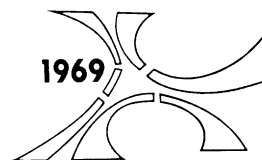


Cleft Palate and Its Treatment



P. GUNS, M.D.
Louvain, Belgium

In order to make a study of the surgical treatment and speech therapy of cleft palate patients, one must first of all thoroughly understand the embryological development and the synergical function of the muscles of the rhinopharynx, the soft palate, and the pharynx.

Embryology

Cleft palate is the consequence of an arrested development of the incisive bud and of the maxillary bud. The fusion is later than for the lip (60 days). It is always completed before the 90th day. By the 9th embryonic week, the hard palate is formed but not ossified. This ossification of the palatine apophysis comes from 6 or 7 different centers of ossification.

Myology of the Soft Palate

The muscles which are inserted into the palatine apophyses make-up the soft palate. Through their functional synergy with the pharyngeal muscles, in particular, the upper constrictor of the pharynx, those muscles function to result either in normal speech or open rhinolalia.

Let us remember that the soft palate (a muscular-membranous partition) is essentially mobile and contractile; it lowers and raises with the action of certain muscles.

The soft palate comprises a palatine aponeurosis which occupies the front third of the total length of the soft palate and is of quadrangular form. It is found in front of the palatine arch and laterally at the hook of the pterygoid apophysis.

There are five muscles on each side: the *palato-staphylin*, which shortens the soft palate; the *internal peristaphylin*, which raises the palate and draws it back; the *external peristaphylin*, which is the tensor of the palate; the *pharyngo-staphylin*, which narrows the pharyngo-rhino-pharyngeal area in the form of a buttonhole; and the

Prof. Dr. Guns is affiliated with the Service D'Oto-Rhino-Laryngologie and Centre D'Audio-Phonologie, Université Catholique de Louvain.

This paper was presented at the 1969 International Congress on Cleft Palate, Houston.

glosso-staphylin, which lowers the palate and narrows the buccopharyngeal opening.

Etiology

The causes of cleft palate have been questioned in recent years. There is some belief that a palatal division can take place under four conditions. a) It can occur when there is undernourishment of the embryo and a lack of vitamin A. b) It can occur in purely hereditary cases. In this case, the predisposition of boys and of the left side is clear. c) It can occur following circulatory problems in a pregnant woman, such as with amniotic adhesion which results from pressure exerted upon certain parts of the embryo preventing normal union of the parts. It can occur following the presence of toxic substances in the circulation of the pregnant woman. In an experiment on mice, it was demonstrated that the administration of cortisone at the beginning of gestation produces either a cleft lip or cleft palate in 44% of the offspring. It can be concluded from this that the administration of certain drugs to the pregnant woman during the period of formation of the palatine bud from the 45th to the 72nd day of gestation is dangerous. However, we must remember that among the breeds of experimental animals there are those which produce few toxic malformations while other breeds have nearly 100% malformations.

The impact of all these causes produces a European frequency of the affliction of 8/1000 maternity cases in Zurich; heredity is certain in 20 to 26% of the cases. A review of the literature shows that evidence of heredity is found in 53% of boys versus 47% of girls. In Pennsylvania, one child of 762 is born with either cleft lip or cleft palate. When comparing incidence from place to place, however, one should be careful with statistics.

Classification

We have remained faithful to the following classification: Type 1. Division of the soft palate, always median; complete or incomplete: 20.8%. Type 2. Division of the soft and hard palate; complete or incomplete, unilateral or bilateral: 30.8%. Type 3. Unilateral or bilateral division with schism of the dental arch: 38.8%. Type 4. Bilateral complete, the so-called "wolf's snout": 9.6%.

With these data in mind, the principle of operation for closing of the palatine cleft arises.

The uranostaphylography has to be carried out by lengthening the soft palate, avoiding the cicatricial retraction of the palate. We shall cite here as a reminder, though it is exceptional, the necrosis of the palate as a result of severing of the posterior palatine artery.

Let us see at what age an operation ought to take place? What are the failures? What are the results?

At What Age to Operate?

The classicists customarily make a distinction between the German method (12 years) and the French method (6 years). At present, it is admitted that it is necessary to operate as early as possible and, in many cases, before the young patient has begun to talk, so that he will not learn incorrect use of his abnormal nasobuccal cavity of resonance. The operation must be performed when the subject has more resistance, his oral cavity is wider, the operating field is more accessible, and there is more tissue for closing the cleft; that is, before the age of two. However, I have recently operated at about the age of one year with good results. Another factor to be considered is that subjects with cleft palate usually talk later (at 18 to 20 months); they are retarded in speech.

What Are the Failures?

Complete failures are caused either by infection or by sphacelus of the flaps. The first cause is eliminated by preoperative and postoperative antibiotic therapy. Sphacelus would always be avoided if care were taken not to section the nourishing pedicle of the flaps, namely the posterior palatine artery which emerges from the posterior palatine opening.

However, partial failures do exist. They may be avoided by a proper dissection of the oral and nasal flaps, permitting suturing without excessive traction.

In summary, in order to obtain good anatomical and functional results, several conditions are necessary. a) Operate between 18 and 24 months of age. b) Detach soft tissue broadly on both a nasal plane and a buccal plane. c) Lengthen the soft palate from 0.5 to 0.7 centimeters by freeing the posterior edge of the palatine apophysis. d) Avoid stretching by practicing the disinsertion of the fixed muscles to the internal apophysis of the pterygoidal apophysis, maintaining this disinsertion for about 8 days, and applying an alimentary nasal probe during the same time. e) Avoid the necrosis of the flaps while protecting the vascular integrity, being

TABLE 1. Results of palate surgery, 1942-1955.

	<i>number of patients</i>	<i>failures N</i>	<i>%</i>	<i>phonetic difficulties N</i>	<i>%</i>
1942-1945 (without antibiotics)	29	10 partial	37	4 severe	13.2
1945-1955 (with antibiotics)	200	10 partial of whom 1 bilateral 2 complete 1 sphacele 1 died	5	6 severe 2 slight	6

sure to avoid injury of the posterior palatine artery. f) Avoid infection by use of antibiotics.

What Are the Results?

A great number of those operated on speak intelligibly and correctly after the operation. A minority must undergo speech therapy. Our results from 1942–1955 are presented in Table 1.

Many children with cleft palate whether operated or not show faulty articulation. In 65% of the total group, there is reduced mobility of the tongue and problems of muscular coordination. This is why a certain amount of therapy is necessary. It should be begun as early as possible after the operation. It will be aimed at respiration, articulation of consonants, syllables, and words. Often exercises of the lips, tongue, and soft palate are used.

Summary

The problem of cleft palate has been reviewed and methods for treatment discussed. Results of twenty-three years of palate surgery are presented.

reprints: *Prof. P. Guns*
Universite Catholique de Louvain
Cliniques Universitaires St. Pierre
Service D'Oto-Rhino-Laryngologie
et Centre D'Audio-Phonologie
69, Rue De Bruxelles
Louvain, Belgium

Ed.: References not accessible at time of publication.