

The midfacial degloving approach to sinonasal tumours in children*

N.N. Eze, M.E. Wyatt, D. Bray, C.M. Bailey, B.E.J. Hartley

Great Ormond Street Hospital for Children, Great Ormond Street, London WC1N 3JH, United Kingdom

SUMMARY

The midfacial degloving approach was originally described by Denker and Kahler in 1926 [1] but has been little used in the paediatric population. The procedure allows access to benign and malignant lesions of the sinonasal region with the avoidance of an external scar. The advantages and application of this technique are presented in 9 paediatric patients, ranging from 3 months to 15 years of age with a mean follow-up of 7 months. Eight children had benign pathology. There were two juvenile angiofibromas, two nasal gliomas, one ossifying fibroma, one fibroma, one fibrous dysplasia and one benign myofibroblastic proliferation. One child had malignant disease in the form of recurrent embryonal rhabdomyosarcoma. All had excellent cosmetic results and no complications were encountered during follow-up.

Key words: paranasal sinuses, children, surgical approach, tumour

INTRODUCTION

The traditional method of surgical access to the midfacial structures for the removal of benign and malignant lesions has been through external facial incisions or via the paranasal sinus or transpalatine routes [2]. External approaches such as the Weber-Ferguson and lateral rhinotomy leave unattractive scars in the midface, and the sublabial incision gives limited exposure. Access can be improved by extending the sublabial incision with the modified Caldwell-Luc approach. An intra-oral incision on the palate with sub-periosteal elevation will give an inferior route to the nose [3]. All these established approaches limit exposure as a result of their unilaterality. In 1974, Casson [4] modified Converse's [3] approach with bilateral exposure and elevation of the external nasal tissues via intercartilaginous and transfixion incisions, allowing mobilisation of

the soft tissues to reveal the mid-facial structures. This is termed the midfacial degloving procedure.

MATERIALS AND METHODS

The midfacial degloving approach has been used in our specialist tertiary referral centre for the treatment of 9 children in the last 2 years. The technique has been utilised for both benign and malignant conditions affecting the nose, paranasal sinuses, and nasopharynx (Table 1, Figure 1)

A retrospective case notes review was performed for 9 children who had undergone the midfacial degloving approach for

Table 1. The pathological diagnosis, site of lesion and patient demographics.

	Pathology	Anatomical area	Age	Sex
1	Benign Myofibroblastic Proliferation	Left maxilla	14 months	M
2	Recurrent Rhabdomyosarcoma	Infratemporal fossa and posterior maxilla	4 years	M
3	Angiofibroma	Left maxilla	15 months	M
4	Angiofibroma	Nasopharynx	14 years	M
5	Ossifying Fibroma	Left maxilla	7 years	F
6	Nasal Glioma	Left nasal cavity	3 months	M
7	Nasal Glioma	Left nasal cavity	2 years	F
8	Fibrous Dysplasia	Left maxilla	4 years	F
9	Fibroma	Left nasal cavity	15 years	F



Figure 1. Coronal CT showing large ossifying fibroma filling the left maxillary sinus and nasal cavity (case 5).

*Received for publication: July 13, 2004; accepted: May 11, 2005

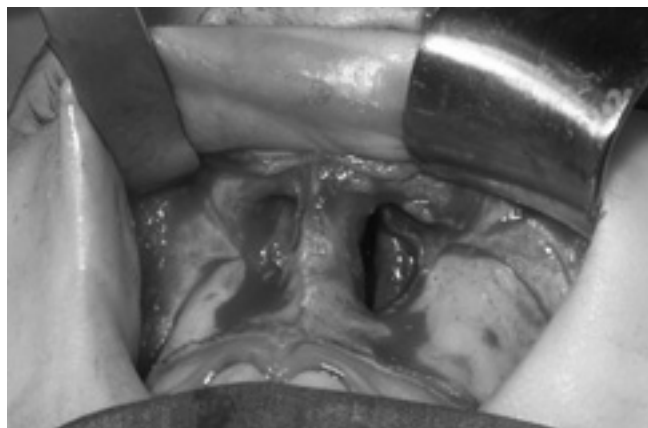


Figure 2. Intra-operative photograph after excision of anterior maxillary wall and removal of ossifying fibroma from maxillary sinus (case 5).

sinonasal tumours over a 2 year period. Demographic data, indications, results and complications were noted.

Surgical Technique

The procedure used was as described by Maniglia et al. [2] and by Howard and Lund [5].

The operation is carried out under general anaesthesia with oral intubation. The hypopharynx is packed with gauze and temporary tarsorrhaphies are performed for eye protection. One % lignocaine with 1:200,000 adrenaline is infiltrated into the upper buccogingival sulcus prior to making bilateral sublabial incisions which join in the mid-line. Elevation of the maxillary periosteum and the soft tissues of the cheek allow exposure and preservation of the infra-orbital nerves. In order to access the maxillary sinus, the anterior maxillary wall may be removed and replaced later as an osteoplastic flap (Figure 2). Bilateral intercartilaginous incisions between the upper and lower lateral cartilages are then made, with full transfixion between the septum and columella. These incisions are extended in order to meet across the floor of the nose permitting elevation of the soft tissues of the dorsum of the nose. Finally bilateral pyriform aperture incisions are performed to

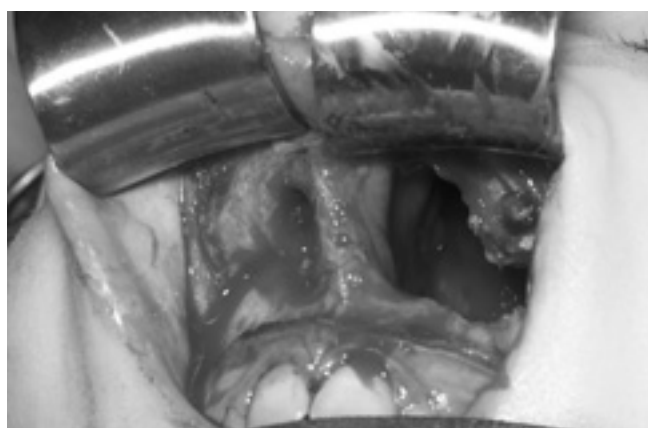


Figure 3. Intra-operative photograph showing closure of the bilateral sublabial incisions (case 5).

allow the skin and soft tissues of the middle third of the face to be degloved completely. This allows access to the nasal cavities, maxillary, sphenoid and ethmoid sinuses, the infratemporal and pterygopalatine fossae and nasopharynx [5]. In some cases, the microscope was used as an additional visual tool.

After clearance of the lesion, haemostasis is achieved by packing Whitehead's varnish gauze (Whitehead's varnish: iodoform, benzoin, prepared storax, tolu balsam, and solvent ether) into the formed cavity: this pack is removed under general anaesthesia seven days later. Interrupted absorbable sutures are used to close the transfixion and sublabial incisions (Figure 3).

RESULTS

For the past 2 years this technique has been used in 9 children ranging in age from 3 months to 15 years (mean age 5 years). The male to female ratio was 5:4. The varying pathologies and ages are demonstrated in Table 1. In all cases adequate surgical exposure was achieved and surgical excision was macroscopically complete. In no case was an additional external incision required to complete the procedure.

Follow-up was from 1 month to 2 years (mean 7 months). There were no complications encountered during this period of follow-up. No recurrence has yet been identified and revision surgery was not required in any of the cases.

DISCUSSION

The midfacial degloving approach is an established procedure in otolaryngology but it has not yet achieved widespread popularity despite the potential for excellent bilateral exposure of the nasal cavity, middle third of the face and central skull base. These areas are all accessible with the Weber-Ferguson and lateral rhinotomy approaches but these carry clear cosmetic disadvantages, particularly in the young. The midfacial degloving procedure provides better access to the lateral sphenopalatine and infratemporal fossae. There is also potential for easy extension and modification of the midfacial degloving technique [6].

The endonasal, endoscopic or microscopic approach in conjunction with a medial maxillectomy may be used as an alternative [7]. In order to gain full clearance, an open approach may still be required and patients are consented for this possibility. The Caldwell Luc approach is preferable for limited maxillary sinus tumours but the midfacial degloving gives wider access for more extensive lesions particularly involving the posterior and superior aspects of the cavity.

Indications for use of midfacial degloving include benign and malignant sinonasal pathology, but the latter should only be attempted in selected cases in which full clearance would be achieved. This approach should be considered for lesions which are felt too extensive for the Caldwell-Luc and inaccessible for an endoscopic approach. External approaches such as

the Weber-Ferguson and lateral rhinotomy allow good access but leave unattractive scars in the midface.

Limitations of the technique include the duration of the procedure and the reduced access to the frontal sinus and anterior skull base which may necessitate a coronal flap. In one case in this series, it was necessary to remove an upper left permanent canine developing within the maxilla in order to gain adequate exposure: this tooth was likely to be destroyed by the underlying disease process and was sacrificed for access. Temporary removal of the anterior maxillary wall and replacement at the end of the procedure as an osteoplastic flap may reduce the possibility of postoperative deformity.

There is limited data on the use of this approach in children as concerns have arisen regarding the effects of radical surgery on midfacial development [5]. No cosmetic deformities occurred relating to midfacial development in this series during our limited period of follow-up (Figure 4). An ideal follow-up period would be at least 15 years. Our results concur with those produced by Conley et al. [8] who followed up babies and children for 10 years and demonstrated no facial growth disturbances. There has been anxiety regarding the effect of radical surgery on midfacial development in children under the age of 2 years. These concerns have been deemed to be unfounded. Results from continuing studies assessing standardised sequential photographs and lateral cephalometry on children undergoing radical sinonasal surgery with various approaches, show no evidence of abnormal midfacial growth particularly if the hard palate, cartilaginous septum and upper lateral cartilages are undisturbed [9].

All 9 children had sinonasal tumours that without surgery would have resulted in severe and progressive facial deformity. It is therefore important to appreciate that concerns about facial growth related to the surgical approach, although a consideration, may be less important than the potential effects of the disease.

Complications cited in other series of adult patients include epiphora, oro-antral fistula, and septal perforations. None of these were encountered in our series.



Figure 4. Post-operative photograph after 1 week (case 5).

REFERENCES

1. Denker A, Kahler O (1926) *Handbuch der Hals-Nassen-Obren-Heikunde*. Berlin, Springer.
2. Maniglia A (1986) Indications and techniques of midfacial degloving. *Archives of Otolaryngology Head and Neck Surgery* 112: 750-752.
3. Converse J (1950) Restoration of facial contour by bone grafts introduced through the oral cavity. *Plastic Reconstr Surg* 6: 295.
4. Casson PR, Bonanno PC, Converse JM (1974) The midface degloving procedure. *Plast Reconstr Surg* 53: 102-103.
5. Howard D, Lund V (1992) The midfacial degloving approach to sinonasal disease. *J Laryngol Otol* 106: 1059-1062.
6. Howard D, Lund V (1999) The role of midfacial degloving in modern rhinological practice. *J Laryngol Otol* 113: 885-887.
7. Pasquini E, Sciarretta V, Frank G et al. (2004) Endoscopic treatment of benign tumours of the nose and paranasal sinuses. *Otolaryngol Head Neck Surg* 131: 180-186.
8. Conley J, Price J (1979) Sublabial approach the nasal cavity and nasopharyngeal cavities. *Am J Surg* 38: 615-618.
9. Lund VJ, Neijens HJ, Clement PA, Lusk R, Stammberger H (1995) The treatment of chronic sinusitis: A controversial issue. *Int J Pediatr Otorhinolaryngol* 32(Suppl): S21-35.

Miss Nneka Eze
 Department of Otolaryngology
 1st Floor Lanesborough Wing
 St George's Hospital
 Blackshaw Rd
 London SW17 0QT
 United Kingdom

Tel: +44-20-8725-2050
 Fax: +44-20-8725-3306
 E-mail: nnekaeze@yahoo.co.uk