

Incidence and Type of Otologic Disease in the Older Cleft-Palate Patient

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It is well recognized that chronic middle ear disease in various forms is a common, if not ubiquitous, occurrence in the patient with a cleft palate (3, 4, 7). The current emphasis in both clinical research and therapy is in the infant and is primarily directed toward the prophylaxis of subsequent chronic middle ear disease (5, 6). In view of this interest, it seemed appropriate to examine an older series of patients with clefts who had not had the benefit of such long-term regular prophylactic otologic care. Specifically, this report was designed to answer two questions:

1. Given a population of patients with clefts, 16 years or older, selected at random, what is the frequency and type of middle ear disease as determined by otoscopy and audiometry?
2. Since previous experience had already indicated that otopathology in this older population would not be a universal finding, (1, 3) is there a cluster of characteristics that can delineate in cleft type or management history that might predispose toward or provide immunity against middle ear disease in adulthood?

Subjects

Thirty-one patients 16 years or older were selected at random and studied. The distribution of cleft types as related to sex and age are delineated in Table I.

All otologic and audiologic evaluations were performed by the same otologist and audiologist. Audiologic testing was performed in a sound-treated room using a Beltone Audiometer calibrated to ISO standards. The criteria for delineating otopathology were divided into (a) active disease, and (b) inactive disease. Criteria for active otopathology included the presence of any one or combination of the following, either existing bilaterally or unilaterally:

- a. Tympanic membrane perforation.

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TABLE I. Cleft type as related to age and sex.

| <i>cleft type</i> | (<i>n</i> = 16) ♂ | (<i>n</i> = 15) ♀ | <i>age range (yrs.)</i> |
|-------------------------------------|--------------------|--------------------|-------------------------|
| Left cleft lip and palate..... | 7 | 1 | 17-29 |
| Right cleft lip and palate..... | 3 | 0 | 21-27 |
| Bilateral cleft lip and palate..... | 2 | 4 | 17-22 |
| Cleft palate..... | 4 | 10 | 17-33 |

- b. Cholesteatoma: as defined initially by otoscopy and middle ear tomography and subsequently confirmed at surgery.
- c. Conductive hearing loss averaging 20 decibels or more in the frequency range of 500-2,000 Hz.

Inactive disease was defined as the presence of any one or combination of the following, existing bilaterally or unilaterally:

- a. Tympanic membrane tympanosclerosis.
- b. Atrophy of the tympanic membrane.
- c. Tympanic membrane adhesions to various middle ear structures.
- d. Conductive hearing loss averaging 20 decibels or less in the frequency range of 500-2,000 Hz.

The distribution of cleft types as related to the presence or absence of otopathology is depicted in Table II. Focusing upon the group with otopathology, nine had otopathology as defined as active (six with cholesteatomas, and three with tympanic membrane perforations) (Table III).

The average conductive hearing loss fell equally beyond and within the 20-decibel range as previously described. Isolated cleft palate patients accounted for five of the active otopathologic patients, with the remaining four being distributed among the other cleft types.

Inactive disease was again predominant in the isolated cleft palate group and was randomly distributed among the other cleft types.

In addition to categorizing cleft type as related to variations of otopathology, additional characteristics regarding cleft type and management history was delineated.

An independent experienced observer classified each patient by utilizing serial cephalometric X-rays, serial speech ratings, and serial cast models of the cleft form. The following selected variables were studied and categorized:

- 1. Speech rating as determined by a speech therapist.

TABLE II. Distribution of otopathology as related to cleft type.

| <i>cleft type</i> | <i>Otopathology (-)</i> <i>n</i> = 14 | <i>Otopathology (+)</i> <i>n</i> = 17 |
|-------------------------------------|--|--|
| Left cleft lip and palate..... | 5 | 3 |
| Right cleft lip and palate..... | 2 | 1 |
| Bilateral cleft lip and palate..... | 3 | 3 |
| Cleft palate..... | 4 | 10 |

TABLE III. Criteria for otopathology.

| |
|--|
| 1. Active Disease |
| a. Tympanic membrane perforation |
| b. Cholesteatoma |
| c. Hearing loss >20dB (500-2000 Hz) |
| 2. Inactive Disease |
| a. Tympanosclerosis |
| b. Atrophic tympanic membrane |
| c. Adhesions of tympanic membrane to middle ear structures |
| d. Hearing loss <20dB (500-2000 Hz) |

2. Velopharyngeal valving: This was determined by examining serial lateral cephalometric radiographs during the sustained phonation of /u/ and /s/. If valving on /s/ was complete while that on /u/ was not, as was sometimes observed, the best performance was accepted.

3. Palatoplasty either before or after the age of three.

4. The necessity of pharyngoplasty.

In the group of patients without otopathology, good speech and velopharyngeal valving appear as predominating factors. (Table IV)

Discussion

At best, this report should be regarded as a pilot study clearly indicating that in patients with clefts, 16 years and older, middle ear disease is not ubiquitous as it appears to be in the infant. This may suggest that in the absence of uniform prophylactic otologic care a significant number of patients seem to be immune from the presumed handicap of cleft related middle ear pathology.

Bennet (1) found the incidence of significant otopathology in the adult cleft palate patient to be approximately 50%, with a greater incidence of otopathology in the bilateral cleft lip and palate patient. Cole, et al. (2) noted that 43% of adult cleft palate patients studied had poor eustachian tube function, but subclassification as to cleft type was not presented.

TABLE IV. Selected variables as related to otopathology.

| selected variables | | status of ears | |
|--------------------|--------------|-----------------|-------------------|
| | | normal (n = 14) | abnormal (n = 17) |
| Speech | Good | 12 | 7 |
| Rating | Fair | 1 | 6 |
| Velopharyngeal | Good | 12 | 9 |
| Valving | Poor | 2 | 8 |
| | Before age 3 | 5 | 4 |
| Palatoplasty | After age 3 | 9 | 10 |
| | None | 0 | 3 |
| Pharyngoplasty | Yes | 9 | 10 |
| | No | 5 | 7 |

The attempt to delineate certain variables predisposing to middle ear disease in the adult cleft patient resulted in inconclusive findings except to suggest that the presence or absence of velopharyngeal valving may be directly related to the presence or absence of otopathology in the older patient with a cleft palate. These findings also suggest that there is definite need for further study as to specific categories of otopathology as to its incidence in various cleft types, since there appears to be both a high-risk and low-risk otopathologic group within the general cleft population. It is anticipated that the eventual revelation of factors specifically related to either cleft type or management history may provide further data as to the decreasing incidence or persistence of otopathology from infancy to adulthood.

In agreement with previous otologic investigations on whatever age group, the present study re-emphasizes the need for long-term otologic surveillance of the patient with a cleft. It also supports the emerging recognition that cleft palate is not purely a congenital disruption of velar morphology, but rather a constant complex interrelationship between velar and otic pathology. Prudent therapy implies co-recognition and comprehension of these variations in cleft form and their specific otopathologic sequelae.

Summary

Cleft lip and palate patients, 16 years and older, selected at random, were studied to determine the type and frequency of middle ear disease. Various morphologic and physiologic factors interrelating to cleft form and otopathology are discussed.

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References

1. BENNET, M., The Older Cleft Palate Patient. (A Clinical Otologic-Audiologic Study). *Laryngoscope*, 82, 1217, 1972.
2. COLE, R. M., J. E. COLE, and S. INTARAPRASONG, Eustachian Tube Function in Cleft Lip and Palate Patients. *Arch. Otolaryng.*, 99, 337, 1974.
3. GRAHAM, M. D., A Longitudinal Study of Ear Disease and Hearing Loss in Patients with Cleft Lips and Palates. *Annals of Otol., Rhino., Laryng.*, 73, 34, 1964.
4. PANNBACHER, M., Hearing Loss and Cleft Palate. *Cleft Palate J.*, 6, 50-56, 1969.
5. PARADISE, J. L., and D. D. BLUESTONE, More on the Universal Occurrence of Otitis Media in Infants with Cleft Palate, and A Preliminary Evaluation of Its Treatment. Presented at the 29th Annual Meeting of the American Cleft Palate Association, Pittsburgh, Pa, April 23, 1971.
6. PARADISE, J. L., C. D. BLUESTONE, and H. FELDER, The Universality of Otitis Media in 50 Infants with Cleft Palate. *Pediatrics*, 44, 35, 1969.
7. STOOL, S. E. and P. Randall, Unexpected Ear Disease in Infants with Cleft Palate. *Cleft Palate J.*, 4, 99, 1967.