

Septum surgery in children; indications, surgical technique and long-term results

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SUMMARY

This paper summarizes the author's experience with septum surgery in children from 1963 to 1978. Some 150 children have been operated upon and many of them could be followed up.

A septal deformation with breathing problems at rest is an indication for conservative surgery regardless of the patient's age. If there is only breathing difficulty during exercise, other factors (age, external deformity, psyche) play a role in making the decision. Septal deformities without functional complaints are left untouched. The prevention of a growth deformity can be a concomitant factor in deciding whether to operate.

Fresh fractures, septal haematoma's and abscesses are undisputable indications for surgery.

The surgical technique as used in the two most frequent types of deformation is described.

A boy operated upon at the age of 4 was followed-up over a period of 15 years. His nose developed normally until puberty. Then some growth disturbance became apparent.

After having been exposed to Cottle's techniques of conservative septal - pyramid surgery in the early sixties we started to perform septal surgery in children in 1963. Our experience, therefore, comprises a period of 15 years. Approximately 150 children have been operated upon by myself or under my supervision. Many of them could be followed up.

It is the purpose of this paper to summarize briefly our experience in this field, as was done by other authors (for survey see Pirsig, 1977). Special attention will be paid to the indications, the surgical technique and the long-term results.

INDICATIONS

In the course of time we have learned to distinguish the following three indications for septal surgery in children:

1. Septal deformity with impaired nasal breathing
2. Septal deformity with disturbance of nasal development and
3. Fresh fractures, septal haematoma, septal abscess.

1. *Impaired nasal breathing* was by far the most frequent reason for operating. Three groups can be distinguished.

Group 1: Children in whom nasal respiration is so impaired that mouth-breathing is necessary even at rest. In this situation surgery is almost always indicated regardless of the age of the patient. The advantage that can be obtained in these cases by early conservative surgery is so significant that the possible disadvantages of the operation seem fully acceptable.

Group 2: This group consists of the children who have no breathing problems at rest, but only have difficulty during exercise and sport. In this group I also include children in whom the septum deformity leads to sniffing or crusting. In these cases the decision to operate is more difficult and the advantages and disadvantages should be carefully evaluated. Among the disadvantages should be considered the patient's age, the degree of the external deformity and the psychological aspects of an operation. In doubtful cases I am inclined to postpone surgery. I advise photography of the nose for later comparison and annual follow-up.

Group 3: On children with septal deformities without functional complaint one should not operate.

2. *The prevention of a growth deformity* can also be an indication for surgery (Huizing, 1966). It is generally known that most adolescents with a nasal deformity report that their nasal malformation very gradually developed. From our knowledge of the normal development of the nasal and midfacial structures we can explain this observation. It is known that the septum determines the growth of the nose in its vertical (length) and ventro-dorsal (prominence) dimensions and we can thus understand that a septal trauma can greatly influence further nasal growth.

The question now arises in how far the development of such a growth deformity can be prevented by early septum surgery. Experimental work on young animals – although the results are not identical – has shown that we should not be optimistic (e.g. Sarnat and Wexler, 1967; Verwoerd et al., 1979). On the other hand, the experience of those of us who carry out these operations for a long time already has made it clear that there

is no need to be pessimistic either.

Personally, I think that we have to make a distinction between the deviated nose with a normal prominence and the depressed nose with an underdeveloped bony and sagging cartilaginous vault.

Deviations of the nasal pyramid can generally be prevented by early septum surgery. However, in most cases they can equally well be corrected after puberty.

A *depressed* nasal pyramid on the other hand is very difficult to correct in later life. Unfortunately, it is also very questionable whether this deformity can be prevented by early septum surgery. However, there seem no contra-indication for trying this.

3. *Fresh fractures, septal haematoma and abscess*

Whereas the need for correction of long-standing deformities in childhood is limited, this is not the case in the acute nasal trauma and abscess.

Immediate reposition of the septal skeleton in patients with a fresh trauma and reconstruction of defects by implantation of homologous material in children with abscesses have proved to be effective also in the long run.

SURGICAL TECHNIQUE

Septal surgery in children should in the first place be directed to repositioning of dislocated parts. In the second place it should be as conservative as possible. Resections must be avoided unless they are required for a proper repositioning (Huizing, 1973).

The operation should, as much as possible, be restricted to the cartilaginous septum. The functional problem is almost always located in this part and there is practically no need to correct small bony deviations, bony spurs and spines. From the viewpoint of nasal growth it is probably contra-indicated to touch these at all. The same holds for the small deviations of the bony pyramid that are often present.

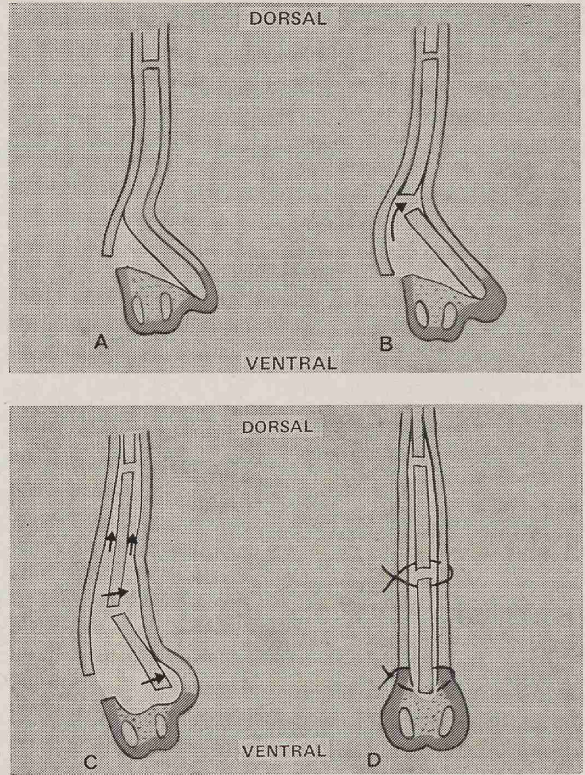
Personally, I only correct deformities of the bony pyramid and of the bony septum in children with an acute trauma.

The cartilaginous septum is best approached via a right hemitransfixion.

In the case of a *vertical* fracture or bend the mucoperichondrium is elevated, up to the fracture and down to the caudal end. At the place of the fracture an incision is made into the cartilage along the full length of the bend. From this point on a bilateral septal tunnel is made as far as required. (Figures 1a, b). In order to allow repositioning, a vertical strip is resected in the region of the fracture and the two parts into which the cartilaginous septum is now

Figure 1.
Correction of a vertical fracture.

- a. right septal tunnel.
- b. incision of fracture.
- c. mobilization of ventral part of cartilage to the left, bilateral tunnel dorsally from incision of cartilage, resection of vertical strip at fracture region and caudal end.
- d. repositioning and fixation.



divided, are freed from their bases and mobilized. A proper repositioning mostly requires some shortening of the caudal end and the removal of a basal horizontal strip. The mobilized and repositioned parts are fixed by means of two or more transeptal and septocolumellar sutures (Figures 1c, d).

In the case of a *horizontal* fracture or bend the same principles are applied. The fracture is approached from above and a cut is made through the cartilage just above it (Figures 2a, b). A tunnel is made on the other side and two horizontal strips are resected, one cranially from the fracture, the other at the joint area.

A limited resection of the bony premaxillary wing on the opposite side may be necessary (Figures 2c, d).

LONG-TERM RESULTS

The long-term results of septal surgery can be considered satisfactory. The principal requirement for a good result seems to be a conservative technique in which resections have been limited as much as possible. Sufficient improvement of nasal breathing was obtained in about 80% of our patients.

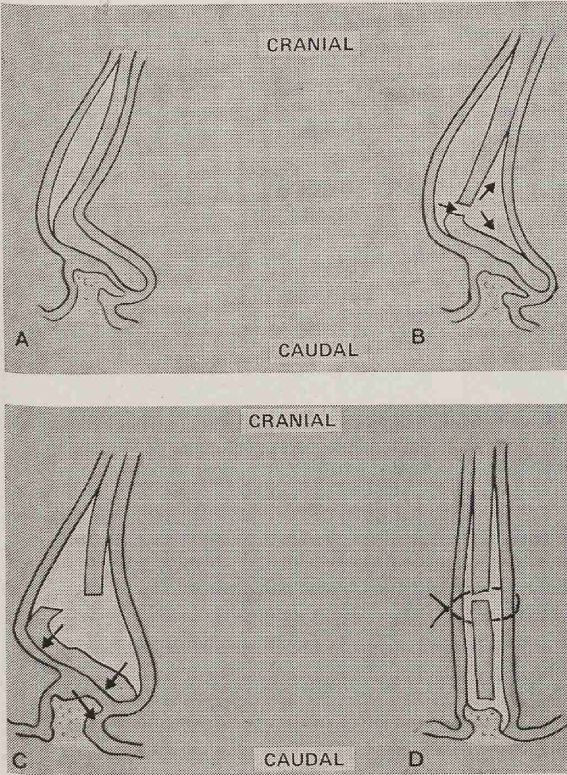


Figure 2. Correction of a horizontal fracture.

- a. right septal tunnel.
- b. incision of fracture, tunnels on the left.
- c. resection of horizontal strip at fracture region, conservative resection of cartilaginous and bony spur.
- d. repositioning and fixation.

In some cases a secondary operation was carried out within 1-2 years, in others re-operation was postponed.

A reduction in nasal growth was seen in a number of cases in spite of conservative surgery. In how far this effect had been produced by the operation or by the previous trauma could not be established. We got the impression, however, that with some children it might have been the result of surgery. This has urged us to be even more conservative.

The following case history with a follow-up of 15 years may illustrate the advantages and disadvantages. Patient P. V. was born in 1959. He fell from the stairs at his home at the age of two which resulted in a vertical septal fracture, which was not treated at the time. In 1963, when he was four years old, he was referred to us because of a complete obstruction on the left side of the nose and a partial blockage on the right. His mother also observed a deviation of the external pyramid to the right (Figures 3a, b).

Conservative septal surgery was carried out according to the principles described above. The result three months after surgery was completely satis-



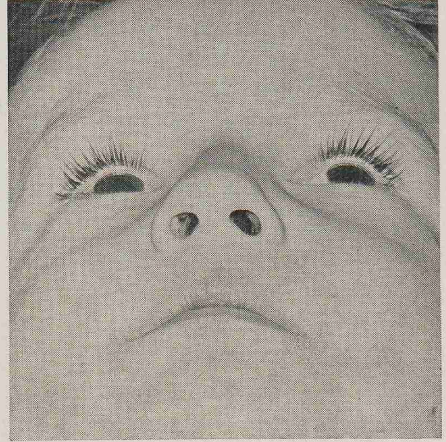
a



b



c

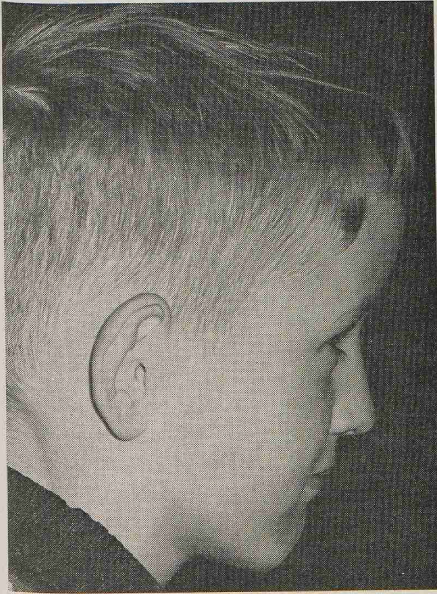


d

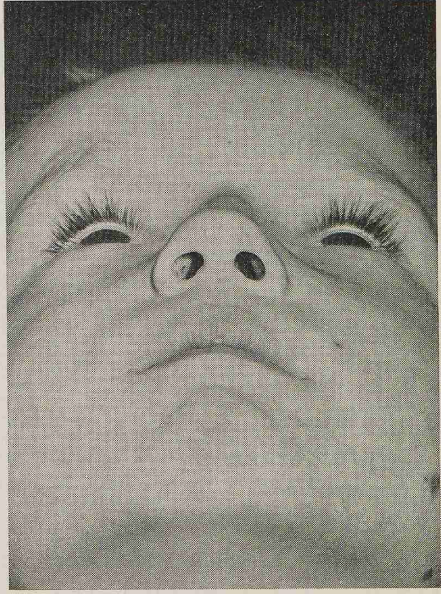
Figure 3. P. V. born 1959, before (a, b) and 3 months after (c, d) conservative septal surgery at the age of 4.

factory from the functional as well as from the cosmetical point of view (Figures 3c, d). Three years later, at the age of 7, his nose showed a normal development in all directions. There were no functional complaints (Figures 4a, b). At the age of 10 a further normal development could be seen (Figures 5a, b).

However, in 1975, when he was 16 years of age, some reduction in growth of the external pyramid especially in its ventral direction became apparent. A moderate cartilaginous sagging and a linea nasalis had developed, while the lobule had broadened. The septum was in the median plane and nasal

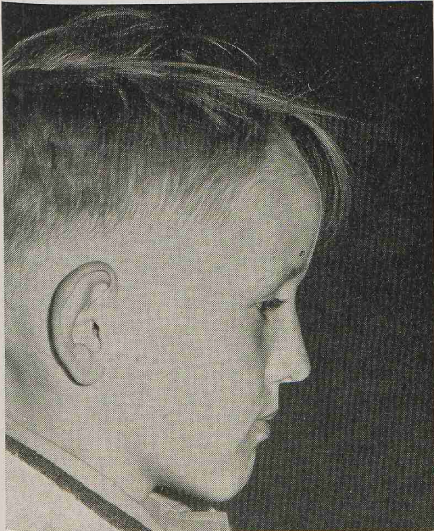


a

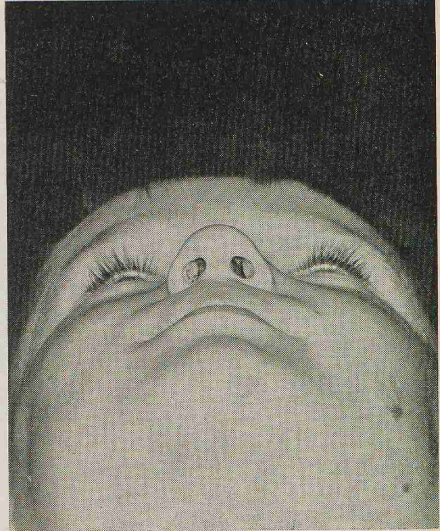


b

Figures 4a, b. Seven years old. Three years postoperatively: normal function and growth.

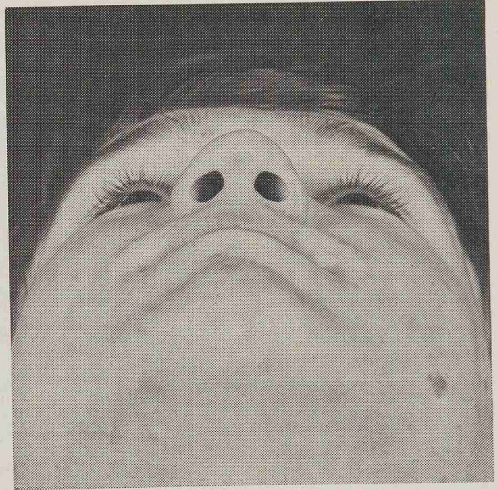
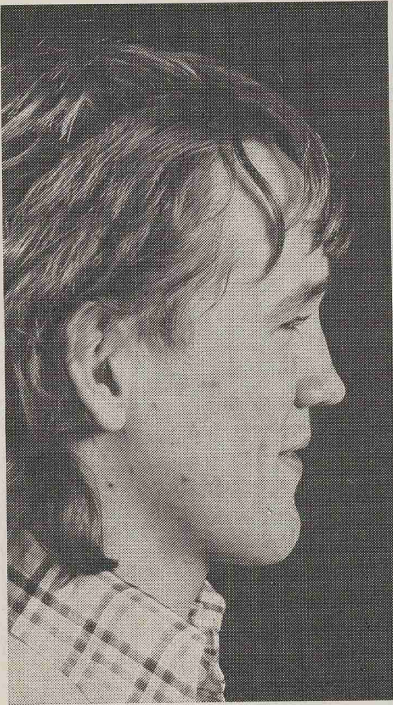


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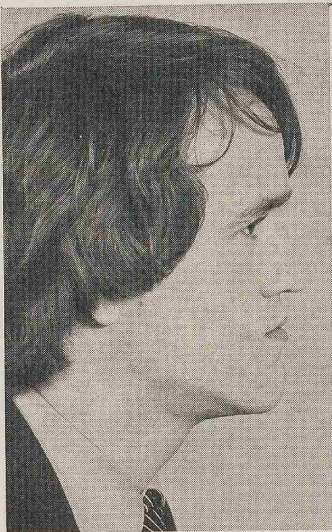
b

Figures 5a, b. Ten years old - six years after surgery: further normal development



b
a

Figures 6a, b. Sixteen years old. Septum in median plane, function unimpaired. Some reduction of growth of external pyramid: moderate cartilaginous sagging, broadening of the lobule.



b
a

Figures 7a, b. Nineteen years old, three months after additional correction of the dorsum.

breathing was optimal (Figures 6a, b). This observation is a practical illustration of the conclusion of Verwoerd c.s. that, if problems arise, the greatest chance is during the growthspurt in puberty.

At the age of 19, this limited deformity had become more pronounced and an implantation of bank cartilage was carried out for cosmetic reasons. The septum appeared to be normal and needed no secondary surgery (Figures 7a, b).

The case of this boy seems to me a good average example of what we can be expected of septum surgery in children if it is carried out really conservatively: good results from a functional point of view, acceptable results from the viewpoint of nasal growth.

If the children are followed up over the years, it appears that some need a secondary intervention, sometimes in childhood, more often after puberty. This price is low if compared with the important functional improvement that can be achieved by early conservative septum surgery.

RÉSUMÉ

Ce travail résume l'expérience de l'auteur concernant la chirurgie du septum nasal chez l'enfant pendant les années 1963 à 1978. Quelques 150 enfants ont été opérés et beaucoup d'entre eux ont pu être suivis.

Une déformation septale avec difficultés respiratoires au repos constitue une indication de chirurgie conservatrice quel que soit l'âge des patients.

Lorsqu'il y a seulement des difficultés respiratoires au cours de l'effort, d'autres facteurs (âge, déformations externes, psychisme) interviennent pour prendre la décision opératoire. Les déformations septales sans plainte fonctionnelle ne sont pas opérées. La prévention d'une déformation de croissance peut être un facteur à considérer pour prendre une décision opératoire. Les fractures récentes, les hématomes de la cloison et les abcès sont des indications indiscutables pour la chirurgie.

La technique chirurgicale utilisée dans les deux types les plus fréquents de déformation est décrite.

La surveillance d'un garçon opéré à l'âge de 4 ans est présentée au cours d'une période de 15 ans. Le nez se développe normalement jusqu'à la puberté. Ensuite, un certain trouble de croissance devient apparent.

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