

Case Report: Correction of mandibular asymmetric prognathism

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Mandibular asymmetry is very common¹ and may create both esthetic concerns and functional irregularities.² In fact, mandibular asymmetry has been found in 41% of males and 40% of females.¹

Patients seeking orthognathic surgery generally have a discrepancy that is evident to them, but have also been shown to have craniomandibular functional patterns different from those of a normal group or healthy population.² TMJ disorders may also be present.

Correction of dental asymmetries can be accomplished with orthodontic treatment alone and clinicians routinely provide therapy to camouflage skeletal discrepancies.³ On the other hand, a

multidisciplinary approach combining orthodontic treatment and orthognathic surgery is also becoming routine.⁴ This case report shows a patient who required a combined approach to treatment.

The patient presented at age 13 years 2 months. Her mother reported that the family dentist had said that the patient's "lower jaw is now protruding and her teeth are out of alignment." At that time, the patient had a full permanent dentition excluding third molars. She had a Class III dental relationship on the left side. There was obvious mandibular deviation to the right, a 5 mm mandibular right midline discrepancy and crossbites of $\overline{5432}$. A right temporomandibular joint pop,



Figure 1A

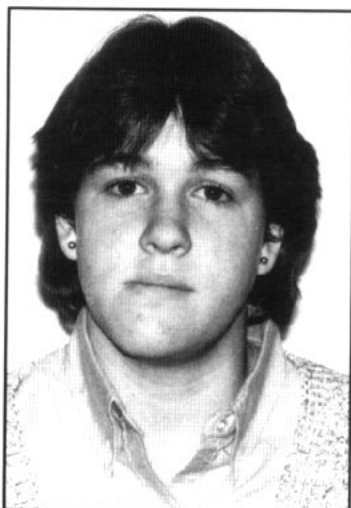


Figure 1B

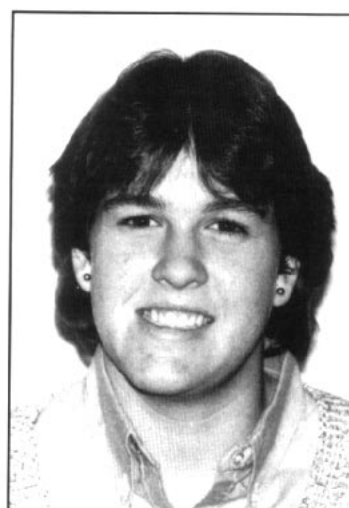


Figure 1C

Figure 1A-C
Facial asymmetry is obvious at 16 years 2 months.



Figure 2

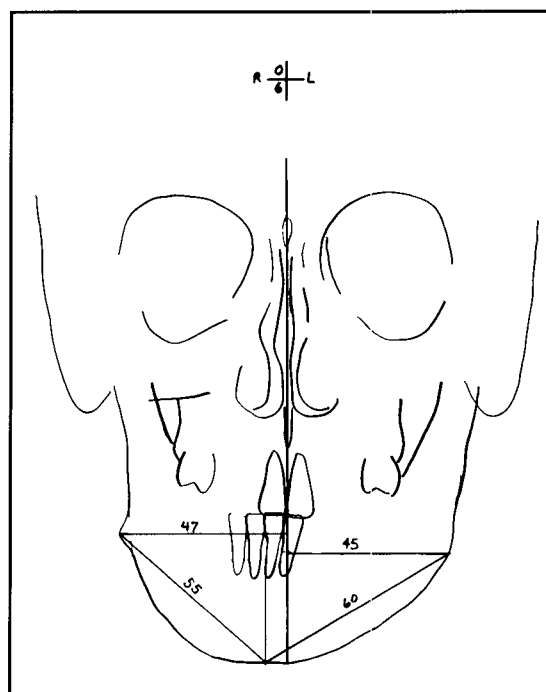


Figure 3

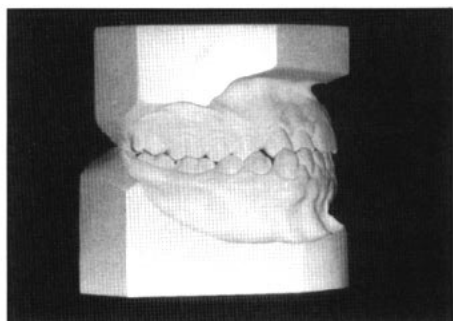


Figure 4A

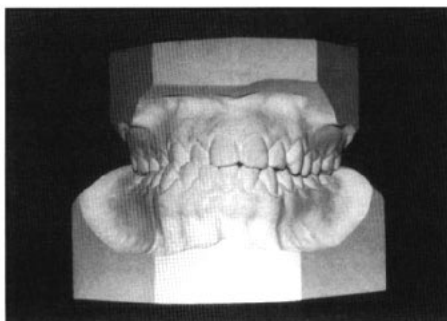


Figure 4B

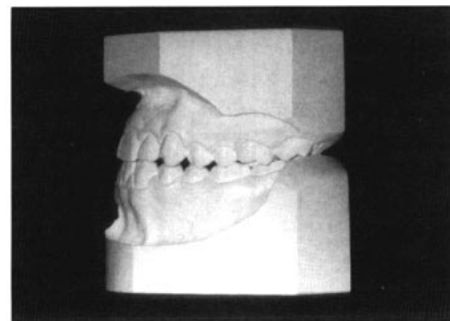


Figure 4C

Figure 2
Pretreatment cephalometric tracing.

Figure 3
Note the 6 mm midline deviation on AP tracing.

Figure 4A-E
Pretreatment study casts.

Figure 5
Marked mandibular asymmetry combined with prognathism.

Figure 6
Pretreatment panoramic radiograph.

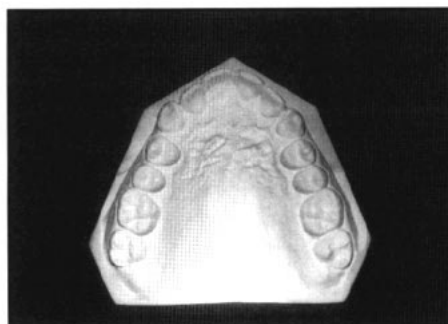


Figure 4D

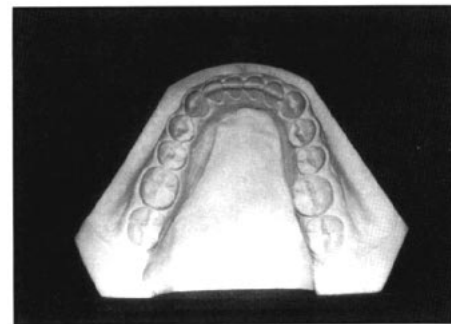


Figure 4E



Figure 5



Figure 6



Figure 7A

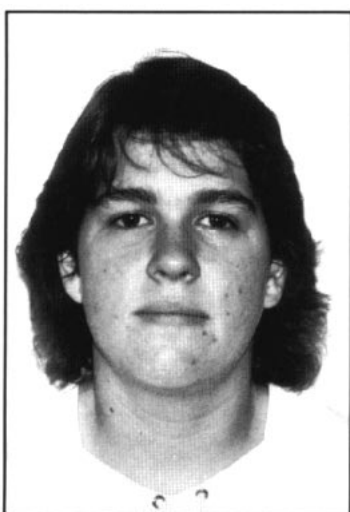


Figure 7B

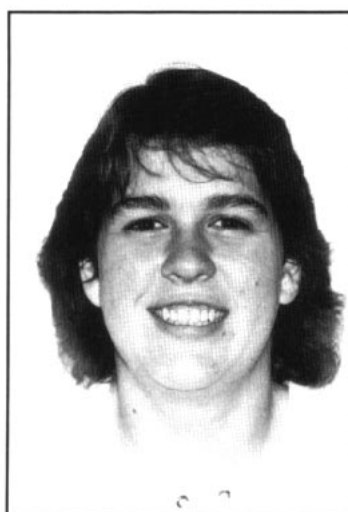


Figure 7C

Figure 7A-C
Posttreatment photographs at 19 years 2 months.

Figure 8
Occlusal symmetry is achieved following combined orthodontic/surgical approach.

which was not a reciprocal click, was evident. Lateral deviation of the mandible to the right upon opening was noted. Maximum interincisal opening was 40 mm.

Based on this preliminary clinical impression, the patient was told she needed orthognathic surgery to reduce the skeletal disharmony, but that treatment should be delayed to allow further growth to occur. She was advised to return if TMD symptoms appeared, and was placed on recall for 1 year.

Upon 1 year recall at age 14 years 3 months, the occlusal and facial findings were unchanged. Significant facial growth was diminishing and the recommendation was to begin orthodontic treatment at age 15 with surgery planned at age 16.

The patient returned at age 16 years 1 month with 25 mm maximum interincisal opening and an apparent right TMJ closed lock. She appeared physically mature and there was no increase in statural height since the last appointment. Initial orthodontic records were recommended, including an AP headfilm to assess lateral facial symmetry.

Diagnosis

The diagnostic records disclosed an Angle Class I skeletal pattern, but with an ANB=1°. The AP headfilm showed an approximate 7 mm right deviation of the mandible with a 6 mm midline discrepancy. The occlusal plane was only marginally affected, slightly superior on the right. Arch length appeared adequate for the dentition with only mild dental irregularity. Labial crossbites of 54321/ were present.

Treatment goals

Goals outlined prior to treatment included the following:



Figure 8

1. Reduce TMD symptoms to allow normal functional activity.
2. Correct the skeletal asymmetry.
3. Correct the dental malocclusion.

Treatment plan

1. Fabricate a mandibular splint to reduce TMD symptoms and serve as a diagnostic aid.
2. Obtain TM joint radiographs.
3. Refer to an oral surgeon for pretreatment consultation and extraction of third molars.
4. When TM joint symptoms stabilize, evaluate for comprehensive nonextraction orthodontic treatment with mandibular asymmetric setback.

Treatment progress

The proposed procedures, alternatives, and risks were explained to the patient and her mother. A soft diet was recommended earlier when the patient presented with a closed lock and it wasn't long before she could open fully without discomfort.

A mandibular splint was constructed and the patient wore it full time. Within 2 weeks the patient was comfortable and a 2-3 mm right CR-CO shift was evident. After 2 months without symptoms the patient wore the splint days only and saw the oral surgeon for evaluation. Third



Figure 9

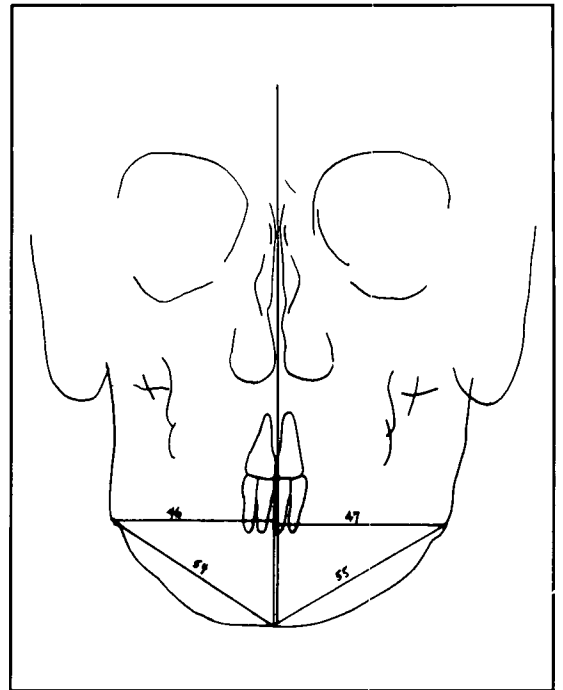


Figure 10

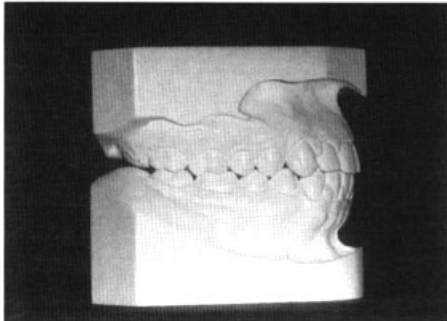


Figure 11A

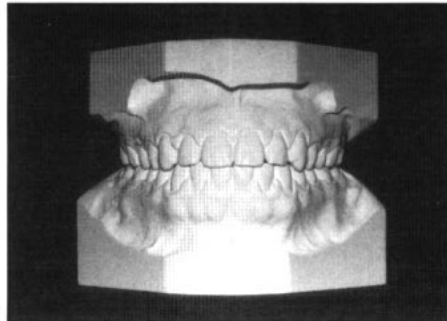


Figure 11B

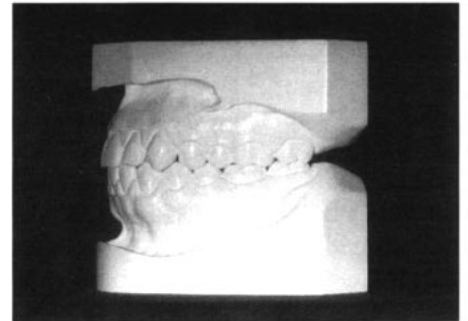


Figure 11C

Figure 9
Posttreatment cephalometric tracing at 22 years 9 months.

Figure 10
Posttreatment AP tracing shows correction of mandibular asymmetry.

Figures 11A-E
Study casts taken 43 months after the completion of active treatment.

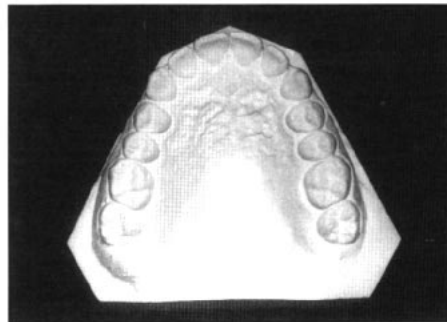


Figure 11D

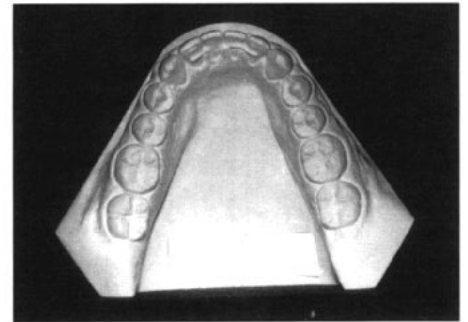


Figure 11E



Figure 12A



Figure 12B

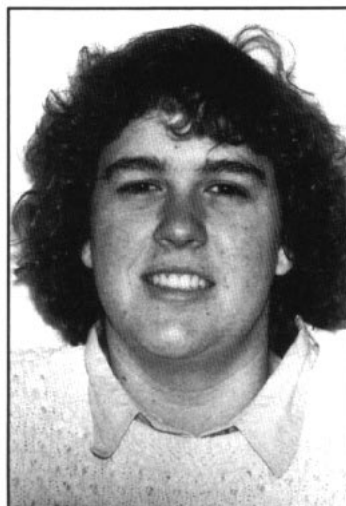


Figure 12C

Figure 12A-C
Note improved facial symmetry at 22 years 9 months.

molars were extracted so bone could fill in the future osteotomy site. Insurance preauthorization for orthognathic surgery was received and appliance placement scheduled.

Fixed appliances were placed at age 17 years 4 months. Following alignment, leveling, and arch coordination the patient was referred to the oral surgeon and an asymmetric mandibular set-back was performed. (The patient delayed the surgery approximately 3 months so it could be done during a vacation time.) Healing was uneventful.

The patient wore anterior cross-elastics for 1 month during orthodontic finishing and appliances were removed at age 19 years 2 months. A mandibular anterior bonded 2-2 and maxillary "invisible" splint were used as retainers.

Results

The combined orthodontic-orthognathic surgical treatment approach allowed this patient to have an ideal Class I dental occlusion without loss of dental units, while restoring facial symmetry to acceptable esthetic and functional levels. In this case, the preexisting TMJ disorder was not appreciably affected by the therapy. In fact the patient had a reduction of symptoms following the initiation of treatment. Other than an instance of muscle discomfort for two months following appliance removal (probably associated with extended oral opening during root canal therapy), the patient has been asymptomatic, with normal interincisal opening. The patient had a session of biofeedback

with a physical therapist and the facial muscle discomfort did not return.

Retention

The removable maxillary retainer was discontinued at age 21 years 1 month, approximately 22 months following appliance removal. The bonded 2-2 mandibular retainer remains in place.

Final evaluation

Follow-up records were taken at age 22 years 9 months. When compared with immediate post-treatment records, a marked degree of stability is evident, in spite of the maturational changes that have occurred with time. This patient, with skeletal mandibular asymmetry, TMJ disorders, and dental malocclusion, was successfully treated by the combination of comprehensive orthodontic care, mandibular surgery, and a brief session of physical therapy.

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