STATUS OF LARYNX IN CHILDREN WITH CONGENITAL CLEFT OF UPPER LIP AND PALATE

Study of 215 children with congenital cleft of upper lip and palate in the age of 1.5 to 15 years has established the organic dysphonia in 27.4% of patients. Of the organic diseases of larynx there were edema, hypertrophy, nodules of vocal folds and chronic laryngitis whose frequency is directly dependent on duration and severity of the defect, age of patient and the timing of recovery of velopharyngeal ring. Pathology of the larynx gradually disappears with the growth of the patient after plastic reconstruction of oronasal defect.

(Keywords: Congenital defect of palate, larynx, damage of voice, dysphonia, children.)

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Introduction

Congenital cleft of upper lip and palate (CCLP) is the most common malformation of face and jaw, but it is worst of them in terms of severity of anatomic functional disorders (Lilin et al., 1983; Mamedov, 1997; Makhkamov, 2002; Ubaydullaev, 2001; Kharkov et al., 1990). Orofacial clefts take the second place in frequency of the “big five” anomalies. Clefts of lip and palate make 86.9% of all congenital malformations in the face. Almost every fifth of the typical cleft is a component of severe syndrome. Children born with CCLP are viable. Growing up in in optimal conditions they develop in much the same as their healthy peers. However, unlike the healthy, children with CCLP are more susceptible to damaging environmental factors. Accordingly, inflammation of the respiratory tract occurs 3-4 times more in such children (Mamedov, 1997).

The research aimed to study frequency and prevalence of pathological process in the larynx in patients with CCLP depending on age, duration, type and dynamics of the disease after cheilo-, urano- and veloplasty.

Materials and methods

We observed 215 children who were hospitalized with CCLP in clinics of pediatric surgical dentistry and ENT diseases, as well as those patients placed under outpatient dynamic observation in the polyclinic surgical dentistry of Tashkent Medical Academy. In accordance with the proposed by Frolova (1974) classification of congenital malformations of face and jaw, all children were divided into 4 groups (Table 1).

<table>
<thead>
<tr>
<th>Group</th>
<th>Congenital Pathology</th>
<th>Age (years) and sex</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>till 3</td>
<td>3-5</td>
</tr>
<tr>
<td>1</td>
<td>Isolated cleft of upper lip</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>2</td>
<td>Isolated cleft palate</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>One sided cleft of upper lip and palate</td>
<td>22</td>
<td>19</td>
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<tr>
<td>4</td>
<td>Double sided cleft of upper lip and palate</td>
<td>12</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>48</td>
<td>44</td>
</tr>
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</table>
Group 1: In congenital cleft of upper lip there is a right-handed or expressed through left-sided defect of the upper lip (16 children) and alveolar process (13 patients) (III b degree by Frolova). The tongue tip pushes in the defect of the upper lip and alveolar process. Entrance into nose from left and right has acorn-tipped shape, there is a marked asymmetry of the tip and wings of the nose. Breathing through unchanged healthy, left or right, nasal passage is free. At rhinoscopy with the internal structures of the nasal cavity pathology is not detected.

Group 2: Children with unilateral cleft palate; width of cleft in the uvula reaches 5 mm; on the border of hard and soft palate the cleft ranges from 5 to 17 mm, in the middle of the hard palate it makes 10-17 mm. All observed children have the open rhinolalia.

Group 3: There is a left or right expressed through defect of the upper lip in all children with unilateral congenital cleft of upper lip and palate. Cleft of alveolar process passes through the lateral incisor and is divided into large central and small lateral. Cleft of alveolar process becomes cleft of hard palate. The width of the defect in the alveolar process is 12-14 mm, in the middle of the hard palate - 12-15 mm, in the borders of hard and soft palate - 15-20 mm, in the uvula region the width reaches 20-25 mm. Vomer is turned to healthy direction and is inclined, connecting to palatine process of maxilla and isolating one half of the nasal cavity from the oral cavity. All observed children have the open rhinolalia.

Group 4: Children have bilateral congenital cleft of upper lip and palate; nasal septum is shifted to the right or left. Cleft of alveolar process is divided into three fragments: two small lateral and large central. Together with the alveolar process the teeth are biased and have anomalous position. Vomer, deflected to the right or left, is inclined. The width of the defect in the alveolar process varies from 3 to 8 mm, in the middle of hard palate - from 8 to 25 mm, on the border of hard and soft palate - from 12 to 20 mm, in the uvula region the width reaches 20-25 mm. 18 children had a cleft of uvula, soft and hard palate with the top passing through the cleft of alveolar process. Muscles of posterior pharyngeal wall are contracted actively with the pronunciation of sounds; but distinct Passavant’s ridge is missing and air leaks through the nose. All children have rhinolalia.

Results of investigation

Complaints about violations of the voice function (nasality, hoarseness varying types of severity) were from 151 (70.2%) children, of whom 99 (37.1%) children were in 4th and 3rd groups, 52 (24.2%) - in 2nd and 1st groups; and the rest - 24 (11.2%) children - spoke with aspiration. Oto-, rhino-, pharyngo- and laryngoscopy and endoscopic studies of ENT organs with video recording and photography were performed in all patients after anamnesis.

18 patients (8.4%) had false grains in anamnesis. 16 (7.4%) children had chronic pneumonia as accompanying diseases, of whom 11 (5.1%) children were from 3rd and 4th groups. 29 (13.5%) children suffered from chronic bronchitis, of whom 18 (8.4%) were from 3rd and 4th groups, asthma was noted in 2 (0.9%) children.

Methods of endoscopy studies of ENT organs depended on the age of patients. In children of early and junior school age the preference was given to rigid endoscopy (nasopharyngeal method) using rhinopharyngolaryngoscope of Karl Storz company with diameter of 2.5 mm. Rigid optics with 0° and 30° angles, 1.9 mm and 2.5 mm in diameter produced by Karl Storz company was used to inspect the nasal cavity and nasopharynx in 68 (31.6%) children in this age group. Both fibrolaryngoscopy with nasopharyngeal methodology and examination of larynx with a rigid endoscope of 70° angle and 4 mm in diameter using pharyngeal technique were used at endoscopy of the nasal cavity and nasopharynx to inspect the larynx.

Endoscopic study of school children was conducted primarily using indirect laryngoscopy; the hard optics of 0°, 30°, 70° angles and with 4 mm diameter from Karl Storz company were used with anxious children. In children of early and junior school age, as well as in
children of older groups in the troubled behavior or discomfort, the observation of nose, pharynx and larynx was carried out after 5-8 minutes after using local applicative anesthetic 10% Sol. Lidocain (spray).

The Yanagihara scale was used to estimate the severity of voice defects, the functional state of the larynx was estimated using the Vasilenko (2002) classification of voice disorders.

Functional dysphonia was diagnosed in 92 (42.8%) children, of whom 63 (29.3%) were in 3rd and 4th groups. Organic pathology (nodules, hypertrophy, edema, fissures, asymmetry of vocal folds during phonation, etc.), i.e. secondary functional dysphonia, was available in 59 (27.4%) patients, of whom 36 (16.7%) were in 3rd and 4th groups. Laryngeal pathology was not detected only in 64 (29.8%) children.

Edema of the true vocal folds was diagnosed in 11 (5.1%) children, varying severity swelling of the overfold space of larynx was in 14 (6.5%) patients. 5 children had edema of interarytenoid space, 3 children - edema of arytenoid cartilage, and 6 children had disseminated edema of vestibular folds. Nodules of true vocal folds, localized mainly in the middle third of the vocal folds (so-called vibrating center), were detected in 13 (6.1%) patients. Bilateral hypertrophy and hyperemia of the true vocal folds was identified in 12 (5.6%), discrepancy of folds in phonation - in 7 (3.3%), and posterior fracture of vocal folds - in 2 (0.9%). Dryness, thinning and preatrophic mucosa of the larynx were observed in a number of patients.

Children with congenital cleft of upper lip and palate were operated by the method of Limberg (1927), Frolova (1977) and Makhkamov (Frolova and Makhkamov, 1979).

Examination of larynx after cheilo-, urano- and veloplasty was evaluated after 6-12 months, and during the next 3 and 6 years.

Examination conducted after 6-12 months since the removal of the defect lip and palate showed that hoarseness and nasality remained in 62 (28.8%) children. Hypertrophy of the true vocal folds was indicated in 2 (0.9%) patients having previously normal vocal folds. Edema of the true vocal folds was found in 8 (3.7%) children; swelling of the overfold space of larynx - in 10 (4.6%); nodules on vocal fold - in 12 (5.6%) patients. Bilateral hypertrophy of true vocal folds was found in 10 (4.6%) patients; mismatch of folds in phonation was indicated in 5 (2.3%) patients. Crack of vocal folds remained in 2 (0.9%) children and 20 (9.3%) children spoke with aspiration.

Observation of the larynx in the period from 1 year to 3 years after the palatoplasty detected hoarseness in 35 (16.3%) children. Edema of the true vocal folds remained in 5 (2.3%) children; swelling of the overfold space of larynx remained in 4 (1.9%); bilateral hypertrophy of the true vocal folds was indicated in 6 (2.8%) patients; the true vocal folds nodules - in 7 (3.3%); and mismatch of folds when closing - in 2 (0.9%). Crack of vocal folds disappeared and swelling developed in 1 patient; 16 (7.4%) children spoke with aspiration.

Re-examination of larynx, after the formation of velopharyngeal valve in periods ranging from 3 to 6 years, detected hoarseness in 18 (8.4%) patients. Edema of true vocal folds remained in 3 (1.4%) patients; swelling of overfold space of larynx was indicated in 3 (1.4%) patients; bilateral hypertrophy of the true vocal folds - in 4 (1.9%) children; nodules of the true vocal folds - in 2 (0.9%); mismatch of folds in phonation in 2 (0.9%). Crack of vocal folds disappeared in 1 (0.47%) patient; and 6 (2.8%) children spoke with aspiration.

Endolaryngeal operative intervention was conducted in 4 (1.9%) patients to remove the nodules of the true vocal folds in the interval between surveys. Relapses did not occur after removal but edema appeared. Marked hoarseness developed in 1 patient due to thickening of folds.

Despite the restoration of velopharyngeal valve after removal of congenital cleft lip and cleft of the hard and soft palate, many children were in need of voice therapy to reduce hypernasality and nasal emission. Aspiration disappeared in 18 (8.4%) children after the
operation, but hoarseness in some of them remained (especially in presence of nodules, hypertrophy of the vocal folds). These patients were recommended to proceed with classes of logopedist and phono-pedagogue, with voice regime and integrated medication and homeopathic treatments aimed in improving the condition of mucosa and neuromuscular state of larynx.

Results of our observations have shown that there is no need for urgent surgical intervention in nodules and other pathologies of vocal folds. They disappeared after 2-6 years after surgery, as well as in the process of growth of the child. Age of children who experienced disappearance of pathological vocal cords and larynx was in average 15 years 7 months; while the average age of children with preserved or newly arisen pathology of vocal cords and larynx was 10 years 8 months. This suggests that the pathology of the larynx might disappear after the restoration of velopharyngeal valve and with growth process of children.

References


