Surgery of the cleft lip and nose – the GOSTA approach

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Key-words. Cleft lip; cleft nose; vomerine flap

Abstract. Surgery of the cleft lip and nose – the GOSTA approach. The technique for primary correction of the cleft lip and nose, as practised by The North Thames Cleft Lip and Palate Centre at Great Ormond Street Hospital/St Andrew’s Centre (GOSTA) has evolved over 28 years of personal experience. It is an amalgamation of techniques developed by many others with some personal modifications. Patients are routinely audited at 5, 10, 15 and 20 years and outcomes evaluated and compared with other centres where possible. Secondary surgery of lip and nose is based on the same principles of anatomical reconstruction used in the primary surgery.

Introduction

The technique developed by the author has been based on the work and reported outcomes of many others, with some personal modifications.

The protocol has evolved in small ways over a period of 28 years, with the only major change being the introduction of one-layered vomerine flap closure of the anterior hard palate at the time of lip repair in 1993.

The lip and palate must be viewed together as the management of each influences the other.

Evaluation of outcomes must be critical and based on regular audit of all patients.

Protocol

Presurgical orthopaedics

The GOSTA team routinely employed presurgical orthopaedics (PSO) in complete unilateral clefts but having submitted PSO to trials we have come to the conclusion at present that there is no demonstrable benefit, despite the fact that the surgeon may feel that PSO helps. The PSO technique used involved an active plate and gentle strapping. However, in bilateral cleft lip and palate patients with a prominent premaxilla, presurgical orthopaedics is still employed with a plate to prevent collapse of the lesser segments (and expansion if necessary) and gentle strapping to push the premaxilla back.

Timing

The lip is routinely repaired at the age of 3 months unless there are contra-indications. If associated with cleft palate the remainder of the palate is usually repaired at the age of six months.

Surgical technique

The current technique for repair of lip and nose in a patient with a unilateral cleft involves:

- Single-layer vomerine flap closure of the anterior palate: the flap is double-breasted under the oral mucoperiosteum of the lesser segment.
- Subperiosteal dissection over the anterior maxilla and lateral nasal wall with incision and release of the anterior maxillary periosteum and division, if necessary, of the lateral nasal lining about 1 cm behind the piriform aperture.
- Radical dissection of the lip and paranasal musculature. Both the lateral and medial musculature are separated from skin and underlying mucosa and rotated downwards. The reconstruction is completed by overlapping the lateral muscle over the medial, using non-absorbable sutures.
- Radical nasal correction. Skin is separated from the underlying alar cartilages from both medially and laterally but without any additional intranasal incisions. Correction is maintained by a modification of the McComb technique with buried suspension sutures. No surgery is carried out at this stage to the cartilaginous septum as the deformity is the result of displacement of the base of the septum with the midline of the premaxilla.
• The alveolus is not reconstructed but left until later alveolar bone grafting. However, the nasal floor is closed in continuity with the vomerine flap closure of the anterior palate.

• The skin incision involves a modified Millard technique with a small additional triangular flap (Tennison-Randall).

The major modifications in the bilateral cleft lip and palate are as follows:

• Full vomerine flap closure of the anterior hard palate is limited to one side only because of fear of damage to the blood supply of premaxilla and prolabium if radically performed bilaterally. Limited closure on the contralateral side may be possible.

• Primary muscle repair is performed if it is felt that it can be done without excessive tension. If not possible, the full radical mobilisation of the lateral segments is performed, the prolabium may or may not be narrowed and muscle sutures do not appose the muscle ends but simply support them. At a further procedure at approximately the age of 12 months, the prolabium is re-raised, narrowed if necessary and the muscle dissected and united.

• The decision whether to reconstruct central mucosa with prolabial mucosa (Manchester) or lateral mucosa (Millard/Mulliken) is made for each case, depending on the quality of the prolabial mucosa and the extent and definition of the white line of the lateral segments and prolabium.

The technique is modified in incomplete cleft lips, depending on severity:

• Periosteal dissection of the anterior maxilla is performed if there is significant retro-displacement of the anterior maxilla on the cleft side, but may be possible without a buccal sulcus mucosal incision. The periosteum of the nasal floor is elevated in continuity if the nasal floor is depressed.

• In some very minor cases, full muscle reconstruction and/or nasal correction are not necessary but, in general, results appear to be better with more radical dissection.

Secondary surgery to lip and nose may be necessary because of:

i. Inadequate primary correction
ii. Changes resulting from growth
iii. Changes produced by surgery

The principles are:

• “Keeping it simple” and minimising complicated flaps within flaps.

• Basically correcting the uncorrected anatomical abnormality.

• Adequate visualisation of the deformity. For the nose, this usually means an open technique.

• If patients express concern about the lip it is often in fact maxillary retrusion to which they are referring. This needs to be addressed before lip and/or nasal surgery.

Outcomes

Regular audit of outcomes has shown that the final result cannot be assessed until the age of 20 years.

Maxillary growth and dental arch relationship

Maxillary growth and dental arch relationship tends to become less satisfactory with time, particularly as a result of mandibular growth. A blind assessment of arch relationship using the GOSLON score
system, performed on patients operated on before the introduction of the vomerine flap technique, showed favourable growth outcomes compared with the six Eurocleft centres. A more recent comparison of 5 year index scores of patients immediately before and after the introduction of the vomerine flap suggests that this does not make the arch relationship worse and appears to reduce lateral crossbite.

Speech

Speech also changes with time. Velopharyngeal incompetence may develop late, presumably as a result of adenoid shrinkage and changes in pharyngeal shape and configuration. The technique of radical muscle repair, with radical reconstruction of the soft palate performed under the operating microscope since 1991, appears to produce very favourable velopharyngeal outcomes compared with published data. Secondary surgery (pharyngoplasty or palate re-repair) rates are about 5% at 10 years.

Aesthetic assessment

Aesthetic assessment is very difficult to quantify. Lip appearance and function is generally good, requiring few revisions and with excision of mucosal excess being the most common. Most patients with complete clefts would or have benefited from secondary rhinoplasty at maturity (see Figure 1).

Patient satisfaction and psychological adjustment

Patient satisfaction and psychological adjustment is relatively unrelated to objective assessment of outcome. Some of the patients with the best results as measured by objective criteria are the least happy with their outcomes and vice versa.

Discussion

The protocol described involves early primary surgery with radical reconstruction of the anatomy followed by minimal further surgical intervention (apart from alveolar bone grafting at the age of 8 to 10 years and probable rhinoplasty). The aim is to minimise the burden of care while attempting to optimise outcome. Comparison with other protocols is very difficult. All aspects of outcome must be assessed. It does seem possible to produce a good outcome as far as speech, maxillary growth and aesthetic outcome are concerned.

Conclusion

Ultimately, the aim is a well-adjusted, well-integrated individual with as close to normal anatomy and function as possible.

References


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