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A comparison of computer versus panel assessment of two groups of patients with cleft lip and palate

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SUMMARY. **A computer-based system of assessing asymmetry was used to compare standardised photographs of primarily corrected cleft noses, uncorrected cleft noses and control (normal) noses. A significant difference was found between control and cleft groups for both upper nasal perimeter ($p < 0.001$) and nostril outline ($p = 0.001$), and between uncorrected and corrected noses for upper nasal perimeter ($p = 0.03$) but not for nostril outline ($p = 0.99$).**

Comparing the results achieved by panel assessment (Cussons *et al.*, 1992) with this of the same patients revealed some discordance related to the influence of extraneous factors on panel decisions.

Panel assessment is needed in the evaluation of overall appearance, whilst the computer method is able to assess the results of different techniques, and from different centres, on specific features where symmetry is a major objective of surgical technique.

In order to be able to report objectively on the outcome of procedures to correct the cleft lip nose on large numbers of patients, it has been considered important to compare the strengths and weaknesses of panel assessment and computer based assessment of asymmetry. In this paper a group of normal subjects and two groups of cleft patients treated by different methods and assessed by these two methods will be presented.

Patients and methods

The technique of asymmetry assessment using the computer-based method previously described has been modified for the purpose of this study (Coghlan *et al.*, 1992). The principal modification consisted of excluding the ill defined "perimeter" between the alar bases (Fig. 1) by reflecting the upper nasal perimeter about a horizontal axis to provide a continuous figure required by the computer (Fig. 2). Since the nasal correction chiefly aims at balancing the alar domes and also bases the interalar segment is not relevant to the correction. 25 patients with unilateral bony complete cleft lip and palate having had radical primary nasal correction (RNC group), 22 similar patients having had no primary nasal correction (NNC group), and 15 controls were studied. Clinical details and selection criteria of the groups and panel assessments have been discussed in a preceding paper (Cussons *et al.*, 1992). The principles of the computer assessment of asymmetry detailed in the preceding paper depend on comparing the normal to the abnormal side (Coghlan *et al.*, 1992).

The "slope" measure (expressed in degrees of angle) has been used as an indicator of the extent of asymmetry.

Statistical methods

Sample means were compared using the Student's t test. Adequate significance level was considered to be equal to or less than $p = 0.05$. Simple regression analysis and Spearman rank correlation were used to assess the relationship between variables.

Results

Table 1 shows the slope values for the mirrored upper nasal perimeters. The control group is significantly less asymmetrical than both cleft groups. However, there is also a statistical difference ($p = 0.03$) between the RNC and NNC groups. In order to quantify the

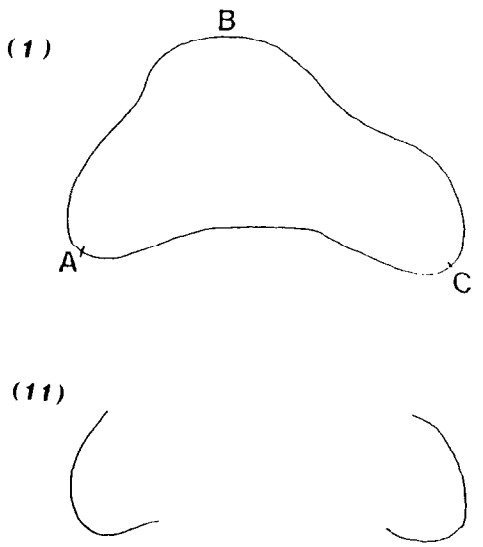

Fig. 1

Figure 1—View of the base of the nose. (i) Upper nasal perimeter A–B–C: interalar base A–C. (ii) Alar margin.

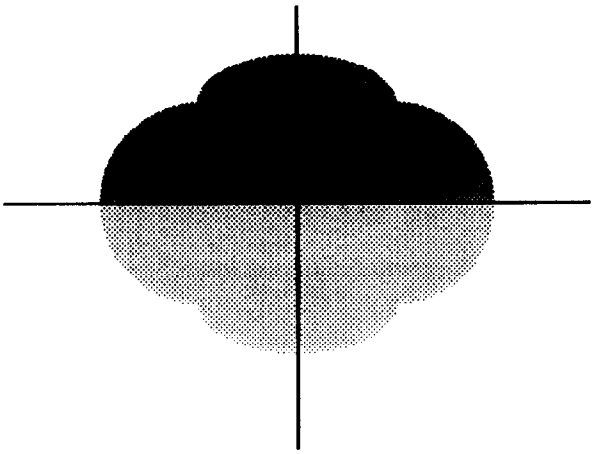

Fig. 2

Figure 2—The reflected upper nasal perimeter.

Table 1 Mirrored upper nasal perimeter

	n	*range*	*mean*	*SE*
Control	15	2.0–6.7	3.99	0.3
NNC	22	2.6–21.9	9.71	1.1
RNC	25	2.1–15.6	6.69	0.7

Slope (degrees)

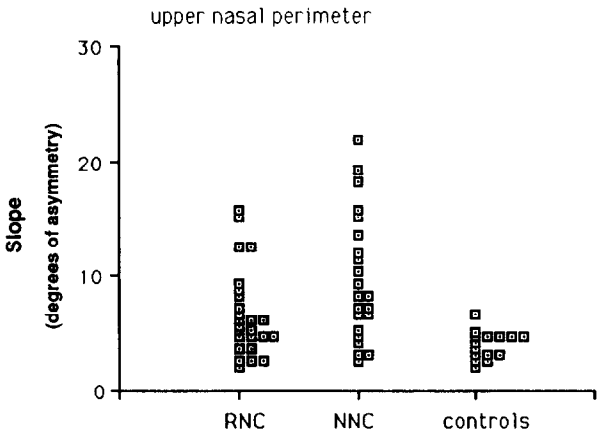

Fig. 3

Figure 3—Upper nasal perimeter asymmetry: the 3 groups compared. RNC, radical nasal correction. NNC, no nasal correction.

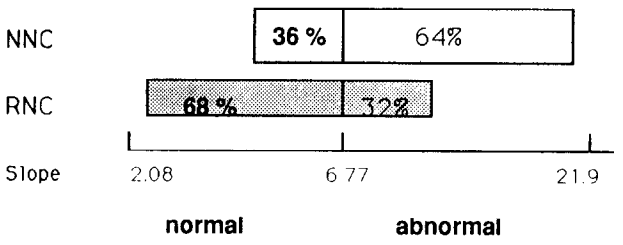

Fig. 4

Figure 4—Upper nasal perimeter: noses within normal range of symmetry.

amount of deviation from normal of both cleft groups, the difference between the individual slope values and the mean control value (3.99) has been used.

The mean deviation from normal (Fig. 4) of the RNC group (2.69) is half that of the NNC group

Table 2 Nostril outlines

	n	*range*	*mean*	*SE*
Control	15	4.7–21.3	9.9	1.1
NNC	22	4.7–36.9	19.4	1.6
RNC	25	6.2–34.9	19.4	1.6

Slope (degrees)

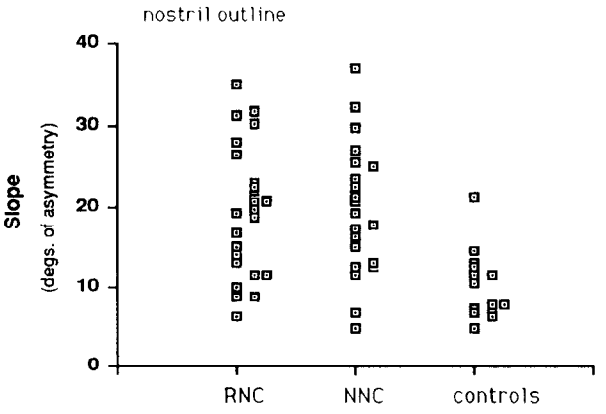

Fig. 5

Figure 5—Nostril outline: the 3 groups compared.

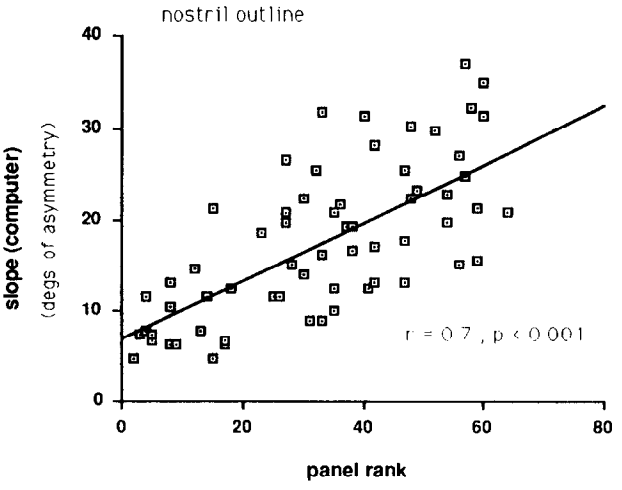

Fig. 6

Figure 6—Nostril outline: panel compared with computer assessment.

(6.22). Indeed, 68 % of the RNC upper nasal perimeter slope values were within the normal range of slope values (2.08–6.77) as derived from the control group compared with only 36% of the NNC upper nasal perimeter slope values.

The slope values of nostril outlines for the 3 groups are shown in Table 2. As expected, the control nostrils are significantly less asymmetrical than the two cleft groups ($p = 0.001$). However, there is no significant difference ($p = 0.99$) between the NNC and RNC groups in the degree of nostril asymmetry (Fig. 5).

When panel ranking is compared with computer assessment (Fig. 6), fairly consistent agreement for the 62 pairs of nostrils as a whole can be seen ($r = 0.7$; $p < 0.001$). As for the upper nasal perimeter (Fig. 7), there is also significant agreement between panel and computer ranking although the correlation is some-

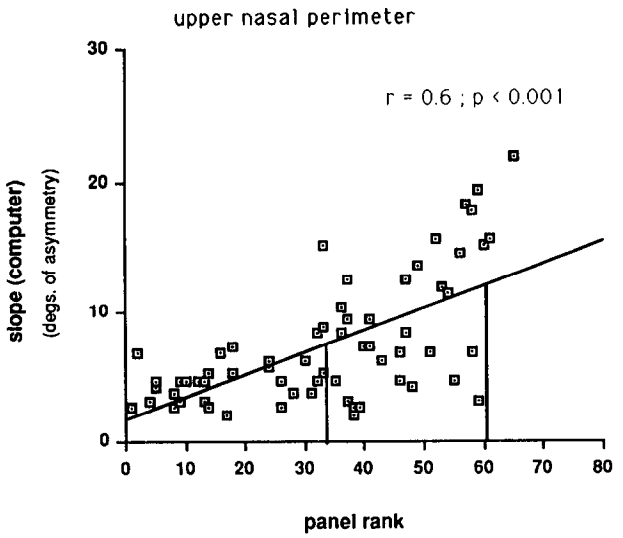

Fig. 7

Figure 7—Upper nasal perimeter: panel compared with computer assessment. Cases with good computer but poor panel ranking are within the area delineated by the vertical bars.

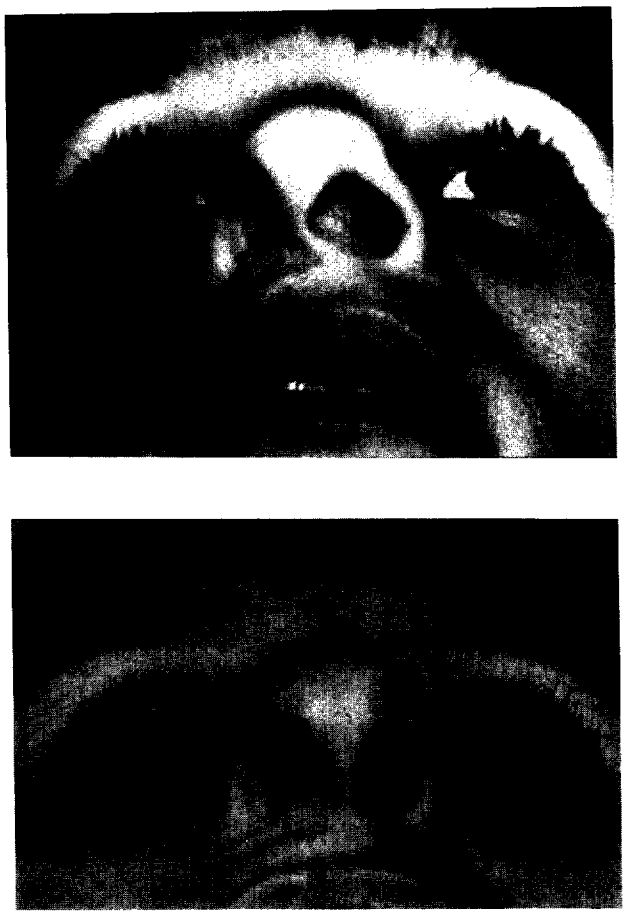

Fig. 8

Figure 8—The effect of septal deviation on nostril symmetry: before and after septal correction.

what less than that for nostrils ($r = 0.6$; $p < 0.001$). This is due to a group of 16 patients—10 NNC and 6 RNC—who have good computer but poor panel ranking (Fig. 7). These patients appear to have poor looking nostrils which detract from the symmetry of the upper nasal perimeter (Fig. 8a).

Fig. 9

Figure 9—(A) Effect of asymmetrical nostril outline on subjective assessment of upper nasal perimeter. (B) Assessment of upper nasal perimeter after blocking view of nostrils.

Discussion

In contrast to a panel method, quantification of the degree of asymmetry (using the slope value expressed in degrees of angle) by the computer method is possible so that deviation from a normal standard can be assessed objectively. This study has, indirectly, validated the use of the slope value as a measure of asymmetry since control noses have consistently lower mean values than cleft ones for both upper nasal perimeter and nostril outline.

Simultaneous primary correct of the unilateral cleft lip and nose remains a matter of controversy (McComb, 1975). Anderl (1985) stressed the importance of "comparison of right and left sides of the nose and shape of the nostrils". Both this study and the parallel panel assessment have been able to distinguish a difference between children undergoing early correction, those who have not and of both groups from normal children and supports the view that this effect persists into the early adolescent period (McComb, 1985).

Of interest is the fact that 36% of the no nasal correction group have a slope value within normal range, suggesting that not all complete unilateral cleft noses require correction. Pigott (1988) observed a difference in unoperated dome form in bilateral clefts. Closer observation of unilateral cases may reveal the same differences and allow surgeons to select cases for

primary correction. If only these "no nasal correction" cases were to have been assembled in one paper, a "good case" could have been made for never correcting the nose.

The question of whether early nasal correction is ultimately better for patients than late nasal correction will require repetition of the study after the "no nasal correction" patients have undergone correction. The outcome will also need to take into account the overall morbidity of the two philosophies, for example, secondary problems such as nostril stenosis (Tan, 1992) and the psychological benefits of early versus late correction.

The "leapfrog" technique (Pigott, 1985) aims to lift the dropped "visor" of the alar cartilage hoop, so that the rims of the nostrils are level when seen in the front view. This manoeuvre cannot be assessed in the base view chosen for this study. Perhaps more importantly it also aims to advance the slumped alar dome on the cleft side to balance non-cleft side. It is this aspect of the nose tip that is demonstrated by the upper nasal perimeter.

On the other hand, this technique does not include primary correction of nasal septal deviation and so does not address the problem of nostril asymmetry, which to a large extent is due to the presence of a deviated septum and is resolved by correction of this deviation (Fig. 8). It is not surprising, therefore, that both the Radical Nasal Correction and the No Nasal Correction groups have similar degrees of nostril asymmetry.

There is some discrepancy between computer and panel ranking in the assessment of the upper nasal perimeter. This may be because subjective assessment of this outline is made difficult by extraneous factors like shape of the lip itself, the position of the septum, or even the appearance of the nostrils. Removing such distractions by, for instance, blocking the view of asymmetric nostrils will lead to a more accurate assessment of the upper nasal perimeter (Fig. 9).

It may be interesting to repeat the panel assessment by presenting to the panel the same upper nasal perimeter tracings as were assessed by the computer to see whether an improved correlation between panel and computer methods can be achieved. This study will be extended to examine the front view of the nose using the reflection principle described by Lestrel *et al.* (1977) for the upper surface of the femur. The technique can also be applied to assess the symmetry of lip repair.

With the use of standard photography, both panel and computer based ranking of symmetry are possible.

There is little doubt that the computer method provides a more objective assessment of asymmetry than a panel, which is subject to bias. It is ideally suited for retrospective analysis of photographic material so long as some care with standardisation has been taken. With the computer method it is possible to handle larger numbers of patients thereby increasing the probability that the sample is representative, and to assign a number to the degree of asymmetry. It is, nevertheless, not designed to evaluate overall aesthetic appearance, which is the domain of panel assessment. The greatest potential of the computer method, however, is its ability to assess the results of nasal correction for large numbers of patients treated by different techniques and from different centres. This cannot be done by panel ranking since the entire ranking process would need to be repeated on each occasion.

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