

## Reconstruction of the ala nasi and the lateral wall of the nose

E. Haas, Karlsruhe, West-Germany

### SUMMARY

*With reference to the functional importance of the vestibular region, it is recommended that only such operative methods should be practiced for the reconstruction of the ala nasi as take into account the aerodynamics of the vestibular region. The reconstruction of the cartilaginous infrastructure should therefore be an integrating component of the ala replacement. Various possibilities for the fulfilling of these requirements are pointed out and a pedicled septal mucosa-skin-cartilage flap described by the author which, in conjunction with a frontal skin flap permits the repair of the ala nasi in a shorter time is described in more detail. For the treatment of defects of the lateral nasal wall, in addition to the insular flap operation from the nasolabial region and the forehead, the medial frontal flap technique as described by Kazanjian is particularly recommended. This method is also suitable very particularly for closure of perforating defects in conjunction with the split skin graft.*

PLASTIC therapy of defects of the ala nasi is done mainly from the cosmetic point of view. Another oft quoted criterion for the efficiency of a substitution procedure is the time taken.

On the other hand, functional aspects have frequently remained unconsidered. The rhinologist cannot agree to such an evaluation. I would therefore like to try to outline the usefulness of some methods of reconstruction from the point of view of functional rehabilitation.

Bachmann's (1968) studies have shown that for the inward flow of air into the nasal cavity — and consequently for the respiratory resistance also — the anatomical internal orifice defined by Legler (1968) is decisive and not the external nares. This statement is of primary relevance for corrective rhinoplasty and modern septum surgery, but it should be considered in relation to the region of reconstruction of the ala nasi. Instead of a one-sided over-evaluation of the position and form of the external nares, our attention must also be concentrated on the anatomical internal nares and the isthmus nasi (formerly: ostium internum). Because this aerodynamically very sensitive region is normally of the greatest significance for the resistance to respiration as a result of the nasal flaps functioning like valves which are situated there, and a stenosis in their vicinity —

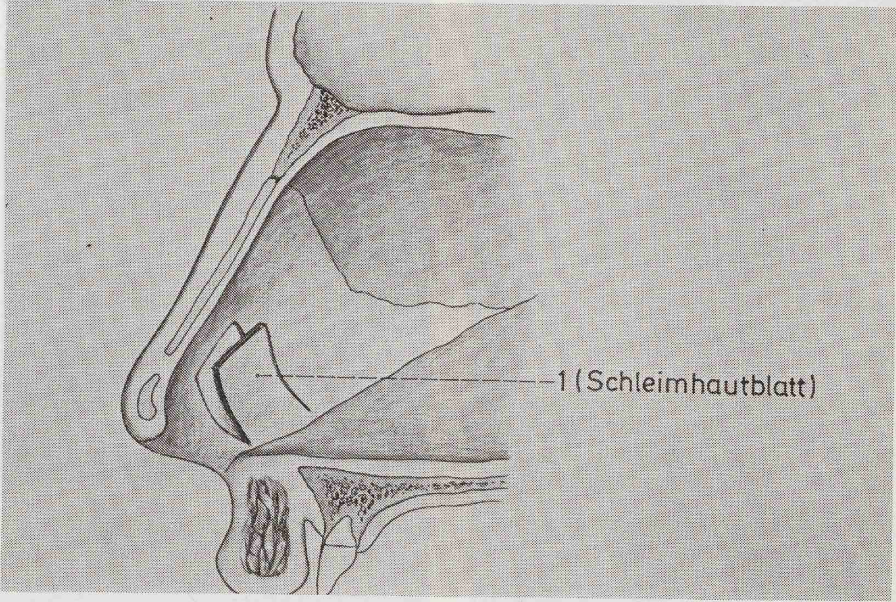
as Masing was able to demonstrate rhinometrically — leads to a considerable raising of the coefficient of resistance.

For the reconstruction of the ala nasi the requirement can be deduced that only such operative techniques should be practiced, if at all possible, which take into account the functional significance of the vestibular region. That means that the restoration of the cartilaginous infra-structure should be an integrating part of the plastic replacement of the ala, and that the limitation to a purely external and internal skin substitution cannot usually be satisfactory. One might object that this requirement could be met by practically every technique by lining the adjacent or distant flap intended to replace the ala nasi with a cartilage graft. But such a measure only copes with the previously mentioned respiratory physiological significance of the vestibulum nasi if at the same time attention is paid to a functional shaping of the isthmus nasi. This aspect is taken into account by the method described by König (1902) of a combined skin-cartilage graft from the auricle, which at the same time guarantees a satisfactory cosmetic result. In particular, the concave arched cartilage of the cavity, which adheres firmly to the skin of the anterior side of the auricle permits a functionally sound reconstruction of the vestibulum region and may be designated as the method of choice in the treatment of stenosis in this area .

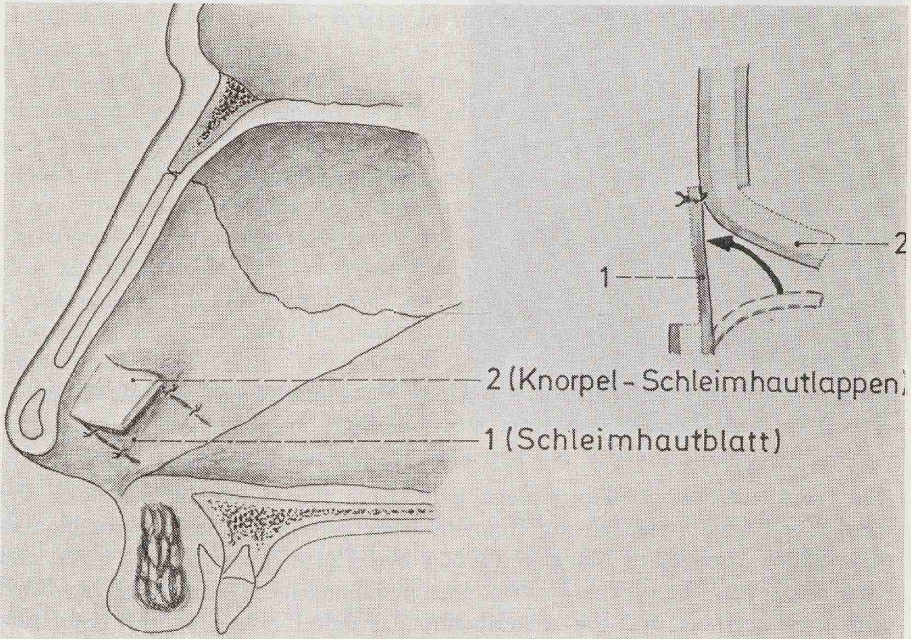
However, in reconstruction of the ala nasi by means of composite grafts, limits are set by the extent of the defect, so that other ways must be taken in larger alar defects. Starting from the conception that the skin-cartilage graft from the auricle is ideal from the functional point of view, then for the subtotal and total ala nasi repair, the use of bilaminar composite grafts combined with a frontal flap as described by Gillies (1957) is almost essential. This principle is both a component of the method described by New (1945) and improved by May (1949) of the temporo-frontal sickle flap and also of the scalp flap technique of Converse (1942). However, it includes the lining of the frontal flap portion intended for the ala nasi replacement with a free skin-cartilage transplant in a previous operative session. For reasons of time saving we have therefore suggested a pedicled septal mucosa-cartilage flap as the internal lining (see Figures 1a and b). In addition, the septal mucous layer turned to the alar defect is separated from the cartilage corresponding to the size of defect in an inverted U-form and the remaining bilaminar portion of the septum attached to the dorsum of the nose moved into the alar defect, with the flap of mucous membrane released initially. The previously created septal defect is closed. In the same session, the Converse (1969) scalp flap or a horizontal and slightly obliquely cut frontal flap which we — as well as Meyer (1968) — consider very useful, especially in older patients, for the covering of the exterior defect is pulled down from the forehead (see Figures 1c - e). In addition to the reduction of the number of individual sittings, this modified technique facilitates a functionally suitable shaping of the isthmus nasi, in that a disturbing septal deviation in the vestibular area is essentially corrected.



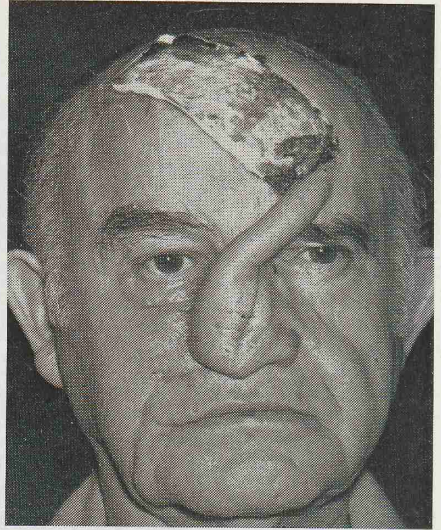
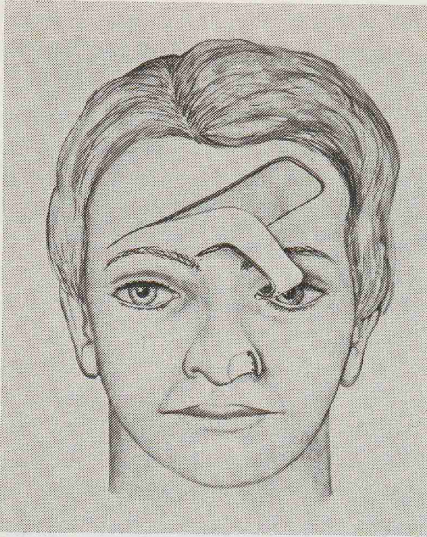
Figure 1. Reconstruction of nasal ala.



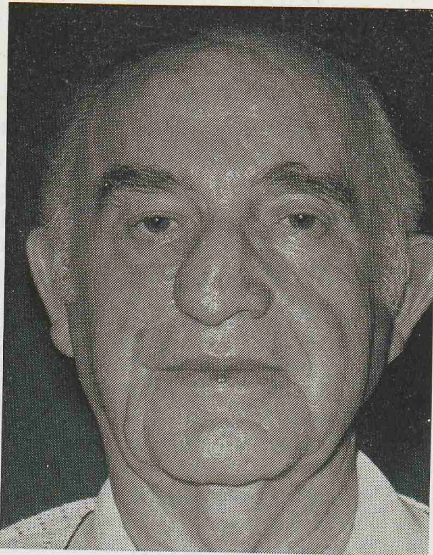
- a) Septal mucosa on the defect side used in reverse U-shape separated from cartilage.
- b) The compound septal mucosa-cartilage flap pedicled on the nasal dorsum is moved. The septum defect is closed in advance by mobilizing the septal mucosa.







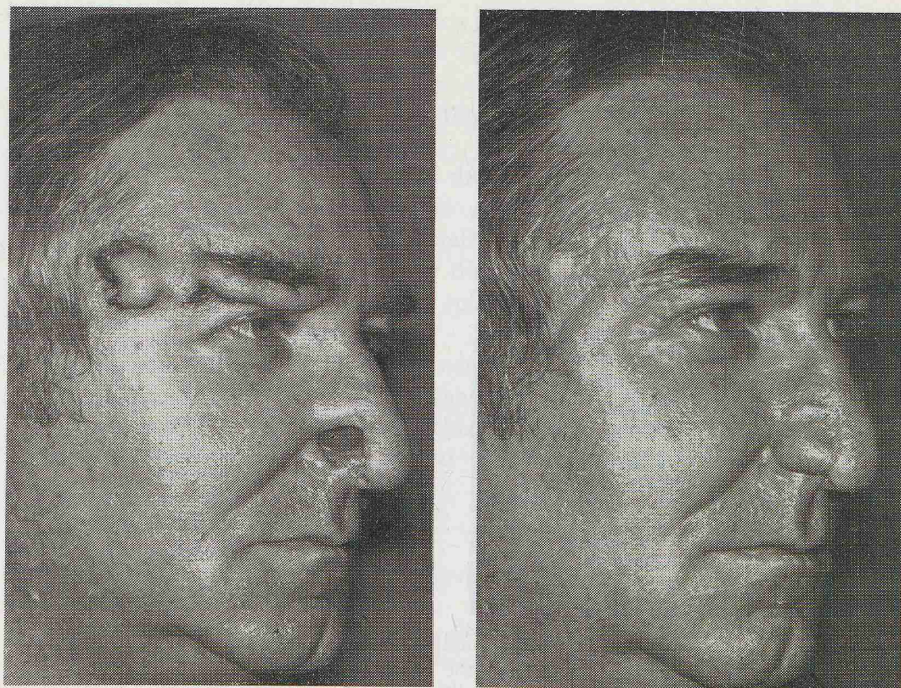
c and d) Oblique flap from the forehead to cover the outside and to reconstruct the free margin of the ala.



e) Situation after turning backward the rest of the raised flap.

The transplantation of skin-cartilage parts from the auricle by means of the tubular or bridging flap arising from the hairy part of the scalp is common to the methode described by Maggiore (1960), Serer (1962) and Meyer (1968) and takes account of the previously mentioned requirements. The expense associated with these methods and the residual auricular defect caused by the restoration





Figures 2a and b: Reconstruction of the nasal ala by using a fronto-temporal flap.

limit their use to extensive defects in the soft parts of the nose. The fronto-temporal flap described by Schmid (1952), on the other hand, can be recommended principally for the reconstruction of the ala nasi with the limiting proviso on the larger number of sessions which are necessary (see Figure 2). Because, by careful operation, it is possible to form a largely naturally effective ala nasi which is no longer subject to subsequent shrinking and not least also does take into account the demands of respiratory physiology in an excellent manner.

In contrast to the reconstruction of the ala nasi, the functional aspects are of less significance in plastic treatment of defects of the lateral nasal wall. The assessment of the different repair methods is consequently based primarily on cosmetic criteria and on the number of individual sessions necessary for the removal of the defect.

Thus the insular flap operation from the nasolabial region permits the closure of a non-perforating defect of the lateral wall in one session, if a later excision of the fatty connective tissue pedicle, which is not very disturbing, is dispensed with (see Figure 3).

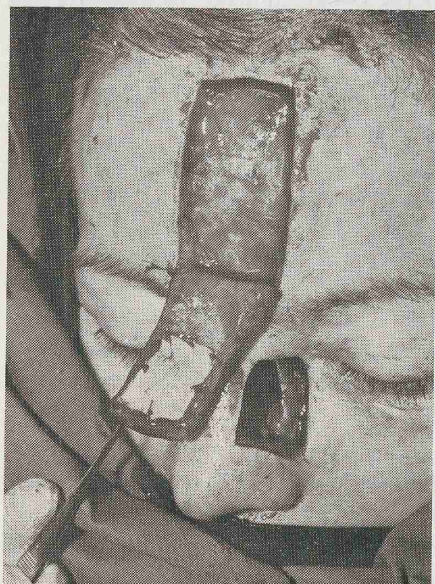
On the other hand, because of the greater distance between the withdrawal area and the region of the defect, in insular flaps from the forehead a previous peritomy is recommended, so that the frontal artery incorporated in the subcutaneous flap pedicle is not injured in the second session.





Figures 3a and b: Covering of a nonperforating defect of the ala and the lateral nasal wall by means of a isle flap taken from the nasalabial region.

Figure 4a and b: Closure of a perforating defect of the lateral wall using a medial flap from the forehead in connection with splitgraft in order to cover the inner surface.





Whereas smaller non-perforating defects in the lateral wall of the nose can be compensated by an H or U shaped flap displacement in larger defects the median frontal flap Kazanjian's comes into use, especially as the method is practicable also in patients with low foreheads and consequently limited flap formation.

If the defect is a perforating one, then the median frontal flap with one or two tilting flaps from the nasolabial region can be combined. On the other hand it is simpler to line the end of the frontal flap with a free split skin graft which can be done in the same sitting, since the good circulation of the frontal flap generally guarantees the taking of the split skin graft with its modest nutritive requirements (see Figure 4).

The time allotted to me naturally does not permit an exhaustive treatment of the subject and so useful reconstructive methods as e.g. the italian method for repair of the ala nasi and the abdomino-brachial sandwich flap for the treatment of larger perforating defects of the lateral nasal wall and the adjoining area of the cheek must remain unmentioned.

#### ZUSAMMENFASSUNG

Unter Hinweis auf die funktionelle Bedeutung der Vestibulumregion wird empfohlen, zur Nasenflügelrekonstruktion nur solche Operationsmethoden zu praktizieren, die der Aerodynamik des Naseneingangsbereiches Rechnung tragen. Die Wiederherstellung der knorpeligen Infrastruktur sollte deshalb ein integrierender Bestandteil der Flügelersatzplastik sein. Verschiedene Möglichkeiten zur Erfüllung dieser Forderung werden aufgezeigt und ein vom Verf. angegebener gestielter Septumschleimhaut-Knorpellappen, der in Verbindung mit einem Stirnhautlappen den Nasenflügelersatz in kürzester Frist gestattet, näher beschrieben. Zur Versorgung von Defekten der lateralen Nasenwand wird neben der Insellappenplastik aus der Nasolabialregion und der Stirn insbesondere der mediane Stirnlappen nach der von Kazanjian angegebenen Technik empfohlen, der in Verbindung mit einem Spalthauttransplantat auch zum Verschluss perforierender Defekte hervorragend geeignet ist.

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Prof. Dr. E. Haas,  
ENT Clinic St. Vincentius Hospital,  
75 Karlsruhe, West-Germany.