Letter to Editor

Oligodontia with Taurodontism in Monozygous Twins

Dear Editor,

A wide spectrum of developmental pathologies affects the teeth, which includes variation in shape, size, eruption pattern, and number. Tooth agenesis is one such condition that leads to hypodontia and oligodontia. Prevalence of hypodontia was found to be 1.6% to 9.6% in the permanent dentition. Oligodontia is a developmental absence of 6 or more teeth excluding third molars, which affects less than 0.5% of the population.[1-3] The presence or absence of one or more teeth is decided by genetic and hereditary backgrounds and are expressed with different degrees of severity. It can be associated with microdontia, changes in tooth morphology, delayed and ectopic eruption.[3-5] Although oligodontia in monozygous twins has been reported in the previous literature, its association with microdontia and taurodontism has not been reported elsewhere.

22-year-old twin sisters reported to our department with a complaint of spacing between the teeth since childhood. Their familial, prenatal, and natal histories were non-contributory. Extra-oral examination of identical twins showed normal features. On intra-oral examination, oral mucosa appeared normal in both cases. The common dental features observed in both the twins were generalized reduction in dimensions of teeth, absence of third molars in both the arches, conical shaped canines, and taurodontism in mandibular first molars.

The oral features observed in twin 1 were generalized microdontia with spacing, missing teeth in relation to 12, 17, 18, 22, 27, 28, 37, 38, 42, 47, 48 and conical-shaped 33 and 43 [Figures 1a and b]. Her panoramic radiographic features were consistent with clinical findings. Both the mandibular first molars were taurodonts. [Figure 1c] Other radiographs like skull, chest, and hand wrist showed no abnormalities.

Twin 2 on intra-oral examination showed generalized microdontia, missing teeth in relation to 12, 22, 17, 18, 27, 28, 32, 45, 37, 38, 47, and 48, conical-shaped 13 and 23. A retained tooth in relation to 85 was noticed [Figures 2a and b]. Panoramic radiograph revealed absence of all the permanent teeth that were clinically missing along with missing third molars in all the quadrants [Figure 2c].

Considering the history, clinical and radiographic findings, a diagnosis of oligodontia with microdontia and taurodontism was arrived at. The condition was explained to the patients, and a genetic counseling was advised. For esthetic and masticatory function, an orthodontic treatment was recommended.

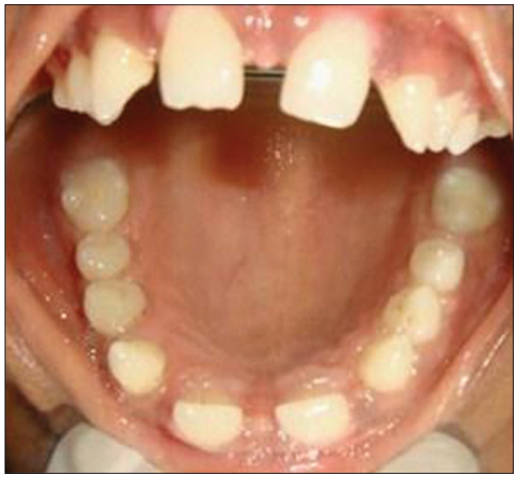

Figure 1a: Maxillary arch showing missing 12,17, 22, 27

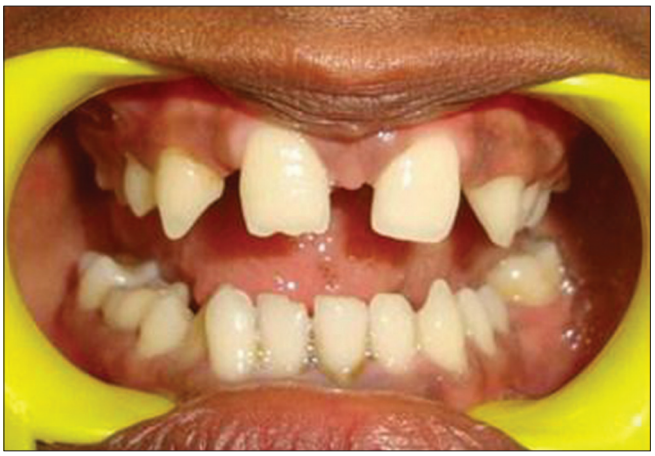

Figure 1b: Mandibular arch showing missing 37, 42, 47

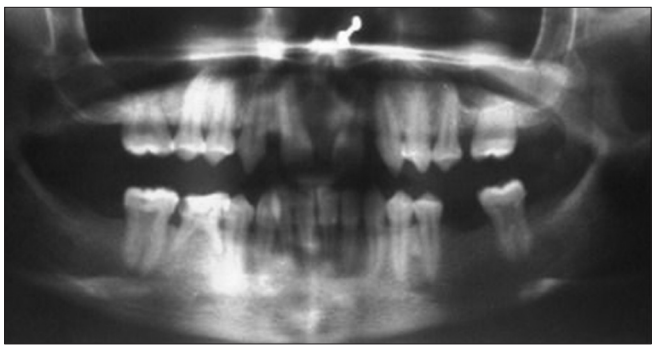

Figure 1c: Panoramic radiograph showing missing 12, 17, 22, 27, 37, 42, 47. Taurodontism with 36 and 46

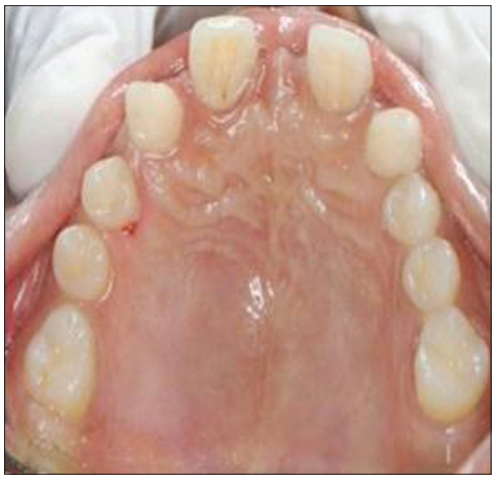

Figure 2a: Maxillary arch showing missing 12, 22, 17, 27, and Generalized spacing with Microdontia

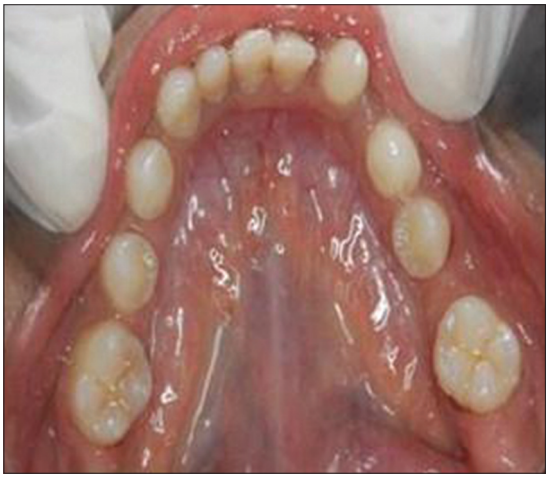

Figure 2b: Mandibular arch showing missing 37, 45, 47, and Generalized spacing with Microdontia

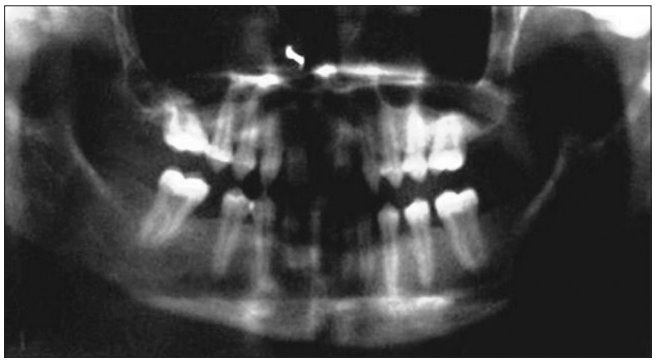

Figure 2c: Panoramic radiograph Showing missing 12, 22, 17, 27, 37, 45, 47. Taurodontism with 36 and 46

Tooth agenesis is caused by genetic and environmental factors. Developing teeth are affected by environmental factors such as chemotherapeutic drugs, radiation therapy, fractures, and intrauterine disturbances. Surgical procedures and lack of necessary space on the jaws also plays a role in causing anodontia.[5] However, none of these environmental factors attributed to oligodontia in our case.

In familial hypodontia, the type of inheritance seems to be autosomal-dominant with incomplete penetration and variable expressivity.[4] Oligodontia is caused by mutations in PAX9, MSX1, AXIN2, EDA, EDAR, EDARADD, and WNT10A. However, the vast majority of cases of tooth agenesis is less severe and may be the result of hypomorphic genetic variations in multiple genes. The homebox genes as well as alteration in epithelial mesenchymal interactions could lead to tooth agenesis.[6]

A genetic etiology associated with oligodontia alerts the clinician about the importance of family history after ruling out any possible environmental factors and systemic syndromes.[7,8]

As Monozygotic twins showed a significantly higher concordance rate for hypodontia than the dizygotic ones, our case was in favorable towards the genetic concept found in monozygotic twins with similar pattern of oligodontia.

Tooth agenesis is frequently associated with microdontia. A reduction in tooth size represents an incomplete expression of the same genetic defect. In patients with oligodontia, the reduction of tooth size is even more remarkable.[7-9] This was in accordance with the present case.

In the present case, monozygotic twins had agenesis of 7 teeth excluding third molars with microdontia. The similarities in the agenesis of teeth had suggested the possibility of a genetic influence. Environmental factors may also play a minor role in differences of dentitions in twins. In present case, twin 2 showed retained 85 in contrast to twin 1, which could be due to environmental factors. In addition to tooth agenesis, twins had generalized microdontia with spacing and taurodontism.

Seow and Lai[10] found that 38.4% of patients with hypodontia had taurodontism in one mandibular first molar compared with only 7.5% without hypodontia. This was in favor of our report, as taurodontism was associated with hypodontia in both the twins.

The treatment of oligodontia aims at improving the patient's appearance, speech, masticatory efficiency, and psychological feeling by replacing the missing teeth with multidisciplinary approach.[6] Early recognition of this condition is vital to provide adequate treatment and prevent mal-occlusion. Restoration with removable and fixed partial denture, implant retained prosthesis or a combination of these therapies are the treatment options. However, in the present case, fixed

orthodontic treatment was instituted and recalled for follow-up.

This case report describes similar tooth agenesis, microdontia, and taurodontism in monozygotic twins. These dental anomalies are frequently encountered in different individuals, and it is rare to see them together in a physically normal child. Genetic link associated with oligodontia help the dentist to know the possibility of its occurrence in other family members and in future generations. Proper treatment at the appropriate time should be instituted to avoid psychological, esthetic, and functional consequences in patients with oligodontia.

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