*Pius Agbenorku, MD, PhD, FPCS(Plast), FICS, FWACS, FGCS,\* Samuel Ansa, BDS, † Alexander Acheampong, BDS, † Daniel Sabbah, MD, ‡ Daniel Bankas, MD, DDS, FGCS, † Emmanuel Adu, MBChB, FWACS, FGCS,\* Gyikua Plange-Rhule, MBChB, § Yaa Adiyiah, BSc, || and Peter Donkor, MDSc, FWACS, FGCS †*

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**Background:** A retrospective review of cleft lip and palate surgeries at our hospital during 2001–2005 showed an increase in patients treated per year. The aim of the study was to review the activities of the clinic, hence to determine the variation in number of cleft lip and palate cases and surgeries from 2006 to 2009, and also to identify the commonest type of cleft cases during the same period.

**Methods:** Data for this retrospective study were obtained from the outpatient department records of the cleft clinic and operating theater. Information collected included demographic features of the patients, types of cleft lip/palate, number of attendance, and surgeries performed. The data were then analyzed using SPSS version 12.0.

**Results:** A total of 528 patients were operated on for cleft lip/and palate (ie, 132 surgeries per year). Most patients (54.2%, n = 286) were boys. The age of the patients ranged from 1 to 25 months, with a mean age of 3.7 months. There was also an increase in cleft lip surgeries from 2006 to 2009, whereas cleft palate surgeries decreased toward the year 2009. In terms of types, cleft lip (73.1%, n = 386) outnumbered cleft palate. Also, unilateral clefts (70.5%, n = 372), in terms of position, were the majority.

**Conclusions:** The number of cleft surgeries was found to increase per year, and unilateral cleft lip was identified as the commonest type of cleft cases. Financial, logistic, and training support to cleft clinics in developing countries would play an essential role in the treatment of cleft patients.

**Key Words:** Cleft lip/palate, multidisciplinary cleft clinic, patient management, cleft lip/palate repair, national health insurance scheme

From the \*Reconstructive Plastic Surgery and Burns Unit, †Oral and Maxillofacial Unit, Komfo Anokye Teaching Hospital, School of Medical Sciences, Kwame Nkrumah University of Science and Technology; ‡Orthodontic Unit, Komfo Anokye Teaching Hospital; §Department of Child Health, Komfo Anokye Teaching Hospital, School of Medical Sciences, Kwame Nkrumah University of Science and Technology; and ||Nutrition Unit, Komfo Anokye Teaching Hospital, Kumasi, Ghana.

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Address correspondence and reprint requests to Dr Pius Agbenorku,

University PO Box 448, KNUST, Kumasi, Ghana;

E-mail: pimagben@yahoo.com

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The management of children with cleft lip and palate presents many challenges but also many rewards. Affected individuals present a multiplicity of problems, and effective management involves a wide range of specialists. This multidisciplinary specialist model has an international acceptance, and many centers have slowly developed their services along these lines.<sup>1</sup>

Cleft lip and/or palate (CL +/- P) is a congenital abnormality that is seen frequently worldwide. On average, about 1 in every 500 to 750 live births results in a cleft.<sup>2</sup> Furthermore, in the United States, the prevalence for CL +/- P is 2.2 to 11.7 per 10,000 births. Cleft palate alone (CPO) results in a prevalence rate of 5.5 to 6.6 per 10,000 births.<sup>3</sup> Cleft of the lip, palate, or both is one of the most common congenital abnormalities and has a birth prevalence rate ranging from 1 in 1000 to 2.69 in 1000 among different parts of the world.<sup>4</sup>

Prevalent rates reported for live births for CL +/- P and CPO vary within different ethnic groups. The highest prevalence rates for CL +/- P are reported for Native Americans (3.74/1000) and Asians (0.82/1000 to 4.04/1000). Africans (0.18/1000 to 1.67/1000) have the lowest prevalence rates. Rate of occurrence of CPO is similar for whites, Africans, North American natives, Japanese, and Chinese.<sup>4</sup>

In Malawi, there is a reported low prevalence rate for CL +/- P, 0.7 per 1000 live births.<sup>5</sup> Suleiman et al<sup>6</sup> found that the prevalence rate of clefting among a group of Sudanese hospital newborns in the city of Khartoum is 0.9 per 1000 live births. In Ghana, the only community-based study on cleft was reported by Agbenorku et al, where they reported a cleft lip/cleft palate prevalence of 5.0 per 1000 people in the Wudoaba communities in the southeastern border of Ghana.<sup>7</sup> A retrospective review of cleft lip and palate operations carried out at the Komfo Anokye Teaching Hospital (KATH) in Kumasi, Ghana, reported that a total of 344 patients were operated on for CL +/- P during the 5-year period, that is, 69 operations per year.<sup>8</sup> Most prevalence reports on CL +/- P had their data from hospitals, with relatively few studies done in communities.<sup>9</sup>

The development of the face is coordinated by complex morphogenetic events and rapid proliferative expansion and is thus highly susceptible to environmental and genetic factors, rationalizing the high incidence of facial malformations. During the first 6 to 8 weeks of pregnancy, the shape of the embryo's head is formed.<sup>10</sup>

The etiology of CL +/- P is still largely unknown. Most clefts of the lip and palate are believed to have a multifactorial etiology with several genetic and environmental factors interacting to shift the complex process of morphogenesis of the primary and secondary palates toward a threshold of abnormality at which clefting can occur.<sup>11–17</sup>

Patients with oral clefts may also exhibit other anomalies, although the published data vary significantly between studies. Recent research indicated that 21% to 37% of patients might have other anomalies including cardiovascular (24%–51%), musculoskeletal,

facial dysmorphism, or genitourinary system disturbance.<sup>18,19</sup> Children with associated anomalies are more likely to have combined cleft lip/cleft palate or cleft palate, rather than cleft lip alone.<sup>8</sup> They are often of lower birth weight.<sup>20</sup>

There are more than 400 syndromes that include CL +/- P as a component listed in the London Dysmorphology Database.<sup>21</sup> Donkor et al,<sup>8</sup> in a 5-year cleft lip and palate studies in KATH, revealed more surgeries performed for each year (ie, 69 surgeries per year) and also showed that unilateral cleft lip accounted for 78% of all cleft surgeries performed.

The purpose of this study was to review the activities of the KATH Multidisciplinary Cleft Clinic, hence to determine the variations in number of cleft lip and palate cases and surgeries from 2006 to 2009, and also to identify the commonest type of cleft cases attended to during the same period.

## MATERIALS AND METHODS

### Treatment Center

The KATH in Kumasi, Ghana, is the second largest hospital in the country and the only tertiary health institution in the middle belt of the country. It is the main referral hospital for the Ashanti, Brong Ahafo, northern, upper east, and upper west regions.

The hospital was built in 1954 as the Kumasi Central Hospital. It was later named Komfo Anokye Hospital after Okomfo Anokye, a legendary fetish priest of the Ashantis. It was converted into a teaching hospital in 1975, affiliated to the School of Medical Sciences of the Kwame Nkrumah University of Science and Technology, Kumasi. The hospital is also accredited for postgraduate training in various surgical and medical disciplines by the West African College of Surgeons, West African College of Physicians, and the Ghana College of Physicians and Surgeons. The hospital currently has 1000 beds; up from the initial 500 when first built.

The Reconstructive Plastic Surgery and Burns Unit and the Oral and Maxillofacial Unit where the cleft lip/palate surgery is performed are among the units of the Surgery Directorate and the Directorate of Dental, Eye and ENT, respectively, having the state-of-the-art equipment in KATH. The KATH Multidisciplinary Cleft Clinic was established in 2003 as collaboration between plastic and maxillofacial surgeons, pediatricians, nutritionists, orthodontist, speech and language therapist, nurses, and other supporting staffs of KATH.

### Data Collection and Analysis

Data for this retrospective study were obtained from the outpatient department records of the KATH Multidisciplinary Cleft Clinic and the operating rooms from 2006 to 2009. All patients in the study were seen at the cleft clinic, some of which had undergone the cleft repair surgery under general anesthesia. Information collected included demographic features of the patients, types of cleft lip/palate, number of cases seen, and surgeries performed. The data were then analyzed and results displayed in tables and graphs by using SPSS version 12.0 (SPSS, Inc, Chicago, IL).

### Patient Management

#### Surgery Schedule

Technically, the surgery can be performed at any time after the child is born. In general, the rule of 10 was adopted. That is, the baby was operated on at about 10 weeks old, with body weight about 10 lb, that is, 4.5 kg, and hemoglobin level of about 10.0 g/dL. The risks in general anesthesia are much reduced when these parameters are attained. At this center, cleft palates were customarily repaired at about 12 months of age.

#### Surgery for Unilateral Cleft Lip

The aim of the surgery is to repair the defect and realign the deranged muscle back to the normal anatomic position. The end result should be a lip with relatively normal look both statically and dynamically. Millard's rotation-advancement repair method was the surgical technique used in the KATH Multidisciplinary Cleft Clinic surgery protocol.

#### Surgery for Bilateral Cleft Lip

The preoperative formalities and the aim of the operation are the same as for unilateral cleft lip. The technique used was the straight-line procedure.

#### Surgery for Cleft Palate

The purpose of cleft palate operations is to produce anatomic closure and, eventually, normal speech, as well as to minimize maxillary growth retardation and dental alveolar deformity. It is important that the palatal defect be repaired before the child initially attempts to speak. The technique usually used was Langenbeck variant.

#### Role of the Pediatrician

When an affected child is born, the parents are faced with a shock. The pediatrician member of the cleft clinic is confronted with their immediate questions about what could be done. He/she could influence positively the parents' attitudes toward their child and the management of his/her problem. The knowledge, reassurance, and counseling that the pediatrician always provided at such a critical stage did much to alleviate the uncertainties and anxieties of the parents.

#### Nutrition

Most incomplete cleft lip babies do not have feeding problems with bottles. However, the negative intraoral pressure that needs to be generated for suction cannot be created in complete cleft lip babies especially in the bilateral situation. The best and economical way that this problem was dealt with was to use squeezable plastic milk bottles with enlarged tit hole. The cleft babies also needed to be fed by spoon or syringe. This was to make sure the baby learned these 2 other ways of feeding. Bottle-feeding was not allowed in the immediate postoperative period.

#### Orthodontics

Dental problems associated with cleft lip involve irregularity in the area of the cleft such as supernumerary incisors, rotation, and malformation of the lateral incisors and malocclusion. Orthodontic treatment (alignment of the teeth and their underlying supporting structures) was used to intervene at almost any age from birth to teenage years. Treatment was limited to discrete episode of treatment that contributed to the end result, for example, presurgical dentofacial orthopedics—use of a dental plate to align the maxillary segments before initial lip and palate repair.

#### Speech and Language Therapy

Children born with palate cleft are at risk for developing abnormal speech patterns. Hall<sup>21</sup> stated that 80% of nonsyndrome cleft children who had palate repair before 18 months of age did not require speech and language therapy.

The etiology of speech disorder is often multifactorial and complex in nature with many structural and nonstructural factors potentially interacting to cause speech problems. Etiologic factors include abnormal oronasal structure and/or function, for example, velopharyngeal insufficiency; nasal airway deviations; hearing and ENT problems; residual clefts and oronasal fistulae; abnormal oronasal structure and growth, for example, dental and occlusal



FIGURE 1. Sex distribution of the patients operated on (n = 528).

anomalies; and abnormal neuromotor development, for example, abnormally learned neuromotor patterns, developmental learning deficits, and neurologic factors. Speech and language therapy is required to remediate the resulting speech disorder rather than further surgery.

**Postoperative Management**

The patient was propped up to 30 degrees to reduce venous congestion and edema. Both upper limbs were restrained to prevent disturbance to the wound. Systemic antibiotic was administered. The wound was exposed and applied with chloramphenicol ointment 3 times daily (not for patient with glucose-6-phosphate dehydrogenase deficiency). The intravenous infusion was continued until the patient took enough milk by spoon or syringe orally. For bilateral cleft lip (especially complete type), it was mandatory for the attending nurse to apply suction regularly to clear the fluid in the nasal catheter.

**Follow-Up**

The patients were usually admitted to the ward after surgery for 3 to 5 days. On discharge home, they were seen at the outpatient department of KATH Multidisciplinary Cleft Clinic at 1 week and thereafter at 3 weeks. The parents were taught how to massage the scar to hasten scar maturity and prevent scar contracture formation. The patients were followed up 4 monthly for the first year. Thereafter, the patients would be seen every year until around the age of 20 years, when all postcleft lip-nose refinement surgeries are completed.

**RESULTS**

**Demographic Characteristics of Patients**

A total of 528 patients were operated on for cleft lip/palate during the 4-year period under review. Most patients (54.2%, n = 286) were boys, whereas 45.8% (n = 242) were girls (Fig. 1). The age of the patients ranged from 1 to 25 months, with a mean age of 3.7 months (Fig. 2).

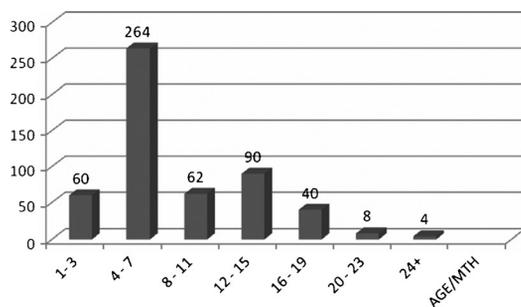


FIGURE 2. Age distribution of the patients operated on (n = 528).

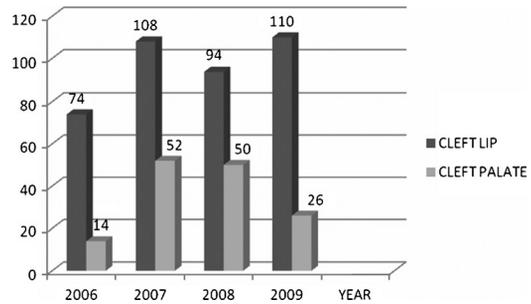


FIGURE 3. Distribution of cleft lip/palate surgeries for 2006-2009 (n = 528).

**Distribution and Types of Operated Cleft Lip/Palate**

Of the total (n = 528) cleft surgeries performed, the year 2007 recorded the highest (30.3%, n = 160), followed by 2008 (27.3%, n = 144) and 2009 (25.8%, n = 136) (Figs. 3 and 4). There was also an increase in cleft lip surgeries from 2006 to 2009, whereas cleft palate decreased toward the year 2009 (Fig. 5). In terms of types, cleft lip (73.1%, n = 386) outnumbered cleft palate. Also, unilateral clefts (70.5%, n = 372), in terms of position, were the majority (Table 1).

**Number of Cleft Lip/Palate Attendance for Each Year**

Patients' attendance to the cleft clinic had been increasing in the years under review, from 476 in 2006 to 893 in 2009 (Fig. 6).

**DISCUSSION**

The results of our study showed that most of the cleft patients were boys. This had been reported by Donkor et al<sup>8</sup> in a similar study at KATH. Other studies in different countries had also reported similar results, where male outnumbered female cleft lip/cleft palate patients.<sup>22-24</sup> However, few studies in Africa had reported girls to be dominant.<sup>5,6</sup> Comparing the results indicates that boys still dominate cleft lip and cleft palate cases in KATH, irrespective of ethnic background.

Few prevalence studies discriminate between unilateral and bilateral cleft lip and palate, although a prevalence ratio of 4:1 has been reported in 1988 by Jensen et al.<sup>24</sup> Other studies such as that of Moller,<sup>25</sup> Hixon,<sup>26</sup> and Ivy<sup>27</sup> have shown that unilateral cleft lips are far more common than bilateral clefts, accounting for 85% of the cleft lip and 80% of cleft palate. In Ghana, a retrospective study in KATH had also revealed that 78% of surgeries performed on 344 cleft patients were unilateral cleft lip alone.<sup>8</sup> In our study, unilateral cleft lip/cleft palate constituted 70.5% of the total cases, whereas unilateral cleft lip alone accounted for 45.8%. However, cleft palate

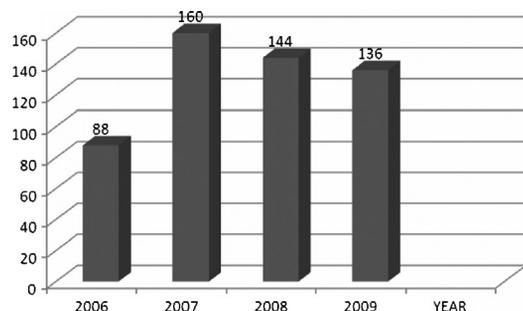
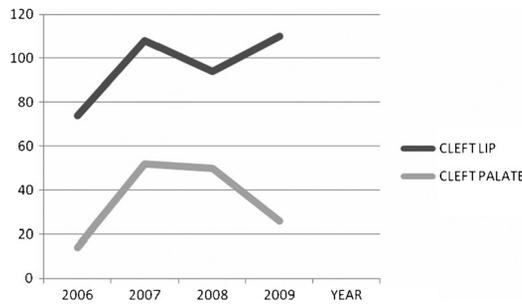
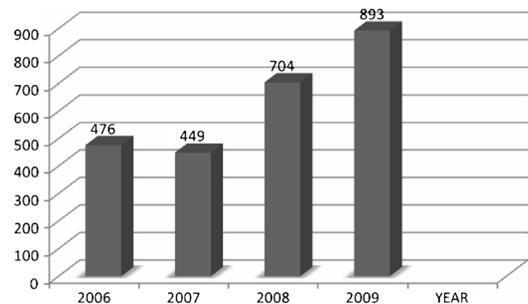


FIGURE 4. Total number of cleft surgeries performed for the 4 years (n = 528).



**FIGURE 5.** Trend of cleft lip/palate from 2006 to 2009 (n = 528).



**FIGURE 6.** Distribution of patients attending the KATH Multidisciplinary Cleft Clinic, 2006–2009 (n = 2522).

surgery has decreased, during the period under review. This reduction in number of cleft palate surgeries may be due to underdiagnosis in communities such as ours with poorly developed medical services, because a majority of the patients had been referred to the cleft clinic from other hospitals and health centers. Other factors may include the unavailability of experienced anesthetists to intubate the cleft palate patients for the necessary surgery to be performed and reluctance of patients with combined cleft lip and palate to return for palatal surgery once the lip has been repaired. More patient education is required to reverse this tendency. A more comprehensive and prospective study is required to provide more accurate epidemiological information on clefts in our community.

There had been a higher incidence of congenital cleft abnormalities repairs during the period under review (ie, 132 surgeries per year). The study of Donkor et al<sup>8</sup> at the same hospital (KATH) recorded 69 cleft surgeries per year. Again, Donkor et al<sup>8</sup> reported that financial barrier is a factor for the low patronage of cleft abnormality repairs in KATH. However, this factor had been solved by the introduction of the National Health Insurance Scheme by the Ghana Government, hence may be a contributing factor for the increase in cleft lip and cleft palate surgeries. Other factors for the upshot in cleft repair surgeries may be due to the greater awareness in the community, increase in the number of cleft surgeons in KATH (from 3 to 4 presently), free surgeries provided by the cleft surgery team with financial assistance from a United States–based nongovernmental organization (Smile Train), and free surgeries by visiting surgical teams within the framework of the KATH Multidisciplinary Cleft Clinic.

Another important factor to be considered was the educational benefit derived by the KATH Multidisciplinary Cleft Clinic staff and the community as a whole. Local doctors developed the experience and got well informed to perform complicated surgeries with the limited resources at their disposal, after working alongside foreign counterparts from sophisticated and modernized surgical techniques' backgrounds for the past years. Other local health personnel such as anesthetists are now in the capacity to handle more complicated surgeries on their own, which formerly were big challenges to them. Because of the efficiency of the KATH Multidisciplinary

Cleft Clinic along the years, many cleft patients and their relatives had joyful smiles on their faces after successful surgical procedures for the repair of their respective cleft deformities. The various communities where these patients lived had the share of the educational benefit, because the people are now informed that cleft deformities could be repaired and people born with these deformities were not cursed or possessed by evil spirits as they formerly believed.<sup>7</sup>

Our study reveals that the attending number of patients to the cleft clinic increased every year. However, comparing the number of surgeries performed on cleft patients to the number of attendance reveals a vast difference in terms of numbers (clinic attendance far outnumbered the number of operations). This is so because attendance mostly included review of old operated cases and those yet to be operated on, because of differences in age, weight, and hemoglobin levels of the patients.

## CONCLUSIONS

Cleft lip/palate repair is one of the most satisfying surgical procedures for a surgeon. A well-repaired cleft lip or cleft palate can bring great joy to the parents and a bright future for the child. The number of cleft surgeries was found to increase per year, and unilateral cleft lip was identified as the commonest type of cleft cases. Financial, logistic, and training support to cleft clinics in developing countries may go a long way to help bring a smile on the face of affected individuals.

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**TABLE 1.** Classification of Types of Clefts Operated on (n = 528)

Cleft	n	Occurrence		Position	
		Complete	Incomplete	Unilateral	Bilateral
Cleft lip	386	248	138	242	144
Cleft palate	142	18	124	130	12

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