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Total rhinectomy – a worthwhile operation?

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SINCE it is the most prominent and noticeable feature of facial appearance, loss of the nose carries with it considerable social and psychological penalties. Long before the birth of Christ, amputation of the nose was used as punishment for a wide variety of crimes, since it combined low morbidity with high noticeability!

Apart from occasional instances of severe facial trauma, and loss from syphilis or leprosy, surgical rhinectomy is now reserved for patients with extensive tumours involving the nasal framework. Although the actual operation is uncomplicated and the missing organ can be replaced with a socially acceptable prosthesis, it is mutilating and emotionally traumatic. Within the years 1965–1980 I have carried out total rhinectomy on 14 occasions. The time appears ripe for reappraisal of the long-term value of this procedure, with particular reference to individual patients.

Nasal Amputations Throughout the Ages

If punishment for real or imagined crimes is to serve as a warning to others, then it must be permanently visible and leave the victim alive. Loss of nose, eye and limbs has enjoyed popularity in all cultures since earliest times. A brief résumé of the history of nasal amputation is of interest since it was largely responsible for the initiation of the art of rhinoplasty. It also serves to remind us that 'punishment rarely fitted the crime'!

Although plastic reconstruction of the nose may have been performed in Egypt some 2500 years BC, the use of cheek flaps for reconstruction is recorded in the Sushruta Samhita, part of the four ancient Indian sacred books of knowledge (Vedas) in 600 BC. The operation was carried out by members of a caste of potters or tile makers, called Commas. It was apparently quite popular, since removal of the nasal tip was an accepted punishment for adultery! Whether there was sex discrimination in deciding punishment is unclear.

In Rome, within the first century, it was the cuckold who was allowed the doubtful privilege of removing the lover's nose. However, Canute (*c.* 1035), obviously an early chauvinist, amputated the adulteress's nose and ears but banished the guilty man! Nasal deformities are vividly described in the most famous of all post-biblical literature—the Talmud. This compilation of rabbinical discussions covers almost 800 years and, although the Greek version of the Old Testament translates the Hebrew word harum as

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'disfigured nose', the Talmud interprets it as '. . . possessing no nose'. In fact, for most of recorded history, prisoners and criminals have been punished by the slitting or amputation of the nose: 'They shall take away thy nose and they ears; and thy remnant shall fall by the sword' (Ezekiel, Ch. 23, verse 25) (Rosen, 1971). Even religious leaders such as Pope Gregory V (997) removed the eyes and nose of the anti-Pope Filogato. Louis IX (1215–1270) punished blasphemers by suturing the lips and removing the nose, whilst an unfortunate citizen at the time of Francisco I (1494–1547) who dropped a statue of a saint had amputated arms and nose before being slowly burnt. Queen Isabel (1558–1603) burnt the nose of thieves with a candle whilst Isabel Petrovna (1709–1762), Queen of Russia, removed the nose and ears of two noble ladies of her court who were considered as rivals in beauty (de Aguiar, 1958)! Even innocence was no protection and Fabricius tells how a modest and pious maiden, Susanna, fell into the hands of the soldiers when the Duke of Savoy waged war against Geneva in 1590—they cut off her nose, but this was later reconstructed by John Griffonicus, an ingenious surgeon of Lausanne. Probably the most noted of amputations in more recent times was that recorded by 'B.L.' (a Mr. Lucas) in *Gentleman's Magazine*, London, October 1794. 'Cowasfee, a Mahratta bullock-driver with the British Army in the war of 1792 was made a prisoner by Tippoo Sultan who cut off one hand and his nose.' A year later the nose was reconstructed by a man of the Brickmaker caste near Poonah. The reconstruction was witnessed by two Bombay doctors who, apparently greatly impressed, reported it in the *Madras Gazette* in 1793. It is often suggested that this case, employing techniques probably used in India for almost 2000 years, stimulated European surgeons to develop modern techniques of soft-tissue reconstruction.

Nasal Prostheses

Indians, with cheek and later forehead flaps, pioneered nasal reconstruction, followed in the fifteenth century by the Italian Vicenzo Vianeo, and a century late Tagliocozzi, using distant flaps from the arm. Such operations were difficult, time-consuming and usually cosmetically unsatisfactory (Landazuri, 1962). It was hardly surprising that less unpleasant alternatives were sought. The bloodthirsty Emperor Justinian II, nicknamed Rhinometus, had a golden nose in place of the nose cut off by his general, Leontius. It was said that when Justinian cleaned his golden nose somebody would die! Ambroise Paré (1510–1590) developed a prosthesis which carried its own artificial moustache, but the most famous golden nose is that of the Danish astronomer, Tycho Brahe (Lee, 1972). Born in 1546, the son of a Danish nobleman, he became a mathematician and astronomer of renown. Stubborn and impetuous, he fought a duel on 10 December 1566 with a fellow mathematician, Manderup Parshjerg, who also proved to be a better swordsman. Tycho lost most of his nose which

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was replaced by a prosthesis made by the lost wax process. The metal nose was painted to match adjoining skin and can be seen in the many oil paintings of this famous Dutchman. He died in October 1601 of a ruptured bladder, etiquette forbidding him to leave the dinner table despite copious drinking. Search of his embalmed body in June 1901, however, showed the legendary prosthesis to be missing. There was a narrow curved mark on the skull, rimmed by a bright green stain suggesting copper. Possibly the prosthesis contained this metal to improve durability and coloration.

It is doubtful if the most ingenious and technically able reconstructive surgeon can match the abilities of the modern prosthetist. Since most patients in this series had total rhinectomy for neoplasia, no attempt has been made to refashion a new nose. Custom-made prostheses have the advantage of allowing frequent inspection of the remaining nasal passages as well as replacement to match changing skin coloration. Most are attached to spectacle frames ensuring stability (Figs. 1 and 2).

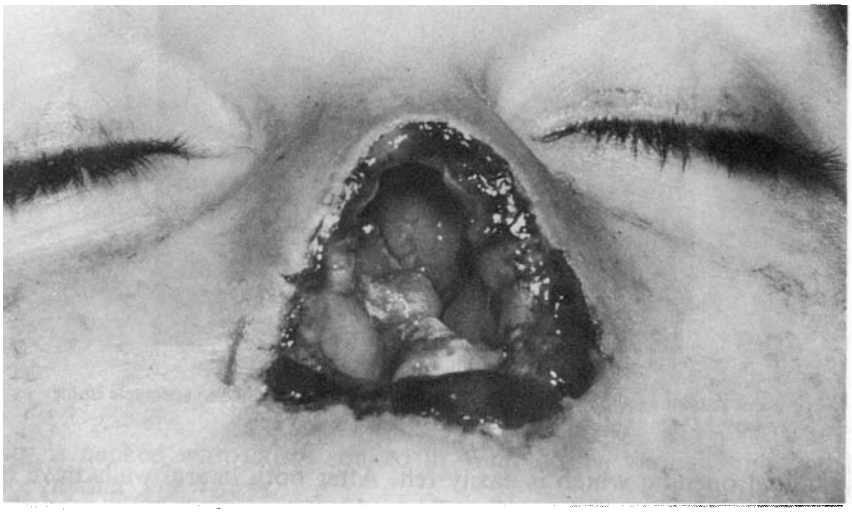


FIG. 1

Operative defect in a 23-year-old female following total rhinectomy for recurrent adenoid cystic carcinoma.

Surgical Technique

The external nose is composed of bone and hyaline cartilage, and it is the latter which is initially removed, leaving a pyriform bony aperture (Fig. 3). This is bounded above by the nasal bones, which articulate with each other in the median plane and frontal bone superiorly. Laterally, they join with the frontal process of the maxilla, whilst the remainder of the bony opening is formed by the free margins of the maxilla. The nasal cartilages are attached to the bony margins and are easily freed by an incision beginning at the lateral edge of one naris and following the edge of the

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FIG. 2
Same patient aged 31 years showing nasal prosthesis attached to spectacle frame.

pyramidal opening which is easily felt. After both lateral walls have been sectioned, excision of the columella and anterior septum is carried out under direct vision (Fig. 4). Inspection of the remaining nasal cavity allows further removal of bony septum, nasal bones and lateral wall of nose if there is doubt regarding adequate tumour margins. Extension inferiorly to involve pre-maxilla or palate requires in-continuity resection (Fig. 5). In these patients the nasal prosthesis is designed to lock into the intra-oral prosthetic device to insure good stability and adequate sealing. The nasal bones should be preserved, if possible, to provide adequate seating for the nasal prosthesis. Undercutting of the bony edge of the pyramidal opening assists in promoting rapid epithelialization of the margins—essential before fitting the artificial nose. Skin grafting is rarely necessary, coverage being obtained from surrounding skin.

Bleeding from the alar and septal branches of the facial artery and ophthalmic and maxillary vessels is easily controlled. If necessary the

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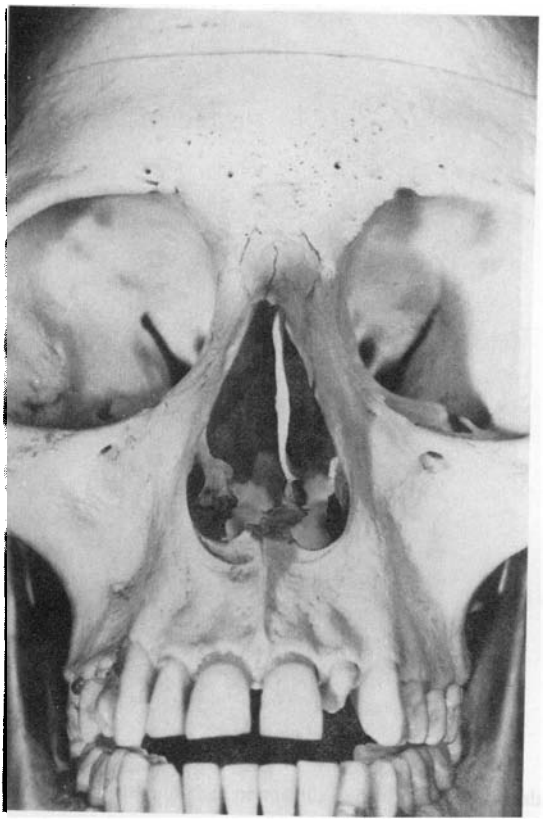


FIG. 3
Bony pyramidal opening.

cavity is packed with gauze soaked in Whitehead's varnish; this can be removed after 3 or 4 days.

Surgical Pathology

Malignancies arising within the nasal passages or extending from the paranasal sinuses are relatively uncommon. Over 90 per cent of identifiable primary neoplasms within the nose are squamous carcinomas although septal tumours are extremely rare. Weimert *et al.* (1978) found only 97 septal carcinomas in their review of the world's literature. Most arise on the anterior septum and rapidly involve the mucocutaneous junction, the columella and the cartilaginous framework of the nose. Extension posteriorly makes radical excision difficult because of the close proximity or invasion of the cribriform plate and nasopharynx. There is no evidence that the degree of cellular differentiation is directly related to prognosis, and most carcinomas are moderately well-differentiated. Presenting symptoms

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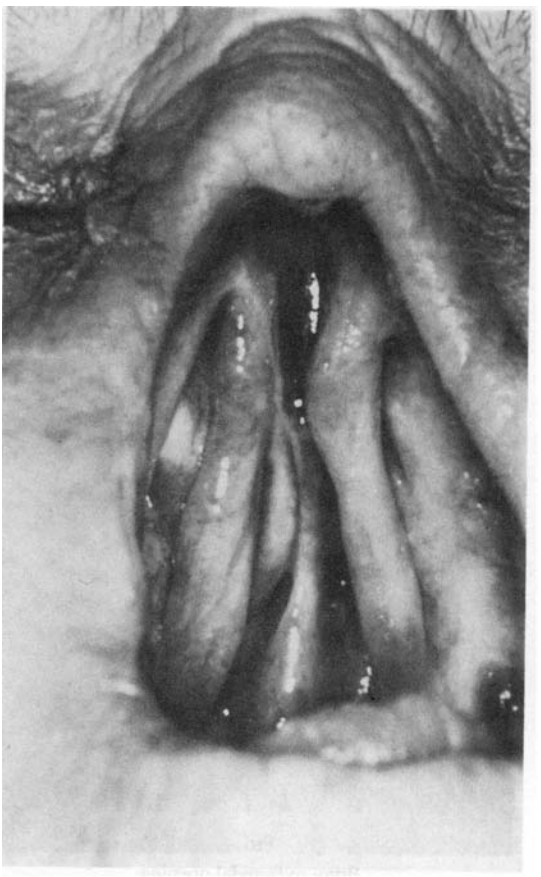


FIG. 4
Pyriform aperture showing epithelialized edges ready for custom made prosthesis. Both middle turbinals remain *in situ*.

of crusting and intermittent bleeding attract little attention; delay in diagnosis may be as long as six months, although I have seen no patient presenting with regional lymph node metastases.

Early septal carcinoma is usually treated with radiotherapy, unless it is thought to be small enough to be resected widely without damage to columella or nasal framework. Prognosis is primarily related to size of the tumour at diagnosis and the presence of regional metastases—said to be found in 10 per cent of patients. I am not at present concerned with an evaluation of my 13 patients treated for septal carcinoma but rather with the outcome of the 6 patients requiring total rhinectomy (Table I).

Radiation failure or extension from the septum to involve surrounding tissues necessitates wide surgical resection. My experiences with this small group certainly suggests that if this is technically possible, and the

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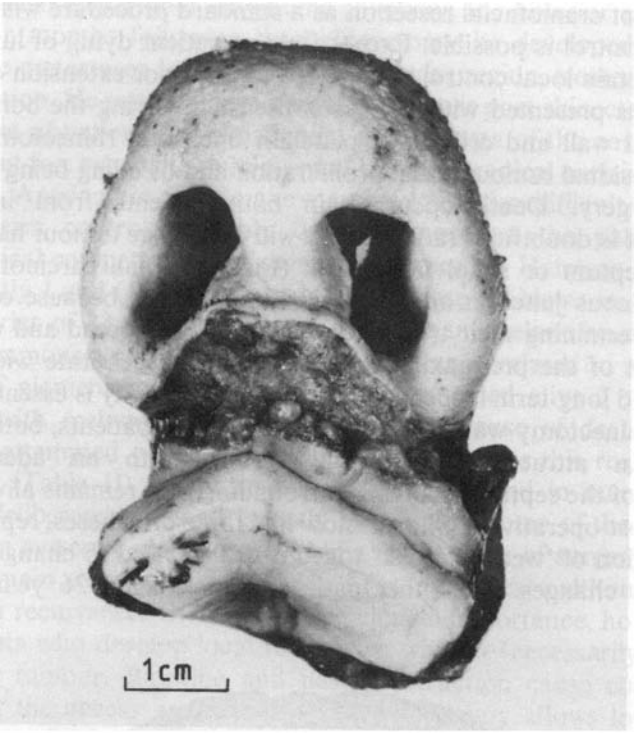


FIG. 5
Operative specimen with attached premaxilla and adjoining hard palate.

TABLE I

Case	Age/Sex	Site	Histopathology	Treatment	Follow-up
A.C.	61 M	Nasal framework and columella	Poorly differentiated	DXT → rhinectomy	2 years alive
B.B.	63 M	Septum and nares and premaxilla	Well differentiated	DXT → rhinectomy and hard palate	7 years alive
B.B.	81 F	Septum and cribriform plate	Moderately differentiated	Rhinectomy → uncontrolled disease posteriorly	18/12 dead
J.H.	54 M	Septum and framework	Moderately differentiated	DXT → rhinectomy → uncontrolled disease posteriorly	3/12 dead
C.R.	58 M	Anterior septum and upper lip	Moderately differentiated	Rhinectomy and upper lip	10/12 dead lung cancer
T.W.	71 M	Septum and framework	Transitional	Rhinectomy	3 years alive

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acceptance of craniofacial resection as a standard procedure will help, then long-term control is possible. Except for one patient dying of lung cancer, failure to obtain local control was related to posterior extension of tumour. Two patients presented with extensive disease involving the bony setpum, lateral nasal wall and cribriform plate. In one, total rhinectomy allowed access to residual tumour, local proliferation and bleeding being controlled by cryosurgery. Death occurred in both patients from intracranial extension. It is doubtful if radiotherapy will cure, once tumour has involved the bony septum or nasal framework (Fig. 6). Small carcinomas at the muco-cutaneous junction are particularly dangerous because of the difficulty of determining their true extent. Submucosal spread and undetected involvement of the pre-maxilla or bony septum necessitate wide surgical excision, and long-term inspection of the resulting cavity is essential.

Total rhinectomy was carried out on two other patients, both radiation failures. An attractive 23-year-old women with an adenoid-cystic carcinoma of the septum involving surrounding skin remains alive and well 10 years post-operatively. She has now had three prostheses, replaced from a combination of 'wear and tear' together with a need to change colour to match skin changes. The other patient, a male aged 26 years, had an

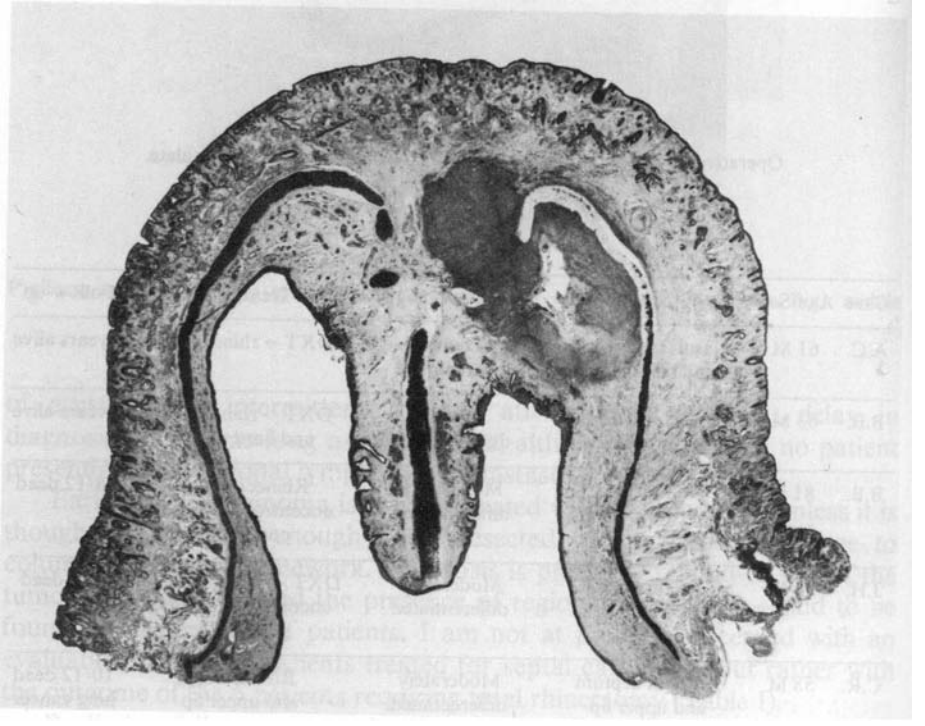


FIG. 6

Section through excised nose showing involvement of nasal septum and cartilage by malignant melanoma.

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extensive muco-epidermoid carcinoma involving the anterior septum and nares. Four months following total rhinectomy he developed a positive lymph node metastases in the left submandibular region, treated by radical neck dissection. He remains alive and well 14 years post-rhinectomy.

The care of patients with malignant melanomata of the nasal cavity is less clear-cut for, even with purely septal tumours, radical excision may not be possible. Amelanotic areas make margins of erosion difficult to estimate and long-term control probably depends more on the patient's own immunological competence than on surgical expertise. Harrison (1976) and more recently Lund (1981) have considered these problems in detail. In a personal series of 33 patients with nasal malignant melanoma, the septum was the commonest site of origin. Prognosis was unrelated to size, site or presence of pigmentation, and 30 per cent remained alive 5 years post-diagnosis, with melanomatosis the commonest cause of death. Radical removal is attempted where possible and in 5 patients this required total rhinectomy (Table II). Diagnsosis is rarely early and in many patients tumour is deliberately or inadvertently left *in situ*. Some of these patients will die from systemic metastases within a few months of surgery. A fortunate few remain clear of obvious disease for many years although always at risk from recurrence. Of considerable clinical importance, however, are those patients who develop local recurrence without (necessarily) regional or systemic tumour. Bleeding and nasal obstruction cause considerable anxiety, but the access provided by total rhinectomy allows local use of cryosurgery as frequently as required to produce symptomatic control. In one patient, this was continued for over 4 years the patient eventually dying at 81 years from a heart attack.

The remaining patient treated by total rhinectomy originally had a gumma of the nasal septum with collapse, fibrosis and gross distortion of the nasal structure. Recurrent attacks of acute fronto-ethmoiditis were difficult to control because of the nasal destruction. Reluctantly, the nose was

TABLE II

Case	Age/Sex	Site	Treatment	Follow-up	Outcome
D.B.	44 M	Septum and vestibule	DXT → rhinectomy	Local disease → 2° spine	18/12 dead
R.W.	67 M	Septum and palate and framework	Rhinectomy and palate	? carcinoma prostate	13/12 alive
M.B.	76 F	Septum and columella	Rhinectomy	Local disease → cryosurgery	4 years dead
W.N.	65 M	Septum and floor of nose	Rhinectomy	Local recurrence → removed	1 year alive
D.B.	57 F	Septum	DXT → rhinectomy	Free from disease	9 years alive

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removed to improve access and drainage. His nasal prosthesis is a considerable improvement on the original deformed organ and there have been no recurrences of paranasal sinus infection for the past 5 years.

Discussion

Whatever the reason, total rhinectomy is considered aesthetically disturbing by both patient and surgeon. However, disfigurement produced by uncontrolled neoplasia involving the nasal framework (Fig. 7) is more unpleasant than the poorest prosthesis! In addition, this operation can be curative for septal carcinoma and will provide effective access for long-term palliation in some malignant melanomata. Although technically uncomplicated, it may be necessary to combine resection with removal of the palate, antro-ethmoidal complex or cribriform plate. Possible difficulties in fitting a post-operative prosthesis must not be allowed to influence surgical resection, for the artificial nose may be attached securely by many means. Spectacle frames are advantageous when patients require glasses, com-



FIG. 7

Gross deformity of the nose in a 15-year-old girl from a benign tumour arising within the nasal passages.

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plete stability or frequent removal. Attachment to an intra-oral plate is useful when the hard palate has been removed, whilst occasionally patients are happy with the nose attached to the face by adhesive. My experience with these 14 patients has emphasized the real value of total rhinectomy, although availability of skilled prosthetic help is essential for effective rehabilitation.

Like total glossectomy or removal of the eye, one rarely regrets carrying out the operation but only the delay in persuading the patient of its advantages.

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