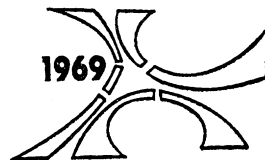


Classification of Cleft Lip and Palate for Machine Record Coding



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There are four basic structures involved in the defect of cleft lip and palate: the lip, the alveolus, the hard palate, and the soft palate. These basic structures may be involved either completely or incompletely in many combinations of clefts. This variability makes it somewhat difficult to establish a single simple classification scheme with which accurate data retrieval can be performed. Existent classifications are not suitable for specific categorization of borderline cases and therefore retrieved data would not be accurate.

Review

One of the first classifications in the literature is probably that of Davis and Ritchie (3) which appeared in 1922. In this system, the alveolar process is the line of division. The classification is the following: Group 1, prealveolar clefts; Group 2, postalveolar clefts; and Group 3, complete alveolar clefts. Brophy (2) in 1923 presented a classification consisting of 15 groups. A classification in common use is that presented by Veau in 1931 (5). Veau used four groups for his recordings: Group 1, clefts of the soft palate; Group 2, clefts of the hard palate; Group 3, complete unilateral cleft of lip, alveolus, and palate; and Group 4, bilateral cleft lip, alveolus, and palate. But in this method, isolated clefts of the lip were not included.

Considering relevant embryology, anatomy and physiology, in 1953, Pruzansky (7) tabulated clefts of the lip and palate into four categories: a) cleft lip, b) cleft lip and cleft palate, c) cleft palate, and d) congenital insufficiency of the palate. Pruzansky did not include the alveolar process as a separate entity because, in his opinion, the more complete the defect in the lip the greater was the cleft in the alveolar process.

Kernahan and Stark (5) proposed the following classification in 1958 in which the incisive foramen is used as the dividing point between the

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lip and the palatal clefts: a) clefts of the primary palate (clefts anterior to the incisive foramen), b) clefts of the secondary palate (clefts posterior to the incisive foramen), and c) clefts of the primary and secondary palate.

The Nomenclature Committee of the American Association for Cleft Palate Rehabilitation in 1960 proposed a morphological classification of congenital cleft lip and palate. It was agreed that the purpose of any classification is to facilitate recording and communication of information and ideas concerning the phenomena observed (4). This classification has two major headings, each with two sub-headings: a) prepalate: lip, and alveolar process to incisive foramen; and b) palate: soft palate, and hard palate to incisive foramen. In this classification, provisions are made for location (right, left, median), extent (1/3, 2/3, 3/3), and width of the cleft. In addition, specific modifications are made for palatal attachment to the vomer, rotation and protrusion of the premaxilla, submucous cleft, and congenital scar of the lip.

The most recent classifications of cleft lip and/or palate were prepared by Paradowska and Jaworska (6) in 1964 and by Bardach and Perczyńska-Partyka (1) in 1965.

From the classifications reviewed above, one is forced to agree with Pruzansky when he wrote that "...most classifications that have appeared in the literature are insufficiently descriptive and arbitrarily reflect the clinical interest of a single professional group without providing universal intelligibility" (7). Yet, in the majority of cleft lip and palate programs, it is desirable to retrieve data for research purposes. Unless machine record technics are utilized, the summarizing and correlation of data is difficult and time consuming.

It is the main purpose of this work to present an exact and flexible method for the classification of cleft lip and/or palate. This method has been devised to be used especially for machine record coding: conceivably it may be convenient for other uses. This classification is founded on the fact that when defective embryologic development results in labial or oral clefts, four basic structures may be involved, either partially or completely: the lip, the alveolus, the hard palate, and the soft palate. The incisive foramen is used as the dividing point between clefts of the alveolus and the palate.

Classification System

In general, the code consists of the use of four digits indicating whether the cleft is present, and if present, its location (Figure 1). Each digit may be followed by a letter, to describe whether the condition is complete, incomplete, or submucous.

Starting from the left, the first digit represents the condition of the lip, the second, the condition of the alveolus, the third, the condition of the hard palate, and the fourth, the condition of the soft palate. With this

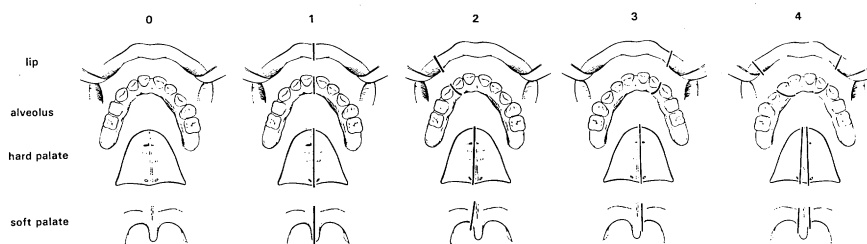


FIGURE 1. Classification of cleft lip and/or cleft palate.

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- A. The digits, four in number, represent the four structures affected by the cleft.
 The *first* digit refers to the lip.
 The *second* digit refers to the alveolus.
 The *third* digit refers to the hard palate.
 The *fourth* digit refers to the soft palate.
- B. The numbers used as digits represent the presence or absence of a cleft.
 0: no cleft.
 1: midline cleft.
 2: cleft on right side.
 3: cleft on left side.
 4: bilateral cleft.
- C. The letters indicate more specifically the type of cleft.
 A: an incomplete midline cleft.
 B: an incomplete cleft of the right side.
 C: an incomplete cleft of the left side.
 D: a bilateral incomplete cleft.
 S: submucous cleft.
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FIGURE 2. Summary of classification.

classification the condition of these four structures may be described by use of the digits taken from the following five possibilities: 0, no cleft; 1, midline cleft; 2, cleft of the right side; 3, cleft of the left side; and 4, a bilateral cleft.

Using letters in developing the classification to describe incomplete and submucous clefts, will keep the integrity of the four basic digits. The letters are used in the following way: A indicates an incomplete midline cleft, B indicates an incomplete cleft on the right side, C indicates an incomplete cleft on the left side, D indicates a bilateral incomplete cleft, and S indicates a submucous cleft.

In consideration of the palate, a midline cleft is one in which the nasal septum does not unite with the palate and its inferior border is above the level of the palate bone. A cleft of the right side is one in which the septum lies to the left of the defect and may or may not be attached to the left side of the palate. The left side cleft is just the converse of this. Finally, when the lower border of the septum is at the same level or lower than the lateral halves of the palate and not attached, the defect is considered a bilateral cleft.

Whenever a cleft is described without specifying whether it is complete or incomplete, it is assumed that it is a complete cleft. In a case where there are clefts of the lip, and of the hard and soft palate, and no information is given in regards to the alveolus, this structure will be considered completely affected with a cleft. Besides, referring to the palate, all cases will be considered midline clefts unless otherwise specified. The following are examples of the method when the information given is incomplete.

EXAMPLE 1. A cleft of the soft palate is coded *0001*, indicating that there are no clefts of the lip, alveolus, and hard palate but that the soft palate has a complete cleft in the midline.

EXAMPLE 2. A pre-alveolar cleft lip, left side, and post-alveolar cleft palate is coded *3011*.

EXAMPLE 3. A bilateral complete cleft lip and cleft of the palate is coded *4411*, indicating that there is a bilateral cleft of the lip, a bilateral cleft of the alveolus, and midline clefts of the hard and soft palate.

EXAMPLE 4. An incomplete cleft of the hard palate and cleft of the soft palate is coded *001A1*, indicating that there is an incomplete midline cleft of the hard palate and complete midline cleft of the soft palate.

EXAMPLE 5. A bilateral cleft lip and cleft of the palate with an incomplete cleft lip of the right side is coded *4B411*.

EXAMPLE 6. A submucous cleft of the hard and soft palate is coded *001S1S*.

Machine Record Coding

In classifying oral clefts for machine record data storage, it is necessary to develop a method which will permit later retrieval of all information possible relating to the extent and type of clefts involved. In addition, this system must be simple and simultaneously acceptable to both the clinician and the epidemiologist.

These requirements can be met if the lip, the alveolus, the hard palate, and the soft palate can be handled as separate areas, and if a code number is established which will identify the condition of each one separately. Proper programming will then permit the retrieval of data relating to the total extent of the cleft, or to any of its parts.

One column of the card can be assigned for each of the four areas. Each of these areas can have the following possibilities that can be coded under the appropriate column. The column designation is the following: 1st column—lip, 2nd column—alveolus, 3rd column—hard palate, and 4th column—soft palate. The column numbers are the following: 0, no cleft, 1, midline cleft; 2, cleft of right side; 3, cleft of left side; and 4, bilateral cleft.

EXAMPLE 7. A cleft involving only the left side of the lip is coded *3000* (see Figure 3).

Such coding as appears in Example 7 does not include the flexibility to

	<i>1</i> <i>lip</i>	<i>2</i> <i>alveolus</i>	<i>3</i> <i>h. palate</i>	<i>4</i> <i>s. palate</i>
coding	3	0	0	0

FIGURE 3. Representation of machine record coding for a cleft of the lip, left.

	<i>1</i> <i>lip</i>	<i>2</i> <i>alveolus</i>	<i>3</i> <i>h. palate</i>	<i>4</i> <i>s. palate</i>
Example 8. Cleft lip only, left side	30	00	00	00
Example 9. Incomplete cleft of the hard and soft palate	00	00	11	10
Example 10. Bilateral cleft lip, incomplete on the left; right complete cleft of alveolus, hard and soft palate	43	20	20	20
Example 11. Submucous cleft of the hard and soft palate	00	00	15	15

FIGURE 4. Examples of machine record coding with expanded coding technique.

describe whether a cleft is complete, incomplete, or submucous. In order to accomplish this, an additional column with the following number coding is needed, which will replace the letter code previously described: 0, complete; 1, incomplete midline cleft; 2, incomplete cleft of the right side; 3, incomplete cleft of the left side; 4, bilateral incomplete cleft; and 5, submucous cleft.

The expanded coding of Example 7 is then 30 00 00 00 (see Figure 4 for Examples 8, 9, 10, and 11).

Summary

A classification for cleft lip and palate has been devised. With this classification any kind of cleft or any combination of such defects can be described easily with a series of four digits with alphabetical suffixes. For machine record coding, numbers are substituted for the letters. This method can be used to describe specifically any cleft and also permits retrieval.

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