Case Report JB

Treatment of severe temporomandibular dysfunction with a combined orthodontic/surgical approach

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This 27 year 7 month old Caucasian female presented with a class II malocclusion characterized by an open bite from first molar to first molar and slight crowding. She had severe dysfunction of both temporomandibular joints with bilateral clicking, muscle soreness, limited opening and debilitating headaches. The splint she wore to relieve the joint dysfunction had been in place constantly for 7 years. Removal of the splint caused the onset of headaches within 30 minutes.

Initial diagnostic records included laminographs of both joints and a pantographic mounting of the study models, in addition to the standard orthodontic records. Significant anterior "beaking" of the left condyle was noted on the original laminograph. The dentition was crowded and there was a Bolton discrepancy of 1.3mm excess in the mandibular six anterior teeth.

Treatment Objectives

1). Obtain a symmetrical Class I occlusion for optimum function of both the dentition and the temporomandibular joints to promote long-term dental and joint health.

2). Maintain facial esthetics.

3). Close the open bite without extruding the anterior teeth.

4). Establish canine rise and anterior guidance during function.

Treatment Plan

Because of the severe skeletal discrepancy when the patient was in centric relation, a combined orthodontic/surgical approach was selected. The presurgical orthodontic treatment consisted of aligning the teeth to each individual arch with the surgical correction in mind. A one-piece LeFort I impaction of the maxilla would then align the maxilla to the mandible with the majority of the intrusion taking place in the molar region. Canine rise and anterior guidance would be achieved by eliminating the Bolton discrepancy through the interproximal stripping of mandibular incisors and canines.

Treatment Progress

Alignment of the teeth was obtained by placing an .018 X .025 single bracket edgewise appliance with rotation levers (Lang). A Goshgarian palatal bar was used for maxillary first molar control. The wire

Figure 1A-B Pretreatment facial photographs at 27 years 7 months.

Figure 1A

Figure 1B

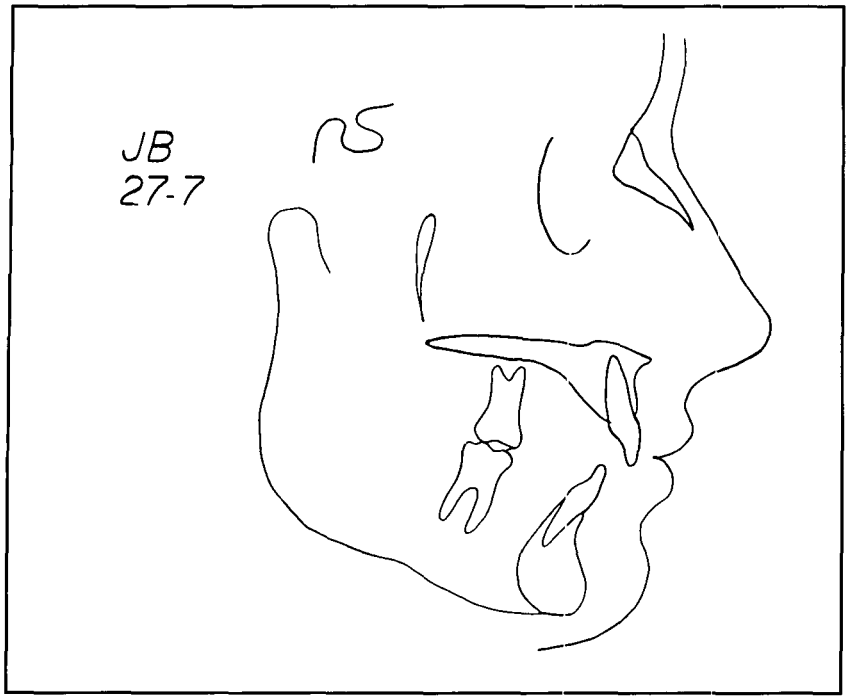

Figure 2

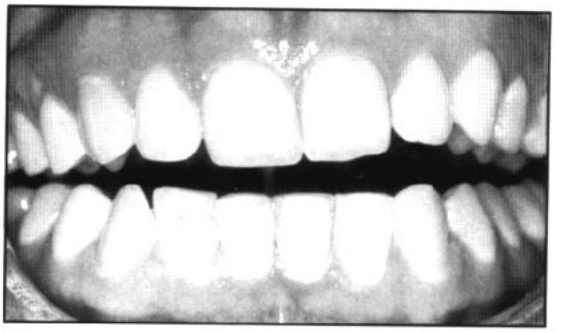

Figure 3

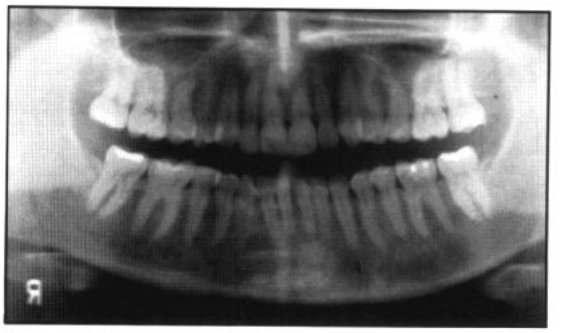

Figure 4

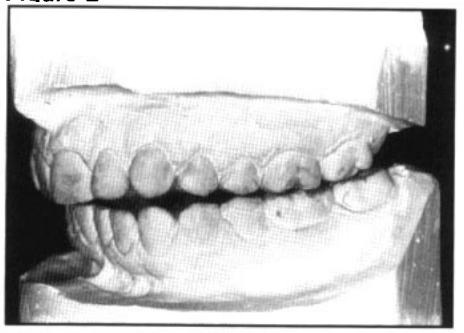

Figure 5

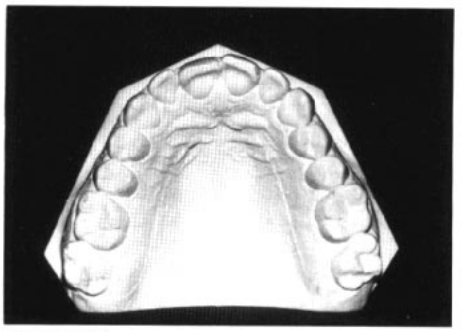

Figure 6A

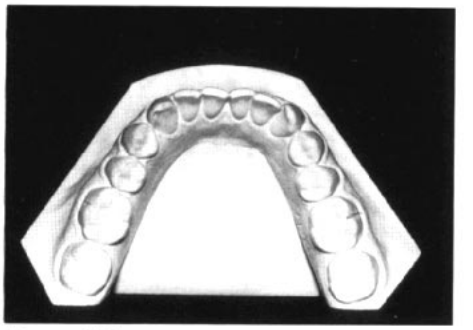

Figure 6B

Figure 2
Pretreatment cephalometric tracing.

Figure 3
Following splint wear the patient had a significant open bite in centric relation (CR). Note the asymmetry as well.

Figure 4
Pretreatment panoramic radiograph.

Figure 5
A pantographic mounting of study casts was useful in developing a plan of treatment.

Figure 6A-B
Pretreatment study casts show fairly good alignment with slight arch length discrepancy.

Figure 7A-C
Laminographs of the left joint in closed (A), rest (B), and open (C) positions. Note the anterior "beaking" of the condyle prior to treatment.

Figure 8A-C
Laminographs of the right joint in closed (A), rest (B), and open (C) positions.

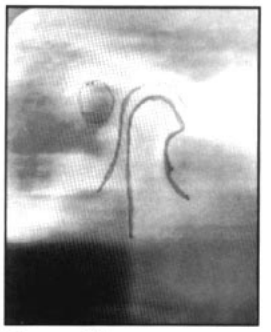

Figure 7A

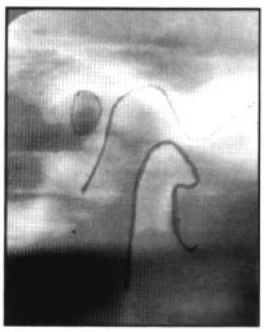

Figure 7B

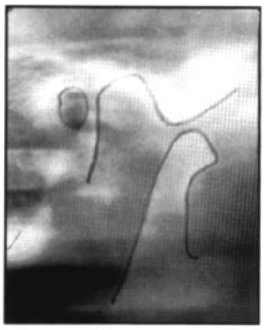

Figure 7C

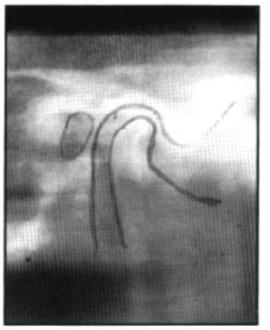

Figure 8A

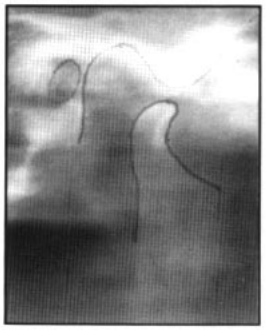

Figure 8B

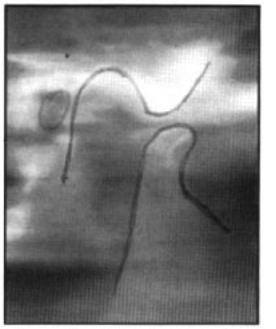

Figure 8C

Figure 9A

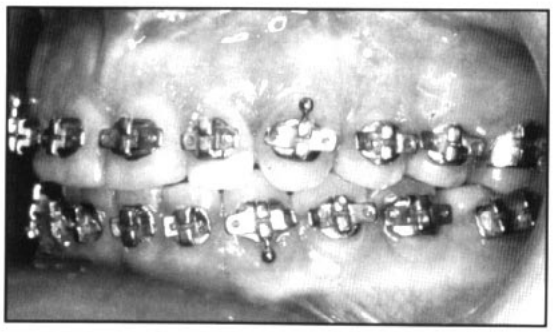

Figure 9B

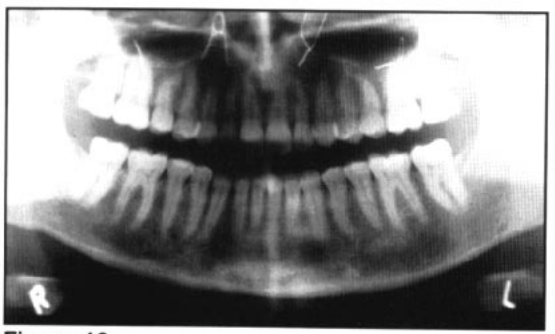

Figure 10

sequence was: 1) .0175 wildcat twist, three-strand, 2) .016 round, stainless, 3) .016 X .022 rectangular, stainless.

The 1.3mm Bolton discrepancy was eliminated at the time the mandibular brackets were placed. The maxillary incisors were torqued lingually, and the mandibular incisors were proclined. The patient was ready for surgery 5 months after the initiation of treatment.

A LeFort I maxillary impaction was performed by Dr. Henry Kawamoto. Four months after surgery the braces were removed and a tooth positioner was placed, allowing the patient to return home to Colorado. Impressions for retainers were taken 4 months later, and maxillary and mandibular removable retainers were placed. Six months later stethoscopic examination revealed continuance of a slight click in the left joint. No pain was present. A maxillary bite splint was made to be worn at night as a retainer, which subsequently eliminated the click.

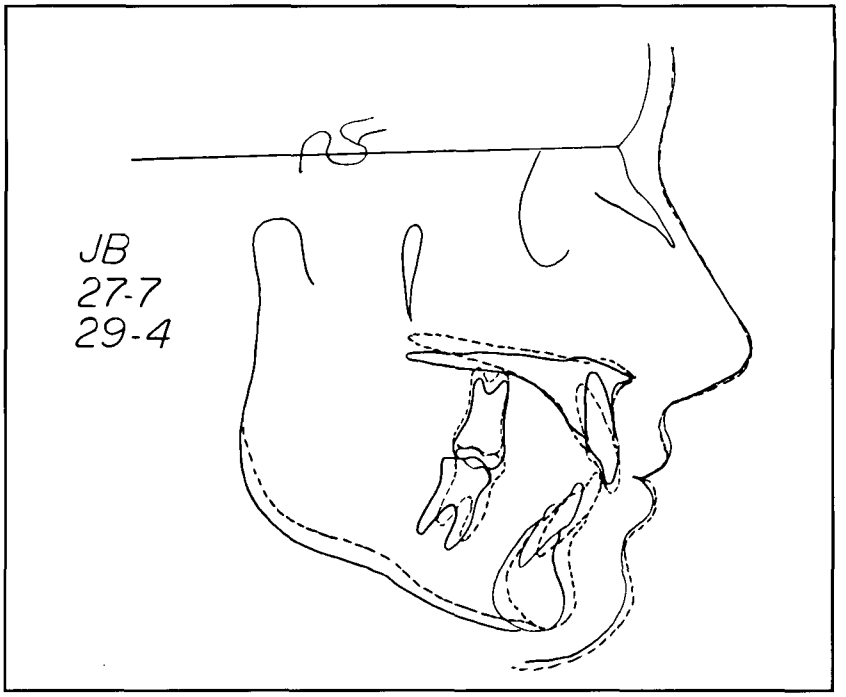

Figure 10

Figure 12A

Figure 12B

Figure 9A-B
Four months after surgery the patient was nearly ready for the removal of fixed appliances.

Figure 10
Posttreatment panoramic radiograph.

Figure 11
Superimposed cephalometric tracings at 27 years 7 months and 29 years 4 months. Note the posterior impaction of the maxilla with autorotation of the mandible.

Figure 12A-B
Posttreatment facial photographs at 29 years 4 months.

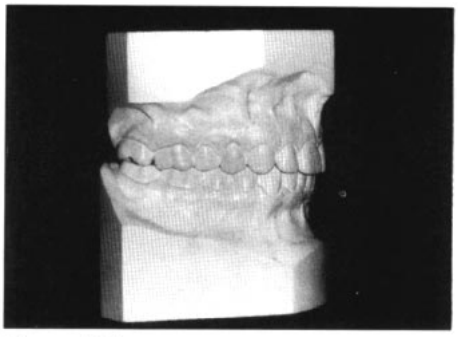

Figure 13A

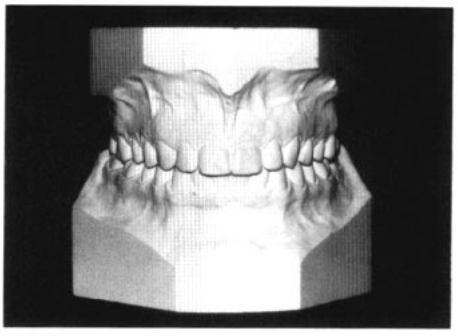

Figure 13B

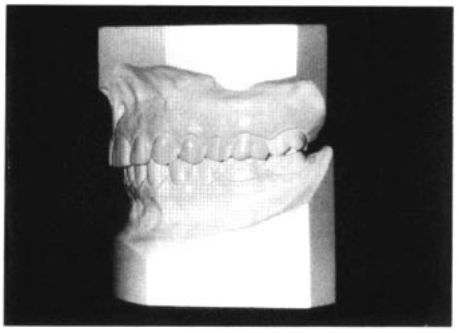

Figure 13C

Figure 13A-E
Posttreatment study casts in centric relation after 4 months of positioner wear.

Figure 14A-C
Posttreatment laminographs of the left joint in closed (A), rest (B) and open (C) positions.

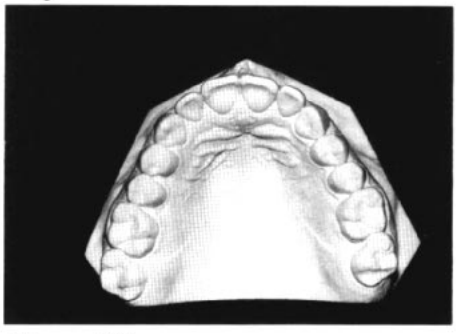

Figure 13D

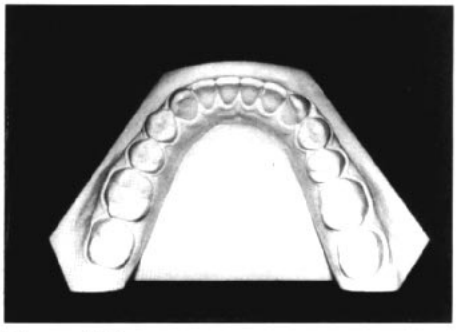

Figure 13E

Figure 14A

Figure 14B

Figure 14C

Figure 15A

Figure 15B

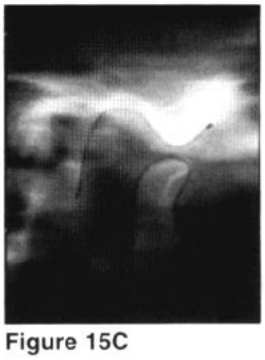

Figure 15C

Figure 15A-C
Posttreatment laminographs of the right joint in closed (A), rest (B), and open (C) positions.

Results

Final facial photographs show a pleasing profile and smile with facial symmetry. Facial esthetics were maintained, and the open bite was closed to establish canine rise and anterior guidance. The patient has remained free of pain and asymmptomatic.

Three years after retention laminographs of the left temporomandibular joint show remodeling of the condyle, with a lessening of the anterior "beaking". The occlusion and surgical correction have remained stable. The patient continues to enjoy painfree function, with no joint noise detected with the use of a stethoscope in all mandibular movements.

Final Evaluation

Much has been written about whether occlusion has any effect upon temporomandibular joint dysfunction (TMD). There are varying opinions regarding the contribution of occlusion (malocclusion) to the development of mandibular dysfunction, and whether occlusal alterations (restorative, orthodontic, surgical, or a combination of any or all) will have any therapeutic value. This case report shows one case where significant improvement in severe temporomandibular joint dysfunction was achieved by establishing more normal form and function.

Acknowledgment

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