CLINICAL STUDY

Velopharyngeal insufficiency and its associated pathologies in cleft patients

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Abstract

Objective:* A daily contact with cleft patients affected by velopharyngeal insufficiency (VPI) of various types and origins has stimulated us to analyze the associated disorders participating in the achieved functional results. In our experience, an early palate closure (in the first year of life) reduces the incidence of VPI and therefore the need of pharyngoplasty.** ***(Tab. 6, Fig. 1, Ref. 12.)
Key words: velopharyngeal insufficiency, pharyngoplasty, cleft palate (CP), cleft lip and palate (CLP).

At present, there are numerous concepts of comprehensive surgical treatment of cleft anomalies. In 1998 The European Register of the Eurocleft project comprised 178 cleft centres with 170 various operative protocols. Pursuant to our surgical protocol, more than 50 years in the case of a complete cleft lip and palate, a two-stage closure is preferred. For a lip reconstruction at the first stage, we usually use the Milliard technique in the unilateral (Millard, 1958) and the Black (Black, 1984) or Millard technique (Millard, 1977) in the bilateral cleft lip. During the second stage (after 6 months), we continue with the palatal closure using the Wardill-Kilner technique (Wardill, 1937). Throughout the existence of our cleft centre there has been a permanent effort aimed to applying new progressive operative techniques with the objective to improve both aesthetic and functional results. Therefore, in past few years, we have been successfully applying the Furlow double opposing Z-plasty (Furlow, 1986) for palate repair, which allows an excellent reconstruction of the velopharyngeal mechanism as well as a sufficient palate elongation using the Z-plasty.

The current comparative long-term follow-up, involving evaluation of the achieved speech quality and articulation, support the idea of early surgical velopharyngeal reconstruction and palatal closure, prior to the age of 1. In 2003 was the mean age of our patients with cleft lip repair about 4.2 months (range from 3–16 months), with the palate repair about 13.8 months (range from 4–48 months).

Tab. 1. Causes of VPI.

Causes of VPI (55 cases)	Number	%
CP	16	29.0
CLP bilateral	5	9.0
CLP unilateral	24	43.6
CP submucous	7	12.6
Velar paresis	3	5.4

Material and methods

Subjects

Subjects were selected from the patients who underwent comprehensive evaluations regarding to the symptoms of velopharyngeal insufficiency in the period 1991–2001. Fifty-five patients (33 males, 22 females) were included in the retrospective study on disorders associated with velopharyngeal insufficiency.

Surgeries

In 1991–2001 we performed a functional muscular palatal reconstruction in 552 cleft patients (321 CLP and 231 CP patients). The need for pharyngoplasty varies depending on outcome criteria. Based on the above mentioned criteria speech quality and articulation improvement, at present we indicate the superiorly based pharyngeal flap using the Hönig's technique (Hönig, 1968). In the period 1991–2001 was the Hönig pha-

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Tab. 2. Syndromes associated with VPI.

Syndromes associated with VPI (55 cases)	Number	%
Pierre-Robin syndrome	6	10.9
Juberg-Hayward syndrome	1	1.8
Patau syndrome	1	1.8
Situs viscerum inversus	1	1.8

Tab. 3. Age at Surgery.

Age at Surgery (55 cases)	Number	%
4–8 years	30	54.5
9–15 years	17	30.9
16–30 years	8	14.6

ryngoplasty performed in 73 patients (10.15 %) with mean age 10.5 years.

In our Cleft Center is indication for pharyngoplasty based on the structural and functional evaluation using:

– inspection of the movement of the soft palate and posterior and lateral pharyngeal walls and coordination of mimic muscles:

– detailed ENT examination,

– speech analyse (hypernasality, intelligibility, resonance and compensatory articulation) from preoperative and postoperative recordings,

– nasometer and acoustic analysis,

– nasendoscopic analysis,

– X-ray examination of the soft palate length and the angle of arising, evaluation of the distance between the soft palate and the posterior pharyngeal wall.

Results

Amongst fifty-five patients included in the study (Tab. 1), sixteen were affected by CP (29 %), twenty-four by unilateral CLP (43.6 %), five patients by bilateral CLP (9 %), seven by submucous CP (12.6 %), and three patients by velar paresis (5.4 %).

In our study the most common malformation syndrome associated with VPI was Pierre-Robin syndrome, which was present in 6 patients (10.9 %). Juberg-Hayward syndrome, Patau syndrome (Fig. 1) and also situs viscerum inversus was present in 1 patient (1.8 %) (Tab. 2).

The majority of patients (54.5 %) was operated on between the 4th and 8th year of age, because after this age more severe rehabilitative problems may occur in eliminating deviant articulation and compensatory mechanism (Tab. 3).

Before operation were the patients routinely screened by intelligence scales. In our study only 6 patients (10.9 %) demonstrated an important cognitive delay (Tab. 4).

Over 9 % of patients (5 cases) demonstrated a severe hypernasality (Tab. 5). Most of the patients demonstrated a moderate hypernasality (65.5 %).

Generally, the hearing loss observed in patients with velopharyngeal insufficiency is dependent on the middle ear disorders. The incidence of transmissive hearing loss was around 20 %, none of patients had a perceptive hearing loss (Tab. 6).

Discussion

It is well known, that the outcome of speech rehabilitation can be influenced by associated disorders. In our study, four syndromes were found as the associated malformations to the nine (16.4 %) cleft lip and/or palate patients. The associated syndromes

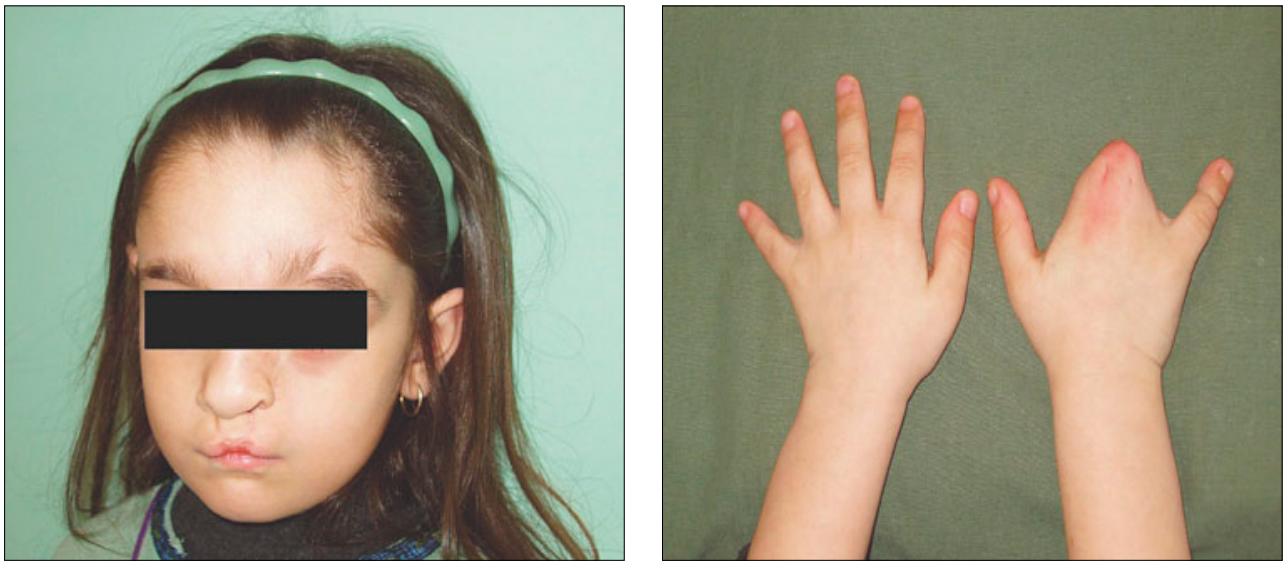

Fig. 1. Patau syndrome (e.g. microcephaly, cleft lip and palate, microgenia, hand deformities etc.).

Tab. 4. Cognitive problems.

Cognitive problems (55 cases)	Number	%
small delay	5	9.1
medium delay	10	18.2
important delay	6	10.9

Tab. 5. Linguistic problems.

Linguistic problems (55 cases)	Number	%
mild hypernasality	14	25.5
moderate hypernasality	36	65.5
severe hypernasality	5	9.0

Tab. 6. Audiological problems.

Audiological Problems (55 cases)	Number	%
normal	44	80.0
transmissive hearing loss	11	20.0
perceptive hearing loss	0	0.0

are often accompanied with cognitive and language delay or with other handicap. Various pathological aspects demonstrated by an individual patient should not be underestimated. Due to the specificity of the multiple symptom complexes is the need for multidimensional diagnostic and therapeutic approach more actual. There is a global tendency to concentrate the medical care in the cleft centers, where an interdisciplinary team, comprising experts from plastic surgery, anesthesiology, maxillofacial surgery, orthodontics, speech therapy, pediatrics, human genetics and psychology, has been established. Only this approach can bring the expected results compliant with high international criteria.

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 widespread. In this respect, at the beginning of the 80‘s, we have changed the operative timing of the primary repair in our Cleft Center, too. In our opinion, more than a 4 % decrease in pharyngoplasty in present is a direct consequence of this change.

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