

## CLINICAL STUDY

## New trends in the complex treatment in the Cleft Centre in Bratislava

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### Abstract

The last decade of the second millenium has brought some major changes into the concept of comprehensive treatment of the cleft lip and palate patients commonly accepted by the cleft center in Bratislava. Important events occurred, which surely had and in future they probably still would have an important impact on the comprehensive medical care of children with cleft lip and palate. There is beyond any doubt that an ongoing application of new trends in such fields as plastic surgery, anesthesiology, maxillofacial surgery, orthodontics, phonetics, speech therapy, paediatrics, human genetics or teratology will contribute to the progress and improvement of functional and aesthetic results and to better social adaptation of the cleft lip and palate patients.

The study focuses on the following issues: cleft incidence, timing of the primary surgical repair, as well as the need of secondary operations (closures of communications, bone grafts, pharyngeal flaps, corrections of the lip and nose) and the achieved standard of speech quality and articulation, as well as on the early and late otological states and phonation. (Tab. 7, Fig. 3, Ref. 8.)

**Key words:** cleft lip and palate, incidence, lip repair, palatal closure.

In Slovakia, the incidence of the cleft lip and/or palate is 1 out of 600–660 births, which is little higher than the European average (1 out of 700–750 births). According to the epidemiological statistics, the occurrence of the cleft lip and/or palate in Slovakia takes the 9th place among all congenital developmental anomalies.

### Material and methods

During the last 10 years, about 680 new cases of cleft lip and/or palate have been registered and treated in the National Cleft Center in Bratislava (Tab. 1, Fig. 1). Out of 680 children (Tab. 2, Fig. 2) there were 378 males (55.2 %) and 302 females (44.8 %). Pursuant to our surgical protocol, we prefer a 2-stage closure of the cleft lip and palate. At the first stage of lip reconstruction we normally use the Millard's technique in the unilateral (Millard, 1958) and the Black's technique in the bilateral cleft lip (Black, 1984). Both techniques allow an exact reconstruction of the depressed nasal wing base, functional adaptation of the orbicularis oris muscle, and they also bring about an adequate aesthetic result. During the second stage (after 6 months), we continue with the palatal closure using the Wardill-Kilner's technique, which allows an adequate elongation of the soft palate necessary for good speech quality and articulation (Wardill, 1937). During the prepa-

ration of the palatal mucoperiosteal flap, we fracture the hamulus pterygoideus bilaterally. In cases of wide cleft palate we prefer the Demjen's modification of the Wardill-Kilner's technique (Demjén, 1979), cutting the major palatal artery. A disruption of the major palatal artery allows sufficient mobilization of the palatal mucoperiosteum medially, so we are also able to close the wide palatal gap without any tension which could cause the palatal dehiscence or fistulation, respectively.

The current comparative long-term follow-ups focused on the evaluation of the achieved standard of speech quality and articulation support the idea of early surgical velopharyngeal reconstruction and palatal closure, prior to the first year of age of the patient. If there are any affiliate diseases or complications, which could delay the scheduled operation, our center performs the lip closure at the age of 3 months and the palatal closure at the age of 9 months, subject to an adequate orthodontic preparation.

About one half (46.4 %) of all cases of clefts of the primary palate require a bone graft for the fulfillment of the gap in the dentoalveolar arch. The iliac crest represents the donor site for the bone graft. The

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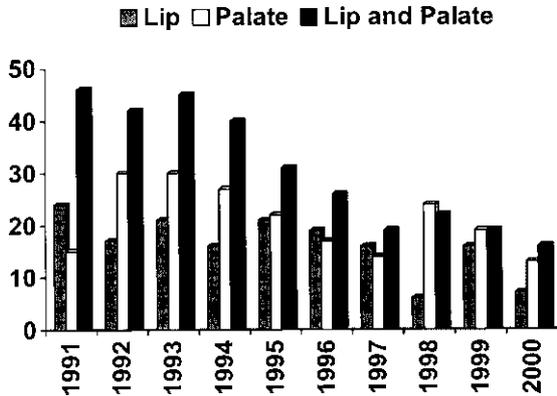


Fig. 1. Cleft type distribution in the period 1990—2000.

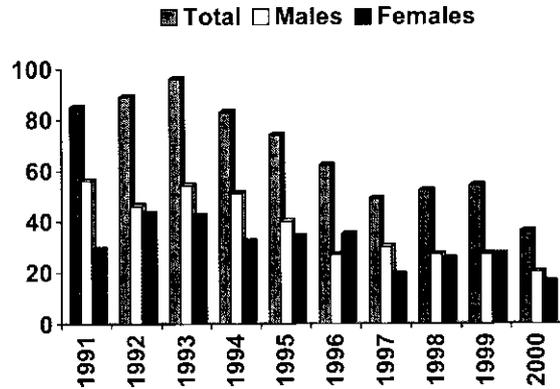


Fig. 2. Total number of new cases according to sex ratio.

timing of the operation coincides with the eruption of the definitive canine. For the speech quality and articulation improvement, we indicate the superiorly based pharyngeal flap using the Hönig's technique (Hönig 1968). In our view, the optimal timing for the pharyngeal flap is the pre-school age, at which the functional result of operation can help in the process of children's adaptation to the group (Fedeleš, 1997). The timing of the secondary correction of the lip and soft nose is determined by analogy. Definitive corrections of the nasal skeleton and nasal septum are performed upon completion of the osteogeneo-us development of the face (Tab. 3).

Tab. 1. Overview of the new cases and the total number of operations in the period 1991—2000.

New cases			
Lip	163	23.9 %	
Palate	211	31.1 %	
Lip and palate	306	45.0 %	
Number of primary operations			
Lip	469		
Palate	516		

Tab. 2. Total number of new cases according to the cleft type and sex ratio percentage in the period 1991—2000.

Year	Lip	Palate	Lip and palate	Total	Males	Females
1991	24	15	46	85	56 (66.0%)	29 (34.0%)
1992	17	30	42	89	46 (52.0%)	43 (48.0%)
1993	21	30	45	96	54 (56.2%)	42 (43.8%)
1994	16	27	40	83	51 (61.4%)	32 (38.6%)
1995	21	22	31	74	40 (54.0%)	34 (46.0%)
1996	19	17	26	62	27 (43.5%)	35 (56.5%)
1997	16	14	19	49	30 (61.2%)	19 (38.8%)
1998	62	42	25	22	7 (51.9%)	25 (48.1%)
1999	16	19	19	54	27 (50.0%)	27 (50.0%)
2000	7	13	16	36	20 (55.5%)	16 (44.5%)

Results

During the period between 1991 and 2000 2700 cleft operations (Tab. 4) were performed in our department. In the average, this means about 270 primary cleft repairs and secondary corrections per year (Tab. 5). The average age of patients with cleft lip repair (Tab. 6) was about 5.8 months (ranging between 2 and 36 months). Due to a specific indication for the closure of the submucous forms of the cleft palat-

Tab. 3. Concept of the cleft lip and/or palate operative treatment in the Cleft Center in Bratislava.

Unilateral cleft lip	
timing	3-6 months
technique	Milliard's technique
Bilateral cleft lip	
timing	3-6 months
technique	Black's, Milliard's technique
Cleft palate	
timing	6-12 months
technique	V-Y, W-Y Wardill-Kilner's technique
Primary correction of the nose deformity	
timing	3-6 months
technique	creation of the nasal base, nasal wing reposition
Secondary correction of the soft nose deformity	
timing	5-6 years
technique	different
Septoplasty	
timing	upon 15 years
technique	different
Secondary lip correction	
timing	5-6 years
technique	different
Pharyngeal flap	
timing	5-6 years
technique	Hönig's technique of superiorly based flap
Dentoalveolar bone graft	
timing	7-10 years
technique	iliac crest

te, the average age of patients with cleft palate repair was about 12.9 months (range between 4 months and 14 years).

The clinical analysis of secondary corrections implies that the need for lip correction was in 18.2 % of patients, for corrective rhinoplasty in 22.3 %, for septorhinoplasty in 9 % and for pharyngeal flap in 10.1 % of patients. The occurrence of the vestibulonasal and oronasal communications was in 23.2 % of patients. The average age for bone grafting was 14 years.

As to the phoniatric and speech therapy, there is a need for an early assessment of the achieved standard of speech quality and otological failures. Our efforts aiming towards the continuous therapy of speech and hearing failures is most intensive between the age of 3 to 6. This is due to the need of maximum improvement in articulation at the pre-school age. Psychological investigation is indicated for the understanding of the reasons of failures in speech intelligibility and unimproved articulation. Out of all 43 outpatients followed by speech therapist in 1995, normal hearing occurred in 63 % of cases. A mild conductive hearing loss was diagnosed in 37 % of patients. An adequate speech resonance was diagnosed in 59 % of cases, mild hypernasality in 25 % and moderate hypernasality in 16 % of patients. Normal speech intelligibility occurred in 70 % of patients, while backward shift of the articulation base was diagnosed in 27 % (Tab. 7).

## Discussion

At present there are numerous concepts of comprehensive treatment of cleft anomalies. The comparison between the individual

concepts is very difficult due to the specific nature of the treatment as such and due to incompatible documentation. Only optimal coordination, reciprocal cooperation and flexibility of each center could contribute towards achieving an “ideal therapeutic concept” in the future. With this aim, the Intentional Project Eurocleft was founded. At its I. Congress in Manchester in 1998 the standards of comprehensive care for cleft lip and palate children in Europe were defined. The aim of the Eurocleft project is to coordinate, monitor and evaluate prospectively the results from associated centers. Because of the specific nature of cleft issues, the final conclusions cannot be made soon than in a couple of years. However, a lot of current multicentric comparative studies based on the principles defined by Eurocleft are underway.

The tendency to perform the primary cleft operations as soon as possible (i.e. to close the cleft completely prior to the age of 1), is worldwide. In animal experiments there were some intrauterine cleft closures done with encouraging functional and aesthetic results.

The second phenomenon is a tendency for the “one-stage” closure of the cleft lip and palate, in other words all in one single operation. The main advantage of this concept is the omission of at least one anesthesia and hospitalization, with consequential minimalization of potential undesirable impacts and less stress for the kid and for the parents. An operation in unscarred tissue and an early reconstruction of the muscular system in soft palate lead to better speech and hearing development and prevent the potential dislocation of maxillary segments. Also from the economic point of

**Tab. 4. Total number of operations according to their character in the period 1991–2000.**

Year	Lip	Palate	Bone graft	Pharyngeal flap	Others	Total
1991	70	60	2	5	146	283
1992	59	70	10	12	174	325
1993	66	78	20	8	154	326
1994	56	65	31	4	191	347
1995	52	63	22	17	183	337
1996	45	50	16	7	162	280
1997	35	34	12	5	130	216
1998	28	41	9	5	126	209
1999	35	31	7	3	100	176
2000	23	24	13	6	140	206

**Tab. 5. Total number of secondary operations according to their character in the period 1991–2000.**

Year	Fistulas	Lip	Nose	Septum	Others
1991	66	27	46	4	3
1992	47	58	57	4	8
1993	58	41	46	6	3
1994	60	56	53	9	13
1995	60	49	52	11	11
1996	37	50	57	7	11
1997	15	46	56	5	8
1998	32	41	41	5	7
1999	34	26	32	7	1
2000	23	51	40	14	12

**Tab. 6. Age average at the primary repair in the period 1991–2000.**

Years	Lip closure	Palatal closure
1991	8,2m (3m-36m)	14,2m (7m-36m)
1992	7,6m (3m-36m)	15,6m (6m-36m)
1993	6,7m (3m-18m)	12,4m (4m-35m)
1994	6,2m (3m-21m)	13,2m (5m-36m)
1995	5,5m (3m-20m)	12,3m (5m-36m)
1996	4,8m (2m-20m)	12,0m (4m-40m)
1997	5,3m (2m-24m)	14,5m (4m-14y)
1998	4,3m (2m-10m)	10,3m (4m-5y)
1999	4,9m (3m-11m)	14,3m (4m-8y)
2000	4,4m (2m-9m)	9,9m (5m-24m)

m – months, y – years

**Tab. 7. Functional results in the Cleft Center. Examined 43 patients in phoniatric care.**

Speech intelligibility	
good	70%
worse	30%
Articulation	
base shifted backwards	27%
Resonance	
adequate	59%
mild hypernasality	25%
moderate hypernasality	16%
Hearing	
normal	63%
mild conductive loss	37%
perceptive loss	0%



**Fig. 3. Functional and aesthetic results.**

view, the concept helps in costs reduction (Honigmann, 1996). Some authors have more than 10 years of experience with this technique and it is a matter of several years to be able to present their results in patients with completed osteogeneous facial development.

In 1999 we performed the “one-stage” closure of the complete cleft lip and palate for the first time. In a single operation we performed the palatal closure, bone graft into the dentoalveolar arch and lip closure. Because of a small number of patients operated with this technique, the results are statistically not yet significant.

During the last decade we have recorded in our clinical material a decreasing number of new cases of cleft lip and/or palate patients. In our view, one of the reason lies in a reducing number of in our country. Also, the progress in prenatal diagnostics and human genetics has brought about a reduced occurrence of severe forms of cleft anomalies.

The treatment of the cleft lip and palate has to be comprehensive. Therefore, there is a global tendency for the medical care to concentrate into cleft centers, where special interdisciplinary teams comprising experts from such fields as plastic surgery, anesthesiology, maxillofacial surgery, orthodontics, phonetics, speech therapy, paediatrics, human genetics or teratology, have been established (Janovič, 1997). Only with this approach can our efforts bring expected results compliant with severe international criteria (Fig. 3).

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