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Vestibuloplasty

(A new one-stage operation for atrophic rhinitis)

by

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It is proposed that primary atrophic rhinitis belongs to a group of conditions under the heading 'Reflex Sympathetic Distrophy Syndrome'. This leads to decalcification of the turbinals, as in Sudeck's atrophy. Collapse of the decalcified turbinals is brought about by the impact of the inspiratory stream, and this is followed by atrophic changes. Based on this hypothesis, a new operation ('Vestibuloplasty') has been devised in order to direct the stream away from the turbinals and to dissipate the force of the stream so that its impact on the turbinals is minimized. Following this operation, 92 per cent of the cases have benefitted; this is comparable to the result following Young's or a modified Young's operation. After vestibuloplasty the patient can breathe through the nose and clean the nose as normal persons do; a second-stage procedure for reopening the nostril is not necessary and the chances of recurrence are negligible as compared to those following Young's operation.

Introduction

It is well-established that, with atrophic rhinitis, the nasal fossae heal behind 'closed doors' after Young's or a modified Young's operation, though it is not understood why this should be so. It has been shown that it does not make any difference, so far as heating is concerned, whether a hole of 3 mm.×3 mm. (Sinha *et al.*, 1977) or of 3 mm.×1 cm. is created during Young's operation. In our experience, we have found that complete closure of the nostrils is not necessary for healing. We propose that the basic pathology in atrophic rhinitis is a 'Reflex Sympathetic Dystrophy' causing osteolysis, followed by collapse of the turbinals under the impact of the inspiratory stream and subsequent atrophic changes. So, it is the direction of this stream and the place (target) of impact of the stream that are important, rather than complete stoppage of the stream by closure of the nostrils. Keeping this in mind, a new technique of vestibuloplasty has been devised, as reported here, in order to direct the inspiratory stream towards the septum, away from the turbinals, and thus to reduce the strength of the impact by dissipating the forces of the stream. The nostrils are not completely closed in this operation; the neo-nostrils are simply shifted medially. This obviates the need for a second operation for reopening the nostrils, as is done following Young's operation. After vestibuloplasty, the otolaryngologist is able to observe the nasal cavity periodically by simple anterior rhinoscopy, in order to assess the progress of healing or otherwise, as after palatal fenestration for maxillary antral cancer. Moreover, the patient can breathe through the nose without undergoing the ordeal of mouth breathing that is inevitable after the classical Young's operation. Furthermore, as under normal conditions, the patient can clean his/her nose by blowing out the nasal secretions or by drawing them backwards without any problem. By means of this operation, the direction of the inspiratory stream is permanently

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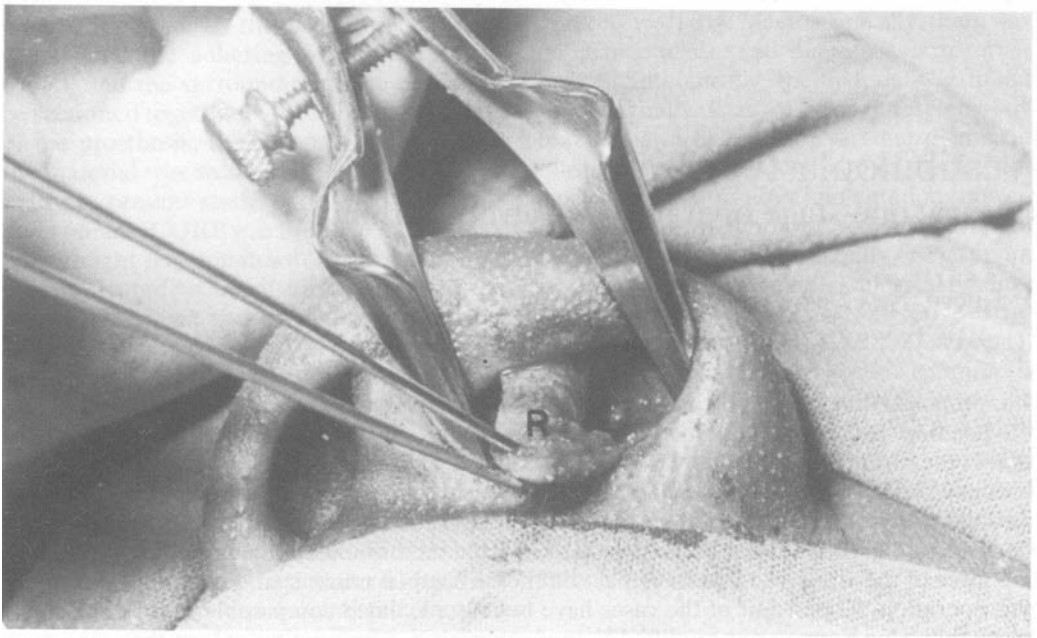


FIG. 1

The skin flap has been raised from the lateral vestibular wall. The raw surface is shown (R).

changed and a permanent 'rest' (as offered by the classical or modified Young's operation) is ensured to the nasal vascular structures, thereby minimising the incidence of recurrence.

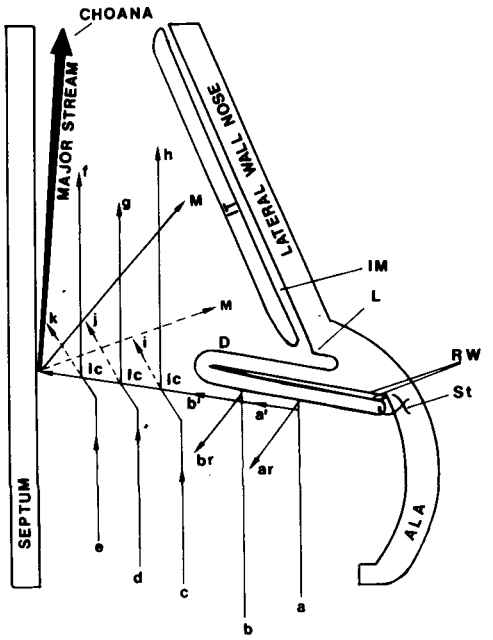
Material and methods

Twenty-five adult cases of established atrophic rhinitis have been used in this study. After disappointing results had been obtained with earlier conservative treatment stellate ganglion blocks were given, three on each side, at intervals of a week, before subjecting these patients to 'vestibuloplasty' as described below.

Operative technique

After induction with gas-oxygen anaesthesia, a vertical incision is made parallel to 3 mm. behind the alar margin after infiltrating the area with 1 per cent xylocaine and one in 200,000 adrenalin solution. A posteriorly based skin flap is raised from the lateral vestibular wall (Fig. 1) without touching or injuring the alar cartilage, as this might lead to deformity of the ala requiring cosmetic rhinoplasty. The raising of the flap is done in such a way that the base is at the limen vestibulae. After ensuring haemostasis, the flap is folded over itself laterally, with the raw surfaces (Fig. 1, R) apposing each other (Fig. 2, RW) and with its free margin falling on and coinciding with the line of attachement of the flap to the lateral wall of the vestibule. These are stitched with 3–0 chromic catgut (Fig. 2, St. and Fig. 3) and a diaphragm is thus constructed with its lateral margin attached to the vestibule (Fig. 2 and 4). The medial margin was left free (Fig. 3, F). One or two stitches are put through-and-through in the central part of this bilaminar diaphragm, to obliterate the dead space between the raw surfaces of the folded flap. Two horizontal incisions are made, one each on the floor and roof of the vestibule, starting near the attached margin of the flap and coursing medially and backwards to a point approximately equal to the horizontal width of the folded flap. Another two incisions are made, one above and one blow, 2 mm. in front of and parallel to the first ones;

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D - DIAPHRAGM. RW - RAW SURFACES
IT - INFERIOR TURBINAL (ATROPHIED).
IM - INFERIOR MEATUS.
a,b,c,d,e, - INSPIRATORY STREAMS
a',b' - DEFLECTED a & b.
H - a', b' HIT SEPTUM.
M - MINOR STREAM OF a', b'.
IC - INTERCEPTIONS
f,g,h - CHANGED e,d,c.
i,j,k - MINOR STREAMS OF c,d,e.
L - LIMEN VESTIBULI.
St - STITCH
ar, br - REFLECTED PARTS OF STREAMS a & b.

FIG. 2

Aerodynamics after vestibuloplasty.

and a narrow strip of skin of about 2 mm. width between the two incisions is removed, one from the roof and the other from the floor of the vestibule. The upper and lower margins of the diaphragm are then stitched with 3–0 chromic catgut to the upper and lower raw areas, left after removal of the strips of skin, in order to stabilize their medial parts and to help assume a slanting position, coursing posteriorly and medially from its attached margin (Fig. 2). The slant effectively deflects the inspiratory stream medially and backwards (Fig. 2(a) and (b)). Thus a vertical gap, about 6 mm. × 12 mm., is left between the free margin of the diaphragm and the septum (Fig. 4) for respiration. Finally, an antibiotic ointment dressing is applied and the patient is put on a systemic antibiotic for seven days. This is followed by three stellate ganglion blocks on each side, at weekly intervals, starting on the third day after operation.

Observations and discussion

The nasal diaphragm created by this vestibuloplasty has a slanting disposition from before backwards and medialwards (fig. 2), in such a way that the inspiratory stream is directed medially and backwards towards the septum (Fig. 2, D, (a) and (b)). The inspiratory streams are deviated medially and their forces are dissipated and reduced effectively, as follows: the streams (a) and (b) (Fig. 2) are partly reflected (Fig. 2, (ar) and (br)) on striking the diaphragm and the principal parts are channelled medially (Fig. 2, (a^1) and (b^1)); then they strike the septum and their reflected major parts go to the choana through the medial part of the nasal fossa (Fig. 2, major stream) and some minor parts (Fig. 2, M) are reflected laterally, to impinge on the lateral nasal wall with much reduced pressure. Streams (c), (d) and (e) (Fig. 2) are bent medially by the streams (a) and (b) (Fig. 2), whence some parts proceed posteriorly (Fig. 2, (h), (g) and (f)) and the rest are deviated medially (Fig. 2, (i), (j) and (k)). Thus the pressure of the inspiratory stream is significantly dissipated and reduced, and in this way direct impingement on the turbinals is effectively avoided or reduced. In other words, the limen vestibuli is augmented by creating this diaphragm, to provide functional restitution. The patient has no difficulty in breathing post-operatively; at the same time the nasal fossae get an adequate 'rest' (as offered by young's operation) and the nose goes on to heal itself without being disturbed by the inspiratory stream. After the operation the patient, besides being able to breathe, can clean the nose either by blowing forwards or by drawing the secretion backwards, as a normal person does. A second-stage procedure for reopening the nostrils is thus eliminated, the nasal fossae can be checked periodically through the anterior nares, and the successive stages of regeneration can be assessed.

After undergoing this operation, 23 of our

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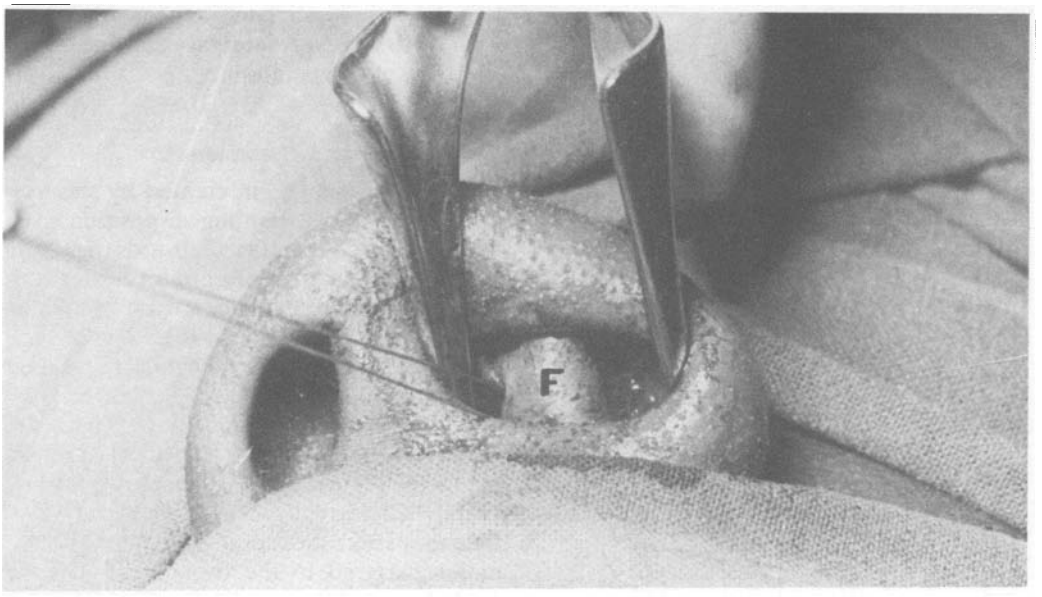


FIG. 3
The skin flap (vide Fig. 1) is folded laterally over itself and stitched. F-Free medial margin of the diaphragm.

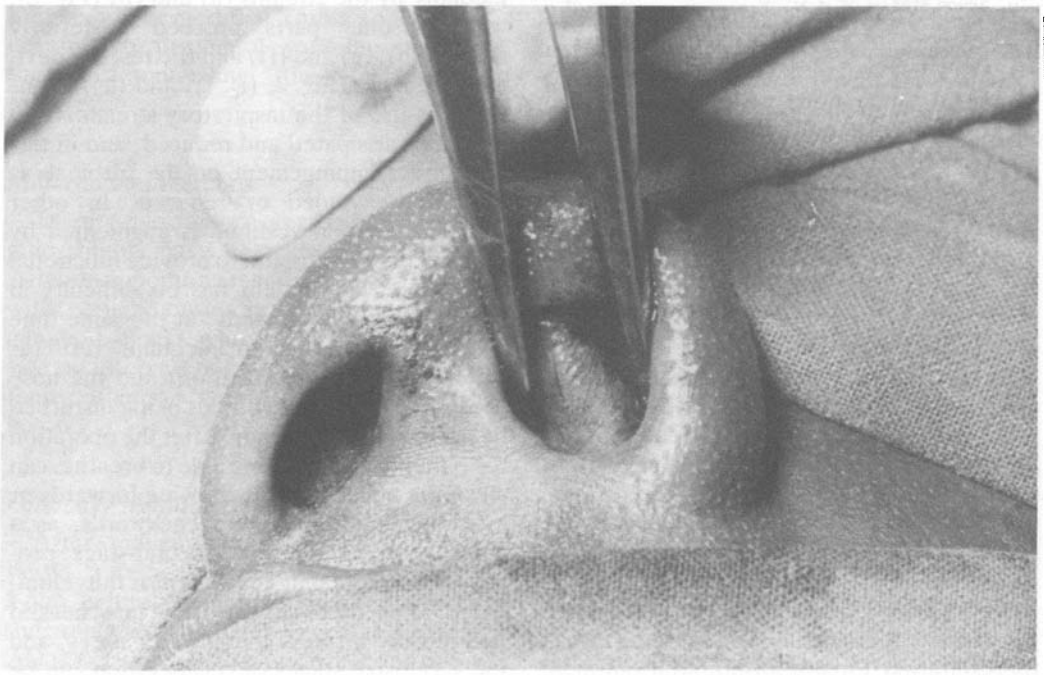


FIG. 4
Nasal diaphragm after operation. Note that the neo-nostril is situated medially.

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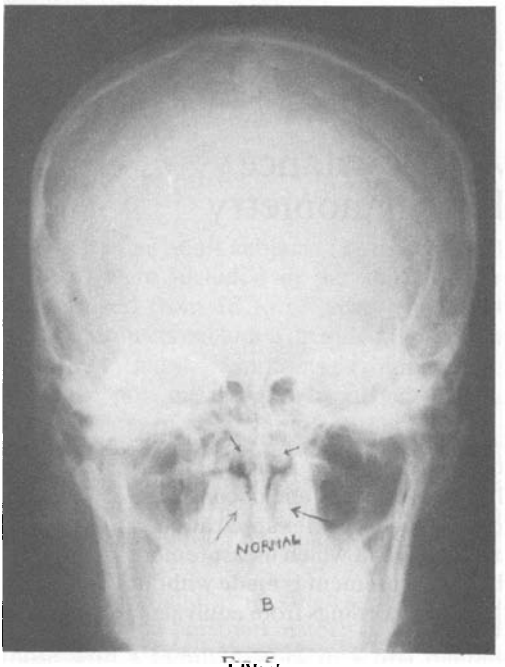


FIG. 5

Skiagraph showing excellent calcification following vestibuloplasty (reproduced with the kind permission of the Editor, Journal of Laryngology and Otology).

patients showed very satisfactory healing (Fig. 5), comparable to that after the classical Young's operation or its modification. None of them has shown any deterioration as one sees in some cases within 6–8 months of undoing Young's operation. Since the rechannelled inspiratory steam continues to pass through the medial compartments of the nasal fossae after vestibuloplasty for the rest of the patient's life, the structures carrying the vascular erectile tissue are thereby protected and 'rest' is ensured indefinitely.

The excellent results following this operation vindicate our hypothesis of the aetiopathogenesis of atrophic rhinitis, namely, that decalcification of the turbinates, brought about by reflex sympathetic dystrophy, renders them collapsible so that they collapse readily under the impact of the inspiratory stream which inpinges on them continuously, thus leading to atrophic rhinitis. This process is effectively prevented and/or reversed by just rechannelling the respiratory stream through the medial parts of the nasal fossae and dissipating the force of the stream. Complete closure of the nastrils is unnecessary.

Acknowledgement

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References

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