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Changes in Sleep Disorders after Operation on the Ankyloglossia with Deviation of the Epiglottis and Larynx

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ABSTRACT

The symptoms of the ankyloglossia with deviation of the epiglottis and larynx (ADEL) vary in adults. Such symptoms include headache, stiffness of the shoulders, cold sensation of the extremities, fatigue, snoring, daytime somnolence and so on. Questionnaires about these symptoms were sent before operation for the ADEL and one month after surgery to one hundred fifty two adults. The results of the questionnaires showed high improvement after the operation. Blood oxygen saturation rate (SpO₂), pulse rate (PR) and nasal airflow (NA) during sleep were compared before and after surgery in these ten adults with a portable sleep monitor (Fukuda Electric Co. LS-100). The average SpO₂ and minimum SpO₂ were increased after the operation. The Respiratory disturbance index (RDI), duration of the low SpO₂ and PR were decreased. Sleep disorders, stiffness of the shoulders, lumbago, fatigue and general malaise were improved after the CGL (Correction of the Glosso-Larynx; the operation on the ADEL). These observed ameliorations might have been caused by improvements of the respiratory condition after the CGL. CGL is less invasive than the other operations for sleep disorders and resulted in improvements for these sleep disorders. CGL can be recommended treatment for OSAS.

Key words: ankyloglossia with deviation of the epiglottis and larynx (ADEL)/ correction of the glosso-larynx (CGL) / sleep apnea syndrome (SAS) / genioglossus muscle (GM) / respiration

INTRODUCTION

ADEL is a condition in which the tongue, epiglottis and larynx are displaced upward and forward. This condition is independent of the existence of the frenum linguæ or not (1-5). This condition not only increases the resistance of the upper airflow, but also inhibits respiration. The CGL procedure cuts several bundles of the genioglossus muscle (GM). The tongue, epiglottis and larynx move backward and downward by the CGL. As the results the epiglottis and larynx stand strait to the epipharynx, or post-nasal cavity. The respiratory rate, volume capacity and 1% forced airflow increase after the CGL (4).

Symptoms seen in babies – such as crying hard, cyanosis, bending backwards, always wanting to be in someone’s arms and sleep apnea – disappear just after the CGL. The parents of previously afflicted babies are very pleased with the improvements noted and the decrease in care required following the CGL.(5).

Changes in the symptoms of ADEL and in sleep were studied in this report.

MATERIALS AND METHODS

Questionnaires were sent to one hundred fifty two adults with mean age of 33.1 years old (78 males, 74 females) before and one month after CGL (Figure 1). The amelioration rate (AR) was calculated for the twenty items contained on each questionnaire, such as general conditions, pronunciations and sleep conditions. Ten adults out of the one hundred fifty two were monitored in terms of SpO₂, PR and NA during sleep before and after CGL with a portable sleep monitor (Fukuda Electric Co. LS-100).
Figure 1: Distribution of the age group and inquired persons ratio of male and female

CGL
The operative procedure of the CGL is illustrated on figure 2 (6,7).

Figure 2: Process of CGL
1. After injection of the local anesthetizer, the tip of the tongue is pulled up with a thread.
2. The middle of the abdominal tongue is incised cross shape. The cut field opens rhomboid.
3. The first bundles of the GM appear after separation of the connective tissues.
4. Next, these bundles are cut. Strip out next left second bundles of the GM Cut it after ligatured the bundles up and down. The same procedure is employed to the right second bundles.
5. The third layers of the GM are cut if necessary.
6. The CGL will complete in ten minutes. Then the operated wound must be open.

RESULTS
Acquired AR of each item was high as shown in figure 3. Better changes by receiving the CGL were as follows; Breathing turned easy, less fatigable after it, can sleep well, headache and stiffness of shoulders disappeared. On the contrary troubles after the CGL were pain and difficulty of phonation. Those were temporally and they were disappeared one month after the CGL. The pain continued in about two to three days (Figure 4).

23.5% of questionnaired remarked that they are much satisfied with the CGL and 70.6% of them are satisfied it. Total of 94.1% are satisfied with receiving the CGL (Figure 5).

Average SpO2 and lowest SpO2 during sleep were increased. Duration of low SpO2 and PR during sleep was decreased. Average RDI (Respiratory Disturbance Index) decreased from 22.5 to 14.6 and average duration of the apnea decreased from 28.1 sec to 21.6 sec (p<0.05, Paired t test) (Figure 6).

Figure 3: Ameliorated rate in each questioned items

Figure 4: Days that continued pain after CGL
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REFERENCES


FIGURE 5: Satisfied rate after the operations

FIGURE 6: A) Changes of average SpO2 before and after CGL
B) Changes of minimum SpO2 before and after CGL
C) Rate of under 95% of SpO2 during sleeping
D) Pulse rate before and after CGL

DISCUSSION

The CGL procedure may improve sleep, reduce general malaise, alleviate stiff shoulders and reduce back pain due to improved respiration (1,3,4).

The number of traffic accidents in people with OSAS is three times that of controls (8). It was reported that the accidents and near misses decreased by employing CPAP and the treatment for SAS (9). In addition to automobile accidents, it is conceivable that train travel and air travel can be more safe by improved wakefulness and vigilance on the part of conductors and pilots. It is said that there are almost two million people who need treatment for SAS in Japan. The treatments for SAS are CPAP, sleep sprint, UPPP or ZPP surgery (10,11). CGL is less invasive than these techniques and shows good efficacy in improving sleep problems. CGL is a new and useful treatment for SAS.
REFERENCES


INTRODUCTION

inner ear and maintains the cell's normal structure and function by retaining a high level of the organellae of the inner ear. In general, the pathophysiological process is guided by changes in the inner ear structure and function. Although it is still unknown how the inner ear structure and function are affected, it is likely that the inner ear structure and function develop in a specific period of embryonic development. The inner ear structure and function include the development of the inner ear structure and function, the development of the inner ear structure and function, the development of the inner ear structure and function, and the development of the inner ear structure and function. The inner ear structure and function develop at specific periods of embryonic development. The inner ear structure and function develop at specific periods of embryonic development.

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