

Deformities of the nasal septum in human foetuses

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SUMMARY

In a series of 50 embryos and foetuses ranging from 20 mm to 190 mm in length two foetuses of 34 and 37 mm (48 to 50 days old) were found, that presented deformities of the septum of the cartilaginous nasal capsule, representing 4% of our material. The deformities consisted of curves of the nasal septum, located to both vomeronasal nerves.

We therefore think that this study is interesting because it adds a new factor, the congenital one, to the etiology of deformities of the nasal septum.

INTRODUCTION

Septal deformities form an important part of the pathology and surgical therapy of the nose. This kind of lesions frequently occur and are responsible for a very large number of nasal alterations.

In fact, several authors have already dealt with this problem (Freer, 1905; Ali, 1965; Montserrat et al., 1967). They all studied and classified septal deformities that could become pathological and pointed to the fact that septal deformities seldom occur in children. Ali did not find a single case younger than one year of age. In Freer's series, the youngest patient was eight years old, and in Montserrat's, the youngest was four.

All this is sufficient proof that septal deformities are not frequently seen in children, which is the reason why it is believed that most deformities seen in adults are due to a trauma or a disorder in growth bringing about an unbalance and asymmetrical development of the different parts of the nose and hence of the septum itself. Stevens (1970) stated that such unbalance may be due to a previous trauma. Gray (1977, 1978), reviewing 2,830 newborns, studied the deformities of the septum and found 60% malformations, 4% of which were in the anterior part, whereas the other 56% were combined deformities of the septum and the floor of the nasal fossae, palate, mandible etc. They stated that these were due to compressions in the last months of pregnancy and during birth.

However, some authors also mention that septal deformities may already be present in the human embryo (Keith, 1948; Pulido, 1960). Their research is interesting since it reveals the possibility of congenital deformities of the septum. Our examination of the human embryos and foetuses made it possible to study the existence of septal malformations described in this paper.

MATERIAL AND METHODS

We made a study of 50 embryos, their length ranging from 20 to 30 mm. They all belong to the collection kept at the Department of the Anatomy of the Medical School of Barcelona. Two foetuses with septal malformations were found, which is 4% of our material.

All specimens were fixed in formaldehyde 10%, and cut either in cross- or frontal-section at 10 microns thickness; the even sections were then stained with hematoxylin-eosin and the odd sections with Mallory-Azan.

OBSERVATION

The results can be divided into two parts: those found in foetuses with deformities of the nasal septum and those found in normal foetuses.

Foetuses with deformities of the nasal septum

The following table gives some relevant data about the malformed foetuses:

foetus	length vertex-coccyx	age	section
A	34 mm	48-50 days	cross-section
GM ₂	37 mm	48-50 days	cross-section

The histological examination of the sections going through the cephalic regions of these foetuses proves the existence of abnormal curves of the nasal septum being still in its cartilaginous stage.

Figure 1 shows a section of foetus A involving the nasal fossae. Between these fossae the septum nasi shows abnormal curves located close to the vomeronasal nerves, since the serial study of the sections proves that they come from Jacobson's organ.

Figure 2 shows a section of foetus GM₂, giving the details of the cartilaginous nasal capsule. It is seen how the septal portion has more curves than the previous one (Figure 1) and that they are more pronounced in the neighbourhood of both vomeronasal nerves.

Normal foetuses

The detailed examination of the histological sections that go through the nasal fossae of normal embryos in identical or more advanced stages of development enabled us to determine that the septal deformities described above do not exist in this particular stage of development.

Figures 3 and 4 show two foetuses (34 mm and 43 mm length) in a similar or later stage of development. They represent sections involving the nasal fossae. It is clearly seen that the septum nasi shows only a slight curve close to the vomeronasal nerves and not so pronounced as in the two previous cases.

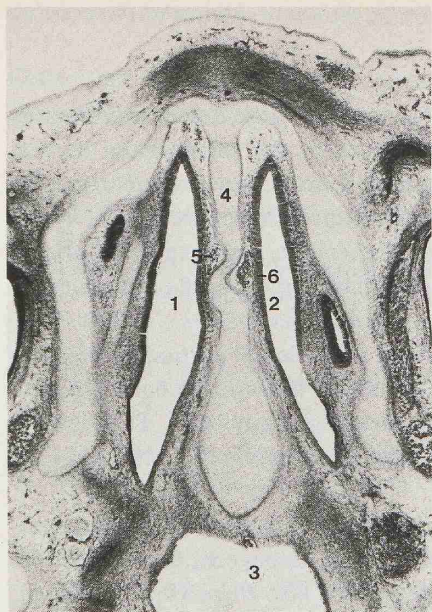


Figure 1. Cross-section of foetus A, 34 mm. 1 and 2 - nasal fossae, 3 - pharynx, 4 - septum nasi with curves, 5 and 6 - vomeronasal nerves.



Figure 2. Cross-section of foetus GM₂, 37 mm. 1 and 2 - nasal fossae, 3 - pharynx, 4 - septum nasi with curves, 5 and 6 - vomeronasal nerves.

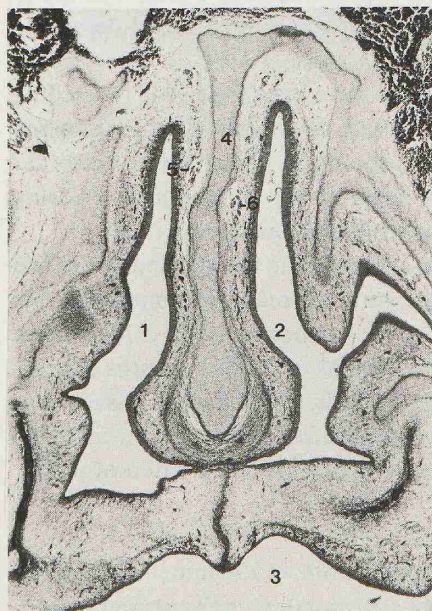


Figure 3. Cross-section of foetus M₇, 34 mm. 1 and 2 - nasal fossae, 3 - mouth, 4 - septum nasi without curves, 5 and 6 - vomeronasal nerves.

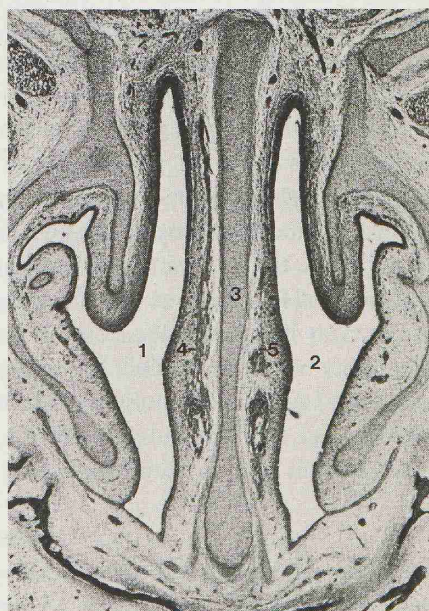


Figure 4. Frontal section of foetus BW₃, 43 mm. 1 and 2 - nasal fossae, 3 - septum nasi without curves, 4 and 5 - vomeronasal nerves.

DISCUSSION

The study of 50 human embryos and foetuses enabled us to detect two foetuses showing septal deformities in the neighbourhood of the vomeronasal nerves. This figure represents 4% of our material. Such deformities are not due to technical insufficiency as they were not present in the controls that were treated by the same procedure. In the latter there was only a slight curve, and not a strong one, in the septum nasi at the same level, which is, in our opinion normal in this particular stage of development.

The above-mentioned deformities were located in the septal portion of the cartilaginous nasal capsule, that is, in that part which will become the perpendicular plate of the ethmoid, once the ossifications process is completed. This process begins in the third or fourth year after birth and it is completed at the age of 25, when it joins the vomer.

These deformities of the nasal septum described are, in our opinion, very interesting because they offer data that help to clarify their pathogeny, despite the fact such deformities are rare not only in children but also in newborns. Indeed, according to the authors that studied this problem (Cottle et al., 1956; Klaff, 1963; Quante et al., 1976; Montserrat, 1971), a luxation of the caudal border of the nasal septum determining its deformity and the pyramid, appears at those ages in a percentage ranging between 1.5% and 5% and is characterized by a lateralization of the tip and unevenness of both nasal airways. For some, such septal deformity could be due to a trauma during birth.

On the other hand, very rare septal deformities have been described (according to Montserrat, 1971, they appear only in 0.5%) with deviations of the septum and lateralization of the tip, the etiology of which should be looked for in a disorder acquired during pregnancy caused by the sides of the continuously pressing against the foetus' limbs which, in turn, deforms the developing nose.

In our cases, the deformities of the septum – considering the age and size of the embryos and foetuses – cannot be explained by any traumatic or compressive factor, as Gray had concluded from his study of the newborns (1977, 1978). Such a possibility would be feasible if they were specimens of the last months of pregnancy, and were accompanied by deformities in the floor of the nasal fossae, mandible, palate, etc. This adds, therefore, a congenital factor to the deformities of the nasal septum seen in clinical practice, the etiology of which is often obscure.

RÉSUMÉ

En étudiant 50 embryons qui mesuraient entre 20 mm. et 190 mm. on n'a trouvé deux, un de 34 mm. et l'autre de 37 mm. (48 à 50 jours) qui présentaient des difformités du septum de la capsule cartilagineuse du nez, ce qui signifie le 4% du total. Les difformités consistaient en incurvation du septum situées contre les nerfs vomeronasaux.

Cette étude suggère l'existence d'un facteur congénital dans l'étiologie inconnue des difformités septales.

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