THE PURSUIT OF SYMMETRY IN CRANIO-FACIAL SURGERY

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The introduction of cranio-facial surgery has enabled a number of hideous facial deformities to be corrected but at the same time new problems have been created and not all the old ones solved. The problems created by cranio-facial surgery are such secondary deformities as enophthalmos and lagophthalmos, ptosis and canthal drift. The problems unsolved by cranio-facial surgery, although it has made their solution possible, are as old as plastic surgery itself: reconstruction of a severely deformed nose.

These problems are particularly difficult when the deformity is asymmetrical; the following 4 cases illustrate some of them and the means used to try to solve them.

Case 1. When this girl was born in the Caribbean with severe unilateral hypertelorism, a frontonasal cleft with a proboscis, lagophthalmos and deformities of the maxilla (Fig. 1), the physician advised the family to let her die. As a young child she was operated on by a visiting plastic surgeon. When I first saw her, she was 10 years old, very shy but of normal intelligence and speaking 4 languages (Fig. 2). At operation the late Dr J. Rage and I reduced the interorbital space by 3.5 cm. Both orbits were moved, the left being extremely hypoplastic. Only partial correction was obtained. Shifting the orbits did not improve the severe lagophthalmos and full thickness skin grafts in the upper and lower eyelids were needed to make closure possible. In addition the canthopexy failed because of the egg-shell fragility of the medial orbital wall which broke into several fragments. Reconstruction of the nose was therefore limited to lengthening the deformed half by introducing the surplus skin.

In retrospect the result of this major operation was not satisfactory because of the severe telecanthus, the remaining lagophthalmos and the residual nose deformity (Fig. 3).

Some time later, after her return to Curacao, an attempt was made to reconstruct the left nostril using a bipartite transposition flap (Fig. 4). Correction of the telecanthus had to be postponed until the next visit to the Netherlands when she was 14. The left orbital region was again explored. The remnants of the medial orbital wall, the superior rim and the lateral wall had all moved out of position: the medial wall laterally, the rim and the lateral wall backwards. The nasal skeleton was virtually absent. Correction consisted of the following:

- Advancement of the lateral wall and augmentation of the superior rim with bone grafts;
- Removal of the remnants of the medial wall and the septum followed by reconstruction of the nasal skeleton with 3 bone grafts: a thin-shaped cortical bone graft taken from the inner table of the iliac crest and 2 cancellous grafts to replace the medial wall of the orbit, all held in place by a transnasal canthopexy;
- Remodelling of the left nostril by V-Y advancement.

This operation improved her appearance but she still had undue prominence of the upper part of the nasal bridge, contraction of the left nostril, canthal drift, rotation of the left eyebrow, and, surprisingly, eyelids which now did not open.

Further reconstruction of the nose took place 2 weeks later. The remaining contracture in the left nostril was opened with a Z-plasty and the new nasal septum which had revascularised well was reduced. This left the deformities in the orbital region. At our wits’ end we tried to correct them by medial rotation of the upper eyelid and brow and by removal of the skin graft in the lower eyelid. As a result the girl is again able to open her eye although some ptosis remains (Fig. 5). Definite improvement of the canthal drift was obtained. Her jaw deformities have still to be corrected (Fig. 6).
Case 2. This boy was born with a severe right facial deformity consisting of hypertelorism, enophthalmos, ptosis, nasal hypoplasia and maxillary and mandibular deformities. He was referred when 10 years old after an extra-cranial attempt to correct the deformity had proved unsuccessful (Fig. 7). His right nostril contained a composite graft which stood out like a red flag.

The interorbital distance was reduced by 3 cm. Both orbits were moved and a chronic dacrocystitis was corrected by a cystorhinostomy.

Postoperatively some telecanthus remained which was accentuated by the absence of a nasal bridge. Partial improvement was obtained by a keel-shaped bone graft to reconstruct the nasal bridge and by excision of the fibrous substratum in the upper inner canthal region. The levator palpebrae was shortened to correct the ptosis and a second composite graft was added to the nostril. This graft failed, leaving us with the problem of giving form to the hypoplastic nostril. In the end skin was added in much the same manner as in the previous case. A transposition flap was used and the raw area which it left was closed with a full thickness graft. This procedure gave contour to the nose but the texture and colour of the full thickness and composite grafts remained conspicuous. They were therefore removed; the full thickness graft was replaced by a transposed median forehead flap and the composite graft by
FIG. 4. Case 1. The bilobed flap used to reconstruct the left nostril. Also shown is the eyebrow rotation and Z-plasty, and full thickness grafts to the lower eyelid used in Case 4.


FIG. 6. Case 1. Jaw deformity still to be corrected.
advancement of the transposition flap. The nasal shape is now definitely improved, leaving the enophthalmos and maxillary and mandibular deformities still to be corrected (Fig 8).

Case 3. Rosasco and Massa (1968) published the appearance of this girl at birth which was rather similar to that of Case 1. They repaired the left side of the nose with a local flap while she was 4 days old and lengthened it further by a Z-plasty at 14 months (their figures 6-10). When referred at age 13 she still had an extreme asymmetrical hypertelorism. The homolateral half of the nose was virtually non-existent (Fig. 9). She was very intelligent, a voracious reader and like the first girl extremely shy.

At operation the interorbital distance was reduced by 3.5 cm. Both orbits were moved. Reconstruction of the nose offered few problems due to the surplus skin and mucosa. A

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Fig. 7. Case 2. Preoperative.

Fig. 8. Case 2. Postoperative.

Fig. 9. Case 3. Preoperative.

Fig. 10. Case 3. Postoperative.
bipartite transposition flap was used to rebuild the nostril and a keel-shaped bone graft to give contour to the bridge.

Postoperatively there was again some canthal drift despite a canthopexy with a temporary transnasal pressure fixation of skin and nasal skeleton. As in the previous case we were able to improve the drift by raising the nasal bridge with another bone graft. In addition, as much as possible of the fibrous tissue which prevented the skin from becoming fixed to the skeleton was removed. Her appearance is definitely improved although some telecanthus remains (Fig. 10).

**Case 4.** This 28-year-old man was born with an extreme left unilateral hypertelorism associated with a frontal defect. The left orbit was hypoplastic and the palpebral fissure greatly increased in length. The overall mobility of the left eye was limited and there was a divergent and upward squint.

Besides absence of the left eyebrow there was a marked lagophthalmos and the nose was deviated to the right with hypoplasia of the left side (Fig. 11).

Although he had a low I.Q., drank heavily and was mentally unstable, we considered it worthwhile to try and improve the deformity.

His hypertelorism was corrected by reduction of the interorbital distance by 2.5 cm; only the left orbit was moved. The immediate postoperative result was even more disappointing than in the previous cases. There was some canthal drift. The upper eyelid completely covered the eyeball which was now in normal position, the lower eyelid showed the oedematous conjunctiva and the palpebral fissure remained as long as ever.

Secondary correction was attempted as follows:

The redundant subcutaneous tissue in the upper inner canthal region was removed and the skin fixed to the bone by transnasal wiring;

The length of the palpebral fissure was reduced by 1.5 cm;

A full thickness graft was added to reduce the tension on the upper and lower eyelids (Fig. 4);

**Fig. 11.** Case 4. Preoperative,

**Fig. 12.** Case 4. Postoperative.
The eyebrow was reconstructed with a frontal flap.
The nasal asymmetry was corrected by lengthening the left and shortening the right half of the nose (Z and V-Y). Definite improvement was obtained (Fig. 12) but postoperatively some enophthalmos became apparent.

According to the ophthalmologist, binocular vision must have been present in early childhood, through a compensating torticollis, but now could only be sustained for very short periods with intense concentration.

**Fig. 13.** A midline "faciotomy" to correct both orbital and maxillary deformities.

**DISCUSSION**

The commonest postoperative complication in this series was canthal drift and in my opinion this is not due to stretching of the canthal ligaments. With the exception of the first case the canthus was firmly secured by a transnasal suture tied over a pad pressing the skin against the nose. It seems more likely that the flattening of the upper inner canthal region which in my opinion is responsible for the remaining deformity, is caused by insufficient fixation of the skin to the underlying skeleton and that the resulting drift is worsened by continuous traction of the soft tissues laterally. Improvement may be achieved by resection of as much subcutaneous tissue in the upper inner canthal region as possible and release of all lateral traction by rotation of the eyebrow and supplementation of skin shortage with full thickness grafts.

All of the craniofacial deformities described were associated with deformities of the upper jaw, caused apparently by a growth arrest in the craniocaudal axis of the face. It is suggested that in the future all these skeletal deformities should be corrected in one operation by a combination of orbital and maxillary osteotomies (Fig. 13). In other words a midline "faciotomy".

Most of the problems posed by such asymmetrical deformities however are highly
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individual and unsuitable for generalisation; they will continue to tax the ingenuity of
the craniofacial surgeon.

REFERENCE

Surgery*, 21, 244.