

Rotation of the alar cartilage in collapsed ala

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SUMMARY

There are various causes for collapsed ala nasi. In elder people especially, the lateral crus of the alar cartilage is frequently deformed in shape and position. Model experiments show that by rotation of the lateral crus outwards and upwards, the vestibulum is expanded and the tip of the nose raised. On the basis of these experiments, in 19 patients with collapsed ala nasi, the lateral crus of the alar cartilage was rotated dorsally. The longterm results showed a satisfactory functional and aesthetic outcome.

INTRODUCTION

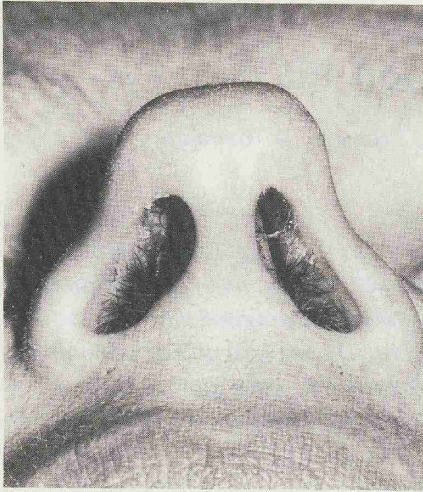
Collapsed ala, sometimes also known as "aspiration phenomenon", always occurs when the ala nasi is not capable of resisting the suction of the stream of inspired air. This phenomenon has various causes. If the nasal cavity is too narrow, as for example in tension nose, in septum deviation or various stenoses in the vestibular area, the inspiratory negative pressure rises, particularly on physical exertion, and the ala may easily collapse.

But this phenomenon also occurs with normal breathing, particularly in elderly patients with flaccid and deformed alar cartilages. The lateral crus of the alar cartilage has sunk caudally and projects into the nasal cavity (Figure 1).

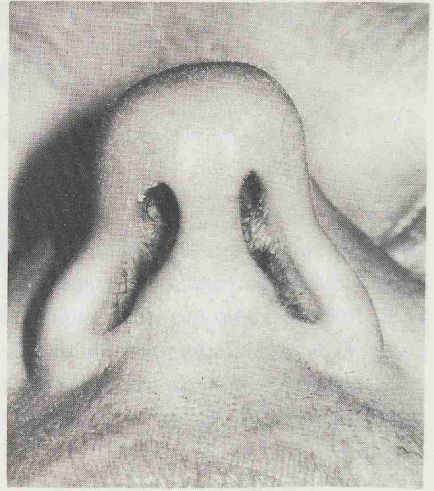
The correction of this irregularity is the object of the present study, which is based on experimental models and 19 relevant operated cases.

Experimental studies

In order to study the structure and tension relationships of the ala nasi, we removed an appropriate cartilage from a recently deceased patient and fixed it with its medial crus in a vertical position. If the two crura are in the same plane, as in a collapsed ala, the distance between the crura is distinctly shorter than if the lateral crus is rotated backwards through an angle of about 30° (Figures 2a and b). The latter position corresponds to the physiological structure of the alar cartilage. If the tension relations of the alar cartilage are observed in a transparent plastic model in polarised light, it is clearly seen that, by an outward rotation of the lateral crus, the tension lines are distributed over a larger surface, and therefore the

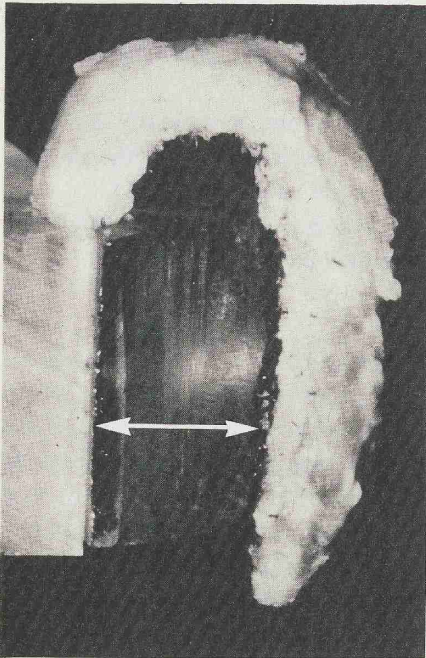


a. quiet breathing.

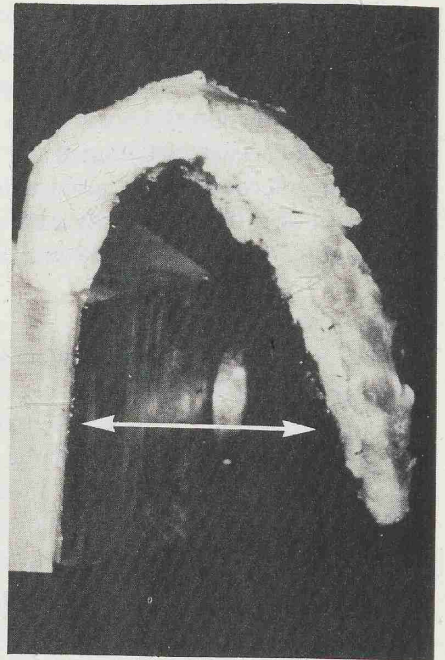


b. slight forced breathing producing alar collapse.

Figure 1. Deformed alar cartilages. The lateral crus projects into the nasal cavity.



a. The medial and lateral crus are in the same plane i.e. narrow vestibule.



b. The lateral crus is rotated backward i.e. wide vestibule.

Figure 2. Structure of the alar cartilage in different positions.

stability of the system is increased. In collapsed ala, blue tension lines are found only in the vault region.

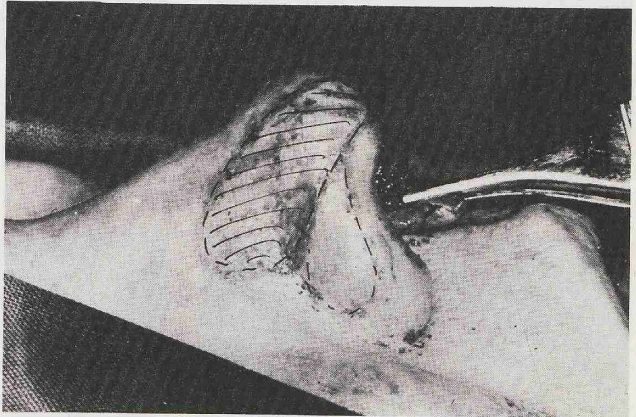
Surgical correction of collapsed ala

Two principles for the correction of collapsed ala are chiefly recommended in the literature:

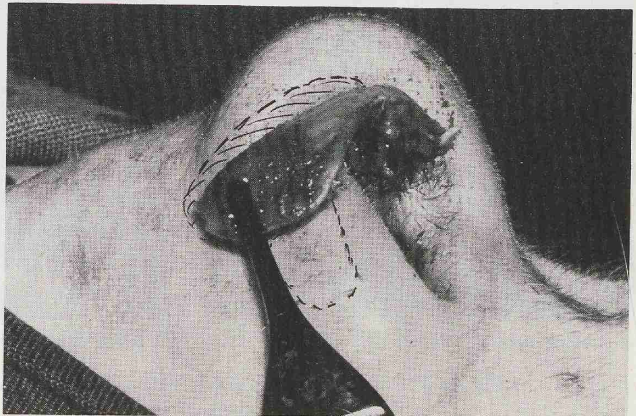
1. the stiffening of the cartilage by additional grafts (Fomon (1960), Hage (1965), Marino (1968), Masing (1971), Meyer (1964), Podvinec (1966), Wedig (1965)).
2. The displacement or alteration of the cartilage already present by turning through 180° or fixing to the triangular cartilage (Fomon (1960), Meyer (1964), Walter (1959)).

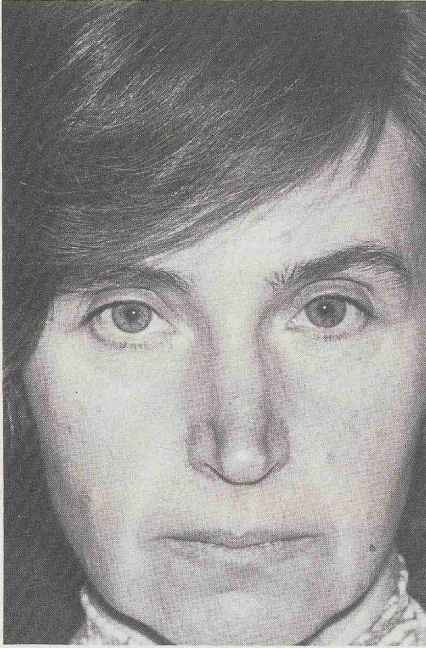
Since, on the basis of longterm studies, the methods mentioned so far do not functionally satisfy us, in the last two years we have used a modified rotation technique only, as Farrier (1974) described it in the correction of collapsed ala due to hare lip nose deformities.

Figure 3.
a. The new position of the lateral crus is outlined on the skin and the cartilage is exposed by preserving the dome area.

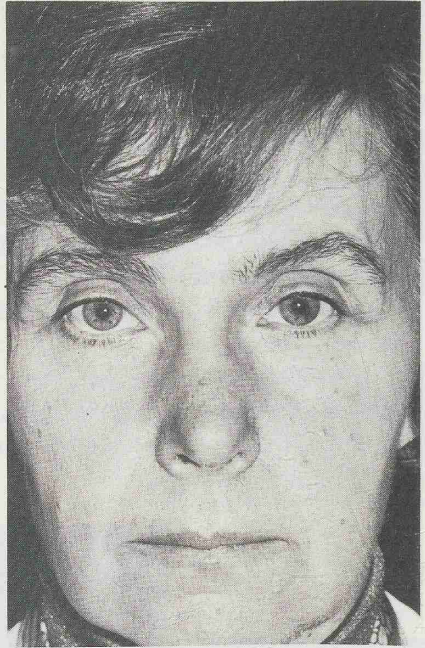


b. The exposed crus is completely freed and rotated upward.

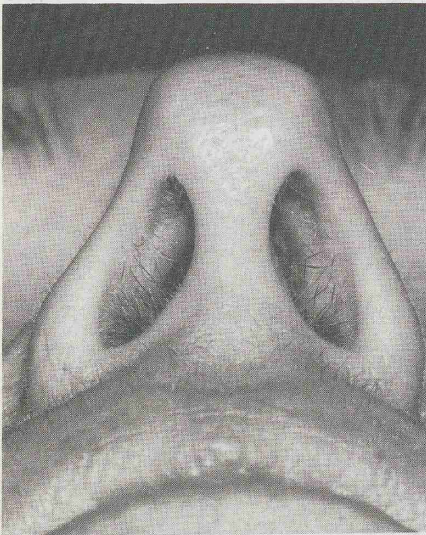




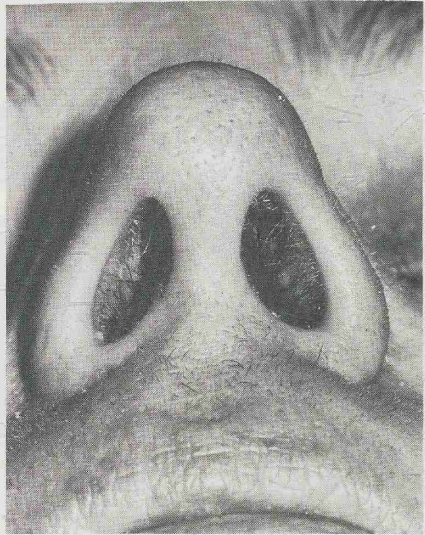
a. before.



b. after rotation.



c. before and



d. after correction.

Figure 4. 45 years old patient with deformed alar cartilages. Notice the vestibular space difference.

Operative technique

The new position of the lateral crus is outlined on the skin. Starting from an incision at the border of the ala nasi, the lateral crus of the alar cartilage of both sides is freed from its covering layers and exposed including the vault region. By keeping close to the subperichondral layer the vestibular skin can also be loosened easily (Figures 3a and b). Then a pocket is made over the triangular cartilage and the alar cartilage rotated upwards by means of a traction thread. There it is fixed with a mattress suture tied over a Teflon foil. The skin is closed with 6x0 Prolene button sutures. This rotation lifts the tip of the nose, and the nostril as well as the vestibulum regain their natural shape (Figures 4a, b, c and d).

RESULTS

We have performed this operation in 19 patients with collapsed ala. In addition, the septum was corrected or the columella narrowed in 8 patients. In almost all cases nasal breathing was considerably improved subjectively and objectively after 6 months. In only one case the alar cartilage collapsed again into its previous position and the nasal breathing remained unchanged. We believe, that in this case the fixation of the alar cartilage was not adequate.

A rhinomanometrically measurable increase in the flow rate (litres/sec) at 15 mm pressure difference before and after the operation was found in 4 controlled patients in whom rotation of the alar cartilage had been performed alone. The values were determined by anterior rhinomanometry as the mean of several measurements after the swelling of the nasal mucosa had subsided.

Summarising, it can be said, that the rotation technique which we have modified has proved its value in deformed lateral crus with inspiration phenomenon. The operation restores the physiological conditions of the ala nasi structure. However, the inspiration phenomenon is frequently due to several causes, so that an accurate diagnosis of the function and structure of the nose before the intervention is of the greatest importance.

ZUSAMMENFASSUNG

Der Nasenflügelkollaps hat verschiedene Ursachen. Vor allem bei älteren Menschen ist häufig das crus laterale des Flügelknorpels in Form und Position deformiert. Im Modellversuch läßt sich zeigen, daß sich durch Rotation des crus laterale nach außen und oben das vestibulum nasi erweitert und die Nasenspitze anhebt. Aufgrund dieser Versuche wurde bei 19 Patienten mit Nasenflügelkollaps das crus laterale der Flügelknorpel nach dorsal rotiert. Die Langzeitresultate zeigten ein befriedigendes funktionelles und ästhetisches Ergebnis.

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