A multidisciplinary approach to the management of a maxillary midline diastema: A clinical report

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**Introduction**

Anterior maxillary spacing has been shown to be one of the most negative influences on self-perceived dental appearance, and a maxillary midline diastema (MMD) is commonly cited by patients as a primary concern during dental consultations. MMD has been defined as a space greater than 0.5 mm between the mesial surfaces of the 2 maxillary central incisors. An MMD greater than 2 mm in the mixed dentition is unlikely to spontaneously close. African Americans are more than twice as likely to have an MMD than whites or Hispanics. In esthetic situations, without a comprehensive smile analysis and proper planning, overtreatment and undesirable effects can occur. Tooth size especially has been emphasized as the primary element of an esthetic smile design. One method of establishing tooth size is tooth biometry as described by Chu. He reported that maxillary anterior tooth widths average 8.5 mm for central incisors, 6.5 mm for lateral incisors, and 7.5 mm for canines and that 80% of the patient population falls within ±0.5 mm of these values. Other important elements of smile analysis include the dental midline, tooth morphology, axial inclinations, and the soft tissue components of gingival health, levels, and harmony. The direct bonding technique is a straightforward, conservative method for diastema closure. However, artistic skills, a knowledge of tooth morphology, and the appropriate selection and use of composite resin materials are essential for success. According to Spear and Kokich, “some existing dentitions simply cannot be restored to a more pleasing appearance without the assistance of several different dental disciplines.” Therefore, complex esthetic dilemmas may require more than one dental discipline, for example, operative dentistry and orthodontics, to establish a functional, maintainable, and pleasant smile. This article illustrates a clinical situation in which an MMD was addressed by first completing a comprehensive smile analysis, followed by closure using limited orthodontics and direct composite resin restorations.

**Clinical Report**

A caries-free, 32-year-old woman presented to clinic expressing unhappiness with her smile because of the spaces between her anterior teeth. The smile analysis revealed a 3-mm diastema between the maxillary central incisors, 0.5-mm diastemas between the maxillary canines and lateral incisors, an average smile line with 75% to 100% of the clinical crown height of the maxillary incisors displayed, disharmony in the shape of the central incisors (square) compared with the other maxillary anterior teeth (triangular). A trial restoration demonstrated that treatment with composite resin increments would only create excessive width of the central incisors and a black triangle. Therefore, a multidisciplinary treatment plan was formulated that included limited orthodontic treatment followed by diastema closure with direct composite restorations. Orthodontic treatment focused on reducing the MMD from 3 mm to 1 mm. After bonding standard edgewise brackets to the maxillary central incisors, the MMD closure was carried out by using form I round 0.018-inch stainless steel wire combined with a short (H6) memory chain. After 6 weeks of treatment, the MMD measured 1 mm and even spaces had been created between the maxillary central and lateral incisors. The diastematas between the lateral incisors and canines were first restored using a free-hand layered composite resin technique, with no preparation of the teeth needed. A polyvinyl siloxane lingual matrix was fabricated to restore the central incisors from a new diagnostic waxing created after the orthodontics. The finishing process was initiated with coarse and medium-coarse disks by following the natural contours of the teeth. Fine and extra-fine diamond rotary instruments were used for texture and microanatomy. The final esthetic evaluation of shade and texture of the restoration was done 15 days postoperatively.

**Discussion**

All treatment options for diastema closure should be considered and presented to the patient. This patient was previously aware of indirect restorations as the only treatment option and expressed reservations about cost and tooth preparation. To close the diastematas with orthodontics alone would have required comprehensive orthodontic treatment, which would not have addressed the tooth shape discrepancy. The esthetic smile analysis was imperative in the formulation of a treatment plan, and establishing proper tooth proportions presented a challenge. With limited orthodontics, the MMD was reduced to 1 mm. Using the principles described by Chu, the central incisors were restored to an 8.5-mm width with composite resin restorations. Using limited orthodontics for MMD closure with segmental arch wire from central incisor to central incisor in conjunction with an elastomer chain is predictable, as long as retraction of the incisors is not required. After orthodontic treatment, composite resins were used not only to close the remaining MMD but also to stabilize the teeth. While periodontal surgery is an option for creating a papilla, for this patient, the interradial gingiva between the central incisors was “squeezed” together with movement of the teeth.

**Bibliography**