UNILATERAL CLEFT LIP AND/OR PALATE:
THE RELATIONSHIP BETWEEN GLUE EAR, GROMMET AND HEARING OUTCOMES OVER A 30-YEAR PERIOD

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KEY POINTS

• The current findings reveal marked dissimilarity in the pattern of middle ear problems with influence of age and cleft type on incidence of OME and related long-term hearing outcomes.

• The age of OME onset and the duration of OME without VT insertion influence strongly OME and related long-term hearing outcomes.

• Early VT insertion can be proposed as an option with relatively few and easy complications to handle, to prevent damage to the middle ear and mastoid mucosa, to the tympano-ossicular system and related hearing loss.

Methods

Retrospective study of 404 non syndromic unilateral cleft lip (CLP) and/or palate (CP) patients born between 1986 and 2016. A subgroup of 146 patients was individualized to conduct analyses in regards to long-term outcomes. All children were managed at the same tertiary level center and benefited from the experience of the cleft palate multidisciplinary team. Type of pathology, middle ear effusion duration, number of grommet insertion and gender were evaluated for possible association with abnormal hearing thresholds using logistic regression at different time-point. Significant predictors were further evaluated with multivariate analysis. We examined the relation between VT insertion, middle ear effusion duration and otologic outcomes in our cohort longitudinally followed over time to assess a better picture of cumulative incidence and factor influences at different time-points.

Results

The cohort included 404 patients with 175 CLP and 229 CP, 242 male and 162 female. In the CLP group, 77.5% experienced at least one episode of documented OME and 60.7% benefit from VT insertion with 23% reporting abnormal hearing (AH) at eight years, in CP group this was 45.1% OME and 30.5% VTI with 13.3% AH, respectively.

Long term results – 15 years follow-up : 146 patients

The peak incidence for AH was at two to four-years-old with respectively 60% and 43% in the CP group and 66% and 35% in the CLP group. Figure 1 shows, at four and six years of age, that CLP children with VT had a statistically better hearing in comparison with their peer who did not have VT (respectively p = 0.019 and p = 0.009). Whether in CP or CP, analyses revealed a positive effect of grommet insertion on hearing at six years old. The CLP children tended to present a higher risk of hearing loss at six years old in comparison with CP children (Fig.1 & 2). Multivariate logistic regression between age of onset of OME and pathology revealed a trend (p = 0.056) between the pathology and the hearing at 15 years of age and a significant effect between age of onset OME and hearing at 15 years old. A child with CLP increased drastically their risk of presenting an abnormal hearing at 15 years old with an Odds ratio of 5.33 times that of a child presenting with a cleft palate (p = 0.013, CI = 1.584-24.423). The youngest a child experience his first OME the worse his hearing will be at 15 years of age (p = 0.043, OR = 0.750; CI = 0.557-0.978).

The better predictor identified was the duration of the middle ear effusion, without having grommet inserted, from two (OR = 1.001; 95% CI = 0.999-1.003) to nine years old (OR = 1.001; 95% CI = 1.000-1.002). The risk of poor long-term hearing outcomes increases as the middle ear effusion persists.

Figure 1. Difference between the proportion (%) of children with abnormal hearing (AH) and the proportion (%) of children with normal hearing (NH), with or without ventilation tube (VT) for the CP (left panel) and CLP groups at different ages. Results from the chi-square test with statistical significance are denoted as P < 0.05.*

Figure 2. Percentage of children with normal (NH) and abnormal hearing (AH) related to ventilation tube (VT) insertion across ages. Children from the cleft palate group (CP) are presented in a, children born with cleft lip palate (CLP) are shown in b. Results from the chi-square test with statistical significance are denoted as P < 0.05.*