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REVIEW

Outcomes in facial aesthetics in cleft lip and palate surgery: A systematic review

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Summary *Background:* While there are internationally validated outcome measures for speech and facial growth in cleft lip and palate patients, there is no such internationally accepted system for assessing outcomes in facial aesthetics.
Method: A systematic critical review of the scientific literature from the last 30 years using PUBMED, Medline and Google Scholar was conducted in-line with the PRISMA statement recommendations. This encompassed the most relevant manuscripts on aesthetic outcomes in cleft surgery in the English language.
Results: Fifty-three articles were reviewed. Four main means of determining outcome measures were found: direct clinical assessment, clinical photograph evaluation, clinical videographic assessment and three-dimensional evaluation. Cropped photographs were more representative than full face. Most techniques were based on a 5-point scale, evolving from the Asher-McDade system. Multiple panel-based assessments compared scores from lay or professional raters, the results of which were not statistically significant. Various reports based on cohorts were poorly matched for gender, age, clinical condition and ethnicity, making their results difficult to reproduce.
Conclusions: The large number of outcome measure rating systems identified, suggests a lack of consensus and confidence as to a reliable, validated and reproducible scoring system for facial aesthetics in cleft patients. Many template and lay panel scoring systems are described,

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yet never fully validated. Advanced 3D imaging technologies may produce validated outcome measures in the future, but presently there remains a need to develop a robust method of facial aesthetic evaluation based on standardised patient photographs. We make recommendations for the development of such a system.

Introduction

The face is central to many aspects of social interaction and symmetrical or 'average' faces are perceived as more attractive.[1] The facial asymmetry resulting from cleft lip and palate (CLP) causes significant emotional distress in childhood, adolescence and adulthood due to unhappiness with facial appearance, adversely affecting overall facial form or 'gestalt'.[2–4]

For CLP patients, there are internationally recognised and validated scoring systems for facial growth and speech outcomes. The Great Ormond Street, London and Oslo ('GOSLON') yardstick measure dental arch relationships and is an index to quality of facial growth.[5] It is also used in unilateral CLP patients after orthodontic treatment and secondary alveolar bone grafting.

For speech outcomes, the Great Ormond Street Speech Assessment ('GOS.SP.ASS.'98) is a well validated tool for quantifying speech assessments in CLP patients and is often used for research[6] whilst the Cleft Audit Protocol for Speech – Augmented ('CAPS-A'), allows speech and language therapists to compare speech outcomes for audit.[7] Together, both systems measure and allow comparison of speech outcomes, with advantages including ease of use, proven track record and high clinical relevance.

However, there is no agreed standard to evaluate aesthetic outcome in CLP patients. Any new method must be acceptable to patients and their parents, non-invasive, avoid ionising radiation, quick and cost-effective. This review critically appraises relevant systems currently available to assess facial aesthetics in cleft surgery and makes recommendations towards the development of a unified and internationally accepted method to address this significant problem in cleft care.

Methods

A literature search using PUBMED, MEDLINE and Google Scholar search engines was conducted using the following terms: 'face/facial', 'aesthetics/esthetics', 'cleft', 'lip', 'palate', 'surgery', 'evaluation' 'measure' and 'rating'. All methods of aesthetic evaluation for cleft lip and palate published between August 1980 and August 2010 were included. Only full articles published in English and in humans were used. This produced 53 articles, 40 of which were relevant. Those describing primary research are discussed in-depth and summarised in Table 1a–d. Four broad themes were identified: 'Direct Clinical Assessment', 'Clinical Photographic Evaluation', 'Clinical Videographic Assessment', and 'Three-dimensional Evaluation'. The remaining papers were used to provide useful background information. We have used the preferred reporting items for systematic reviews and meta-analyses checklist ('PRISMA statement') to ensure this review has developed along internationally recommended guidelines.[8]

Results

Direct clinical assessment

Direct, live assessment is the lynchpin of evaluation of patients by their surgeon. It allows rapid, global assessment in four-dimensions (i.e. views from all angles and in dynamic motion) and accurately evaluates complex clefts (Figure 1a).

Assuncao (1992) described a clinical classification based on 81 patients with unilateral CLP, separating the lip into 3 sections – the vermilion, lip, and scar, giving the 'V.L.S.' classification.[9,10] Although a simple and rapid technique, it was not further validated, only involved single author ratings, therefore inter-rater reliability could not be tested. There was no rationale describing why these anatomical areas are important in evaluating facial aesthetics, and views of nose and side profile not rated. Furthermore, there was no dynamic facial evaluation.

Farkas et al. (1993) analysed pre- and post-operative measurements of the nose in 254 CLP patients of Czech and North American descent using callipers.[11] They quantitatively demonstrated features of a cleft nose, providing longitudinal data that may help a cleft surgeon time their intervention. However, the groups were poorly matched – Czech group significantly younger (3–12 months old, 81 patients) than the North American group (6–29 years old, 173 patients), making direct comparisons difficult. There were also significant differences in types of surgical repair performed. Other confounders included 33% of the older cohort having secondary revision procedures before clinical evaluation. Furthermore, only anthropometric measurements were made with no discerning factors for outcome severity. Finally, there is no description of the rating panel, numbers or raters or their background. Therefore, there are multiple confounding variables and no way of demonstrating inter- and intra-rater agreement, to prove reliability and validity of this study.

Friede et al. (1980) took plaster casts of the mid-face, analysing angular, linear and surface measurements in 30 CLP patients, 4–10 years post-procedure.[12] This allowed objective quantification of dimensions of repair, but is unfeasible in a busy clinic setting. There is no description of the method of moulding, need for patient sedation, or