

Analysis of Clinical Features and Associated Malformations in Our Patients with Cleft Lip and Palate Anomaly

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Abstract

Cleft lip and palate anomaly is one of the common anomalies of the head and neck region. The mean incidence is considered to be 1.3 - 1.7/1000 that varies from region to region. Interaction of many genetic and environmental factors is thought to be the reason.

Material and Method: Newborns with cleft lip and palate anomalies in our hospital between 1 January 2007 and February 2017 were evaluated retrospectively in this study. The data of the patients was obtained from the discharge report. Prenatal history, maternal age, maternal risk factors, type of delivery, gestational week, gender, clinical findings and additional malformations observed in infants with cleft lip and palate were recorded in detail from the files.

Results: A total of 12 of 10880 deliveries (0.1%) were found to have cleft lip and palate anomalies between 1 January 2007 and February 2017 in our hospital. Nine of them were male (75%) and 3 (25%) were female. Nine of them had cleft palate and 3 of them had cleft lip and palate. The mean birth weight of the cases was 3352 ± 487.9 gr (2600 - 4200 gr) and the duration of the hospitalization was 6.7 ± 2.1 days (1 - 24). The mean maternal age was 26.9 ± 7 years (21 - 39), 2 mothers had hypothyroidism and 1 mother had flu-like infections plus gestational diabetes in medical history. Pierre Robin syndrome in 2 cases, micrognathia in 1 case and Apert syndrome in 1 case were detected during the investigation of associated malformations. Congenital heart disease was detected in 5 cases. ASD in 2 cases, pulmonary stenosis + VSD in 1 case, pulmonary atresia + VSD in 1 case and PDA (up to close) + PFO in 1 case were detected.

Conclusion: The majority of the cases are thought to be the result of mutual effects of genetic and environmental factors. This study showed that vitamin D deficiency may be cause in one of our cases. No report was found in the literature about hypothyroidism. but it's needed more investigation.

Keywords: Cleft Palate; Cleft Lip; Newborn; Malformation

Introduction

Cleft palate cleft lip anomaly is one of the common anomalies of the head and neck region. It is caused by the inadequate convergence of embryonic extensions that forms the soft tissue and bone tissues of the upper jaw and oral palate [1]. The average incidence is 1.3 - 1.7/1000 with showing regional variability [2,3].

Cleft lip/palate anomalies can be isolated, but can also be observed with chromosomal and structural abnormalities, and be seen approximately with 350 syndromes [4]. Many environmental and genetic factors have claimed to be involved in etiology. Our aim in this study, is to determine the rate of infants born in our hospital with cleft lip and palate and evaluate the incidence, clinical features, and additional anomalies within ten years of period.

Materials and Methods

In the study, newborn infants with cleft palate and cleft lip anomalies between January 1, 2007 and February 2017 were studied retrospectively. During the study, the principles set out in the Helsinki Agreement, adopted in 1975 were followed, and the families were informed, accordingly. Patient data was retrieved from the epicrisis. Prenatal history, maternal age, maternal risk factors, type of delivery, gestational week, gender, clinical findings, and additional malformations observed in infants with cleft palate-lip anomalies were recorded in detail from their files. Laboratory and genetic test results, orthodontics, plastic surgery, ear-nose-throat consultation results and imaging methods were evaluated. Echocardiography (ECG) and cranial + abdominal ultrasonography (USG) were performed in all cases.

Results

Between January 1, 2007 and February 2017, 10880 deliveries were performed in our hospital and 12 of them had cleft lip/palate anomalies. The incidence was found as 1.1/1000. All of the cleft lip cases were bilateral. None of them had prenatal diagnosis.

Nine of the cases were male (75%) and 3 of them (25%) were female. Nine had cleft palate, and 3 had cleft lip/palate. 10 of the cases were term, 2 were preterm, 8 were cesarean, and 4 were born with normal spontaneous delivery, mean birth weight was 3352 ± 487.9 gr (2600 - 4200 gr) and the average length of hospital stay was 6.7 ± 2.1 days (1 - 24) (Table 1). Average maternal age was 26.9 ± 7 years (21 - 39), and 2 of the mothers had hypothyroidism, and 1 mother had flu-like infection + gestational diabetes history. No drug use or smoking present during pregnancies. Cleft palate diagnosis were found in the relatives of our 2 cases.

Cases	Birth Weight	Delivery Method	Gestational-Week	Female/Male	Admission Diagnosis	Anomalies	Oxygen Need	Additional Malformations
1	3050	NSD	Term	Male	TTN	Cleft palate	O ₂ with Hood	No
2	3660	C/S	Term	Male	TTN	Cleft palate	Ventilator	Apert syndrome
3	4000	C/S	Term	Male	TTN	Cleft lip and palate	Hood ile O ₂	No
4	3560	C/S	Term	Female	TTN	Cleft lip and palate	Hood ile O ₂	No
5	3040	C/S	Term	Male	TTN	Cleft lip and palate	O ₂ with Hood	Pulmoner stenosis+VSD
6	4200	C/S	Term	Male	TTN	Cleft palate	Ventilator	Pierre Robin syndrome
7	2610	C/S	35 week	Male	TTN+convulsion	Cleft palate	Ventilator	ASD+Pierre Robin syndrome
8	3515	NSpD	Term	Male	TTN	Cleft palate	O ₂ with Hood	ASD+Pes ekinovarus
9	2610	C/S	34 week	Female	TTN	Cleft palate	Ventilator	No
10	3000	NSpD	37 week	Male	TTN	Cleft palate	Via Newborn incubator	Pulmonary atresia +VSD
11	3250	NSpD	Term	Female	TTN	Cleft palate	O ₂ with Hood	Closed PDA+PFO
12	3740	C/S	Term	Male	TTN	Cleft palate	O ₂ with Hood	Micrognathia

Table 1: Clinical features of cases.

C/S: Cesarean; NSpD: Normal Spontan Delivery; TTN: Transient Tachypnea of the Newborn; ASD: Atrial Septal Defect; VSD: Ventricular Septal Defect; PDA: Patent Ductus Arteriosus; PFO: Patent Foramen Ovale

When accompanied malformations were investigated, Pierre Robin syndrome was detected in 2 cases, micrognathia was detected in 1 case and Apert syndrome was detected in 1 case. Apert syndrome was accompanied by hydrocephalus and undescended testicle. Congenital heart diseases were detected in five cases. These were; atrial septal defect (ASD) in 2 cases, pulmonary stenosis + ventricular septal defect (VSD) in 1 case, pulmonary atresia + VSD in 1 case, and patent ductus arteriosus (PDA) + patent foramen ovale (PFO) in 1 case, respectively. One of the patients diagnosed with pulmonary atresia + VSD, prostaglandin E1 (PGE1) was started and transferred to an advanced center for operation, however the patient died after surgery. In one of our cases, unilateral pes equinovarus was diagnosed and recovered with conservative treatment. Short-term convulsions occurred in one of the infants, with 35-weeks delivery and born with cord entanglement, and controlled with phenobarbital. ASD ± oligohydramnios history was present in one of the cases.

In one of the cases, whose mother had a gestational diabetes and flu-like infection history, multiple cholesterol crystals were detected in the gallbladder by using abdominal USG, and ASD detected by using ECO. Vitamin D deficiency was also detected in this patient.

Two Pierre Robin syndrome cases were monitored with nasal CPAP due to breathing difficulties (5 - 7 days) and 1 Apert syndrome case was intubated and followed up on the ventilator (3 days). All cases were transferred to plastic surgery, genetics, otorhinolaryngologist and orthodontist. Our cases with cleft palate were fed with special apparatus made by orthodontists until surgical treatment (Figures 1 and 2). Our cleft lip cases were operated in the third month and the cleft palate cases were operated after 12 months.



Figure 1: Our first patient with cleft palate.



Figure 2: The apparatus of our first patient which was made by orthodontists.

Discussion

During the embryonic developmental stage, from the 4th week to the 10th week, a complicated coordination of cell migration, growth and apoptosis in lip and palate development are needed. Any type of interruption on this stage causes the cleft palate and cleft lip formation. During the 6th week of the intrauterine stage, the palate development begins and continues until the 12th week. In the palate formation, end of the 6th week and the beginning of the 9th week are particularly important [5]. Developmental factors causing cleft lip anomalies emerged in the gestational stages of week 4th - 7th [1,6].

In Turkey, the incidence of cleft lip/palate is 0.95/1000 and the incidence of isolated cleft palate is reported as 0.77/1000 [7]. It is twice frequently observed in men [1]. In our study, we found that the incidence was 1.1/1000 as compatible with the literature and 75% in male cases, which is higher than the literature in terms of gender 9 had cleft palate, and 3 had cleft lip/palate.

The majority of the cases are thought to be the result of mutual effects of genetic and environmental factors [1,8]. Possible etiologic factors considered include; maternal use of medication such as steroids, aminopterin, anticonvulsants, alcohol consumption, smoking, exposure to radiation during pregnancy, exposure to teratogenic substances, oligohydramnios, advanced age pregnancy, consanguineous marriages, and diseases during pregnancy (viral diseases or toxoplasmosis accompanied with fever, and rubella infections). Group B and vitamin A deficiencies are also blamed. Group B vitamin deficiencies were detected in 25% of deformed infants' mothers [1]. The average length of hospital stay was 6.7 ± 2.1 days (1 - 24) and maternal age was 26.9 ± 7 years (21 - 39), and 2 mothers had hypothyroidism, 1 case had oligohydramnios, 1 mother had flu-like infectious disease and gestational diabetes. No drug use or smoking present during pregnancies. We have detected vitamin D deficiency in one of our cases. No report was found in the literature about hypothyroidism. The mean age of the mother was 25.8 (+6) and the length of hospital stay was 6.3 (+4.3) days in the

Study with 19 volunteers conducted by Yiğit and his colleagues. In the same study, oligohydramnios was detected in one case [8]. The risk of cleft lip and palate deformity has increased in the second child of parents who previously had children with cleft lip and palate. The risk of cleft palate cleft lip for second child is 4%, and the risk of observing only cleft palate is %2 [1,9]. Cleft palate was diagnosed in the relatives of our two cases.

Cleft palate cleft lip is often accompanied by other congenital anomalies. The incidence rate of this group accompanied with congenital anomalies has been reported in the literature between 1,5% and 63,4% [10]. Treacher Collins, Stickler syndromes, and Pierre Robin anomaly accompanied with trisomies were also associated with cleft palate cleft lip deformities [1,8]. Apart from these, anomalies in many systems as neurological, cardiac, ear, skeletal, and respiratory tract can be observed [10,11]. In 178 (15.69%) of 1134 case studies conducted by Çalış and his colleagues, cardiac anomaly was detected and the most common anomaly was detected as ASD 47.8% [11]. Similar to literature, we found congenital anomalies in 8 cases (66.6%). When accompanying malformations were investigated, Pierre Robin syndrome in 2 cardiac cases, micrognathia in 1 case, and Apert syndrome in 1 case, and pes equinovarus in 1 case were detected. Hydrocephalus and undescended testicle were also accompanied by Apert syndrome. Congenital heart diseases were detected in five cases (%41.6). These were; ASD in 2 cases (40%), pulmonary stenosis + VSD in 1 case, pulmonary atresia + VSD in 1 case and PDA + PFO in 1 case, respectively. The patient diagnosed with pulmonary atresia + VSD, prostaglandin E1 (PGE1) was started and transferred to an advanced center for operation, however the patient died after surgery.

The diagnosis can be done during 13 - 14th weeks of gestation [12]. With the recent technical advancements, prenatal diagnosis rate has been increased with the use of three and four dimensional USG. Johnson and his colleagues showed that the diagnosis ratio increased from 48% to 76% with the use of three-dimensional USG [13]. Prenatal diagnosis is helpful for searching for accompanied anomalies, and genetic examination allows to intervene in the respiratory problems that may occur during childbirth. In addition, prenatal diagnosis will help to the psychological preparation and acceptance of the family. None of our cases had prenatal diagnosis. Especially, postnatal psychology of mothers was negatively affected.

The most serious problems with cleft palate are difficulty in feeding, food aspiration, increase in the frequency of otitis media and related hearing loss, and speech difficulty. Surgical intervention is recommended in lip repair for 3 months, and 12 - 18 months in palate repair to prevent jaw development.

The purpose of the treatment of cleft palate anomalies are; anatomical and functional improvement of anatomy, to maintain normal speech, hearing, face and tooth development ,and to support psychosocial development. The patient should be followed by a multidisciplinary team composed of the plastic surgeon, pediatrician, geneticist, dentist, orthodontist, otolaryngologist and speech therapist [14]. We have also referred all our cases to dental orthodontists and related specialists, including geneticists. Those with additional cardiac defects were followed by a pediatric cardiologist. The infants with cleft palate cleft lip anomaly has increased the incidence of otitis media and hearing loss may be observed. Therefore a hearing test should be performed intermittently. Our 2 cases diagnosed with Pierre Robin syndrome frequently had respiratory tract infection during 2 years after discharge. Body weight gain was lower. None of our cases had hearing loss or otitis. One of our cases applied to our emergency polyclinic by aspirating the apparatus prepared by orthodontist. The apparatus was removed and new apparatus was made.

Conclusion

As a result cleft lip/palate anomalies cause significant medical and psychological problems for both the family and the child. Therefore, a detailed systematic examination of patients with cleft lip/palate anomalies should be performed by a special team, and accompanied anomalies should be investigated. Genetic counselling must be given to the families. Patients should be followed up periodically by the same team until the adult age, even if they do not have complaints. The majority of the cases are thought to be the result of mutual effects of genetic and environmental factors. This study showed that vitamin D deficiency may be cause in one of our cases. No report was found in the literature about hypothyroidism. but it's needed more investigation.

Financial Disclosure

The authors declare that they have no financial disclosure.

Conflict of Interest

The authors declare that they have no conflict of interest.

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