Mesiodens and Impacted Incisor in Each of Monozygotic Twin Sisters: A Report of Two Fully Concordant Cases

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Abstract

An extremely rare case is reported where monozygotic twin sisters, with a mesiodens in each and impacted unerupted upper left incisor, show a high degree of co-twin concordance. Since 1963, two analogous cases of monozygotic twin sisters have only been recorded, and six analogous cases of monozygotic twin brothers. The high degree of concordance observed seems to indicate that the sisters have avoided any significant effects of epigenetic origin, and their case provides evidence in favor of genetic factor in the etiology of mesiodentes.

Introduction

As far as supernumerary teeth are concerned, the occurrence thereof is most frequent in the vicinity of maxillary midline, within the region of upper central incisors. Such a tooth is usually referred to as a mesiodens (pl. mesiodentes). Only rarely do mesiodentes erupt within permanent dentition (about 25%), and, if unerupted, their presence can seriously impair the eruption pathway of incisors at nearby locations; it was first detected by Brodie, in 1936. Mesiodentes occur singly or in pairs, and can assume various shapes, with or without roots developed: conical (most frequent, about 60%; the dominant form of erupted mesiodentes), incisiform (similar to that of a typical incisor, about 40%; sometimes called supplemental, if the root has been formed), and, sparsely, tuberculate (with tubercles, like in premolars). They can be found in deciduous, permanent or mixed dentition; in deciduous dentition, there seems to be no preference of either sex, but males do show a preference of 2:1 with respect to females if permanent dentition is concerned.

Various theories have been brought forth regarding the etiology of mesiodentes. One of these invoked a concept of a phylogenetic relic of extinct pre-ancestors with three maxillary central incisors. Dichotomy of tooth buds, where one of the fragments evolves into a mesiodens, was suggested as the origin, while another theory assigned this role to hyperactivity of maxillary lamina. Needless to say, lacking firm experimental proofs, such theories hardly escape a demesne of hypotheses or suppositions. As far as genetic and inheritance aspects are concerned, it is easier to look for experimental evidence, and a theory of an autosomal dominant trait with incomplete penetrance of generations, presented in 1969 by Sedano and Gorlin, has often been referred to. However, one can hardly believe in any simple picture or mechanism of the processes involved, in view of a fairly extensive study, of 2005, of 278 monozygotic twin pairs, taken from the Caucasian population of Australia. Mesiodentes were found in 9 twin pairs, but among the latter there was just a lone case of concordant anomalies in co-twins; the other 8 pairs were co-twin discordant. The authors, with due caution, draw attention to epigenetic temporal factors which are likely to pave ways to fortuitous disturbances in dental growth whose rates are nonuniform throughout the whole of dentition.

Studies of monozygotic twin pairs with mesiodentes and concomitant impaired or delayed eruption of incisors, if the anomalies do show co-twin concordance, can provide serious arguments relating to the etiology of mesiodentes. Unfortunately, such observations are extremely rare, possibly owing to the role of epigenetic factors, already referred to in the foregoing. Within the years 1963-1997, only six relevant cases were reported, from Belgium, Norway, Germany, United Kingdom, China, and the Caribbean, and these were duly summarized in the cited article. Since then, there have only been three reports, from Turkey, Australia, and the present report from Poland, which make a total of 9 examples of monozygotic twin pairs, with mesiodentes and concomitant anomalies, where the pairs were rated as co-twin concordant, near concordant or mirror imaged; all of this relates to the timespan 1963-2011. One should notice that mesiodentes are not mentioned in a number of articles which describe co-twin concordant dental anomalies in monozygotic twin pairs.

Case Report(s)
In April 2010, monozygotic twin sisters, AD and LD, were referred to our department for treatment of delayed eruption of upper left incisor (ULI, 21) in each. Aged 8 years 5 months, born after 38 weeks of gestation, first AD (weight 2.8 kg), two minutes later LD (weight 2.9 kg), were incubated for 48 hrs after birth in view of some respiratory problems. The family history failed to reveal any presence, in the pedigree, of supernumerary teeth or other dental anomalies; there were no records, either, of any serious ailment or anomaly.

Pretreatment facial photographs of AD and LD are shown in illustrations 1 and 2.

Pretreatment intraoral photographs (illustration 3) show the following pattern of erupted dentition:

Erputed teeth in AD:
16,15,54,53,11;61,62,63,64,65,26
46,85,84,42,41;31,32,73,74,75,36

Erputed teeth in LD:
16,55,54,12,11;61,22,63,64,65,26
46,85,84,42,41;31,32,73,74,75,36.

Pretreatment radiographs, panoramic, occlusal, and periapical (illustrations 4, 5, and 6, respectively), revealed the following features in each twin:

Incisiform mesiodens with its root developed; root tip in maxillary midline, mesiodens left tilted, its crown within ULI (21) eruption pathway

Unerupted, impacted by mesiodens, permanent upper left incisor (ULI, 21)

Retained erupted deciduous upper left incisor (61)

Normal, erupted permanent upper right incisor (URI, 11)

These features obviously imply a high degree of co-twin concordance within the region concerned.

In the treatment procedure employed, the deciduous incisor was extracted, the mesiodens was surgically removed, and the delayed ULI (21) was brought, by means of orthodontic traction, to the surface of the alveolar ridge involved. The latter included a bracket bonded onto the labial surface of ULI, linked by elastic ligature to a removable appliance in the lower arch. In the outcome, ULI edge surfaced at the alveolar ridge after 7 months in AD, and after 9 months in LD. As soon as the crown is duly erupted, further orthodontic procedures will be applied in order to align ULI(21) within the arch.

Discussion

The present case of co-twin concordant monozygotic twin sisters with mesiodentes in the pretreatment stage shows some distinguishing features, as compared with the other 8 cases. Here, the concordance is deep reaching, and includes, as far as the mesiodens is concerned, the central location of its root tip, its left tilt, its incisiform shape with the root developed as well as the concomitant impaired eruption of the permanent upper left incisor; the same relates to the retained deciduous upper left incisor. Additionally, the erupted permanent upper right incisor neatly completes the concordance within the region. Thus, from this point of view, the twin couple may be rated as fully concordant; a comparable rating may only be assigned to one of the previous examples, while two of the latter revealed some discordant shapes and three involved mirror imaging. It is noteworthy that twin sisters are presently reported; so far, two monozygotic co-twin concordant female pairs with mesiodentes have only been recorded since 1963.

If we combine the present case with those so far reported, there are 6 pairs of monozygotic twin brothers, and only 3 pairs of sisters. Curiously enough, this perfectly matches the 2:1 ratio of male-to-female mesiodens occurrence within permanent dentition in the general population. Obviously, the perfect coincidence is most probably fortuitous, in view of the small sample size, but it certainly does not deny the commonly accepted distribution thereof between the sexes.

Conclusion

The monozygotic twin sisters from the present example seem to have avoided any significant effects of epigenetic origin, those considered by Townsend et al. and referred to in Introduction. The co-twin concordance is high within the region of anomalies concerned, and the present report provides experimental evidence in favor of the role of genetic factor in the etiology of mesiodens.

References

2. Babacan H, Oztürk F, Polat HB. Identical unerupted
Illustrations

Illustration 1

Pretreatment facial photographs of AD

Illustration 2

Pretreatment facial photographs of LD
Illustration 3

Pretreatment intraoral photographs of AD and LD

Illustration 4

Pretreatment panoramic radiographs of AD and LD
Illustration 5

Pretreatment occlusal radiographs of AD and LD

Illustration 6

Pretreatment periapical radiographs of AD and LD
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