Case report
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Case Report n° 3

Patient	
Age:	11.8
Diagnosis	Angle cl.II div.2
ANB	7
OJ	2
OB	10

Case History

The patient is an eleven-year old boy, in good general health.
Due to a fear of dentists and dental treatment, he had seven deciduous teeth extracted under general anaesthesia at the age of seven.
His dental history is non-contributory and free of any events that could have affected the development of his permanent teeth.
There are no bad habits present.
According to his mother, his cousins have a similar malocclusion.

Current Status

He is of average build and average to small, when compared to boys in his age group.
His face is round, with no asymmetry. The profile is convex, the chin is average and the nose seems to be small.
The face height appears normal and so does the jaw inclination. The jaw and the lip muscles are somewhat hypertonic. Both upper and lower lips seem to be thick but normal in length.
When swallowing, the teeth are in contact with no tongue thrust and no mentalis contraction. He is a nose breather.
The path of closure from rest to habitual occlusion is normal, with no premature tooth guidance or mandibular displacement.

The oral hygiene appears adequate, and the caries activity is low.
The soft tissue shows normal texture and colour of the gingiva and mucosa.
Labial frenum, tongue size and lingual frenum are also normal.

Intraoral Findings

The intraoral radiographs show mixed dentition with restorations on 54,55 and 65.
The tooth bud for 25 is positioned horizontally.
It is difficult to find any signs indicating that his third molars are developing and judging by his age, it is very unlikely that he will develop them.

Model Analysis

Lateral View

The actual molar relationship is a bilateral Class I.
Since the lower first molars are mesialized about 3-4 mm, the true molar relationship is Class II.
The canines on both sides are in a Class II relationship.
The overjet is 2 mm. With regards to the vertical relations, the permanent mandibular and maxillary incisors are over-erupted.
The overbite is 10 mm and the lower incisors are impinging the palatal gingiva.
The Curve of Spee is moderate and the lower incisors are retroclined.

Anterior View

The dental midlines are coincident with the facial midline.
12 is mesially tipped and 22 is distally tipped . 55, 14, 24 and 65 are in cross bite.

Occlusal View

The following teeth are present:

6e4c21	12c4d6
6 4321	1234 6

The alveolar process breadth is normal.

The upper arch form is U-shaped and the lower is more or less parabolic.
The mandibular inter-canine distance is 30 mm and the intermolar distance is 52 mm.
12, 22 and 41 are rotated.

Space Analysis

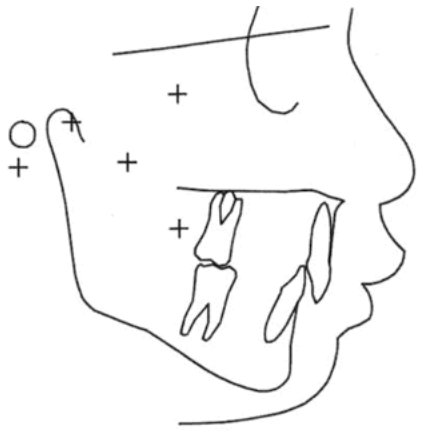
Space analysis reveals 4.5 mm of upper crowding and 12.5 mm of lower crowding.

Bolton Analysis

The value of the overall ratio is within the normal range, but the value of the anterior ratio shows 2 mm difference with the correct width of the lower anterior teeth.

Cephalometric Analysis

Cephalometric Analysis	Mean	Value
SNA	**82**	84.5
SNB	**80**	76
ANB	**2**	8.5
SNPg	**81**	76
NSBa	**130**	137
ML-NSL-1	**32**	33
NL-NSL	**8.5**	12
ML-NL	**23.5**	21
Gn-tgo-Ar	**126**	127
N-Sp' (mm)	**-**	48
Sp'-Gn(mm)	**-**	54
N-Sp'/Sp'-Gn x100%	**79**	89
Interincisiv	**131**	159
+1-NA	**22**	-7
T-NB	**25**	19.4
+1-NA	**4**	-6
T-NB	**4**	1
Pg-NB mm	**-**	0



The SNA angle of 79 shows that the maxilla is in an orthognatic position, but 72° for the SNB puts the mandible in a retrognathic position.
The value of ANB angle indicates distal basal sagittal relation. SNPg, with 72°, is in accordance with the value of SNB.
Both the mandibular and the nasal plane are posteriorly inclined (37°) and the inclination of the maxilla is 14.5 degrees.
However, the intermaxillary angle is within normal limits at 22.5°.

N-angle	**58**	68.5
UL-EL (mm)	**2**	6
LL-EL (mm)	**0**	4
H-angle	**8**	24

The mandibular angle (127°) reveals a posterior growth rotation pattern.
The face ratio gives a contradictory value, suggesting an anterior growth rotation at 96.5°.
There is extreme retrusion of the upper incisors wich are distal to the NA line 5 mm.
The lower incisors are also retroclined, but still mesial to the NB line 2.5 mm. The value of the interincisal angle is 135°.
The Pg point is lying on the NB line. Despite the retrusion of the incisors, the lips are in a mesial position to the EL: UL-EL=-5.5 mm and LL-EL=-3.5 mm.
The H-angle is equals 24°.

Growth Prognosis

He is in MP3 stage and the growth appears to have a posterior pattern.
This is unfavorable for the treatment planning, as he has a distal basal sagittal relation.

Steiner Analysis

It is difficult to make a definite prognosis for the value of ANB after treatment.
Despite the posterior growth rotation, we might expect a reduction of approximately 3°: from 7° to 4°.
That will be due to the positive torque in upper arch, and maybe to some mesial movement of the mandible after its "unlocking" from the distal position.
Pg will, most probably be unchanged: approximately 0 mm.
These two anticipated values bring us to the following position of the incisors:
Following the Steiner analysis it can be seen that there is a 5 mm protrusion of the upper incisors and an unchanged position of the lower ones.
In order to reach interincisal contact, protrusion of the lower incisors is also necessary.
In this case the results obtained from the Steiner Analysis are not very meaningful for our treatment planning.
The prognosis for the N-angle and H-angle are: 6.23 mm and 11.9° respectively.
The anticipated value for the N-angle shows the need for the protrusion of the lower incisors.

Diagnosis

1. Round face, convex profile
2. Distal basal sagittal relation
3. Angle Class II division 2
4. More or less normal vertical relation
5. Overjet of 2 mm and overbite of 10 mm
6. Space deficiency in UA of -4.5 mm and -12.5 mm in the LA
7. Retruded 11 and 21 and buccally tipped 12 and 22
8. Possible agenesis of 18, 28, 38, and 48

Etiology

As the mother informed that there are cousins who have the same malocclusion, then it is safe to say that the etiology is likely hereditary.

Treatment needs

The treatment need is prophylactic, functional, and esthetic.
The very deep bite and incisors that impinge palatal gingiva can cause periodontal problems and impair the normal functions.
By resolving these problems, the patient will also benefit esthetically.

Extraction/Non extraction

There is 12.5 mm of crowding in the lower arch.
To correct the curve of Spee we need 2 mm. Therefore, 14.5 mm of space is required.
Even with molar distalization, incisor protrusion and interproximal reduction, it will be difficult to provide enough space for the second premolars.
There is 4.5 mm of crowding in the upper arch. Protrusion of the incisors will provide the space needed. Therefore extractions are not necessary in order to gain more space.
However, there is great transverse discrepancy between the two jaws (crossbite) and extracting in the lower arch will necessarily be followed by extractions in the maxilla.
In this stage of treatment the extractions will be postponed, but it is very likely that this is going to be a four premolar extraction case.
As to the teeth that are going to be extracted, due to the deep bite, it is better to extract as mesial as possible, so the choice will be: 14, 24, 34 and 44.
The only potential problem is the position of the toothbud for 25 which is horizontally placed and if the prognosis for its eruption is poor, then the extraction choice must be reevaluated.

Tooth movement

In the initial stages of treatment the upper incisors are proclined, thus releasing the

mandible to grow freely.
Upper and lower incisors are intruded, while the posterior segments are extruded in order to decrease the overbite.
Anchorage requirements are not critical at this stage.
Reciprocal intraoral anchorage will be used in the expansion phase and later if there are any extractions, then intraoral class II elastics will be used.

It will be necessary to reevaluate the case after the initial treatment and decide about extractions.

Treatment Objectives

1. Achieve Class I molar and canine relationship
2. Reduce the overbite
3. Eliminate the cross bite
4. Procline the upper incisors
5. Align and harmonize the arches

Treatment Procedures

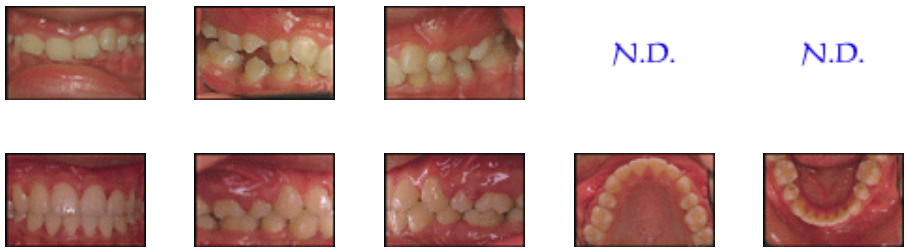
OCT.90	Dental and medical history, clinical examination, intra- and extra-oral photographs, impressions for study models, and radiographs (cephalogram, hand-wrist, panorex) were taken.
DEC.90	Bonded all permanent teeth .016
FEB.91	Bonded lower arch.
MAR. 91	Levelled upper arch. .018 Australian wire
MAY. 91	.018 Australian wire with loops for frontal expansion and stops for the molars. .016 Australian wire
AUG. 91	Referred for extraction of 34 and 44.Utility arch inserted in the LA.
OCT.91	25 has an oblique eruption path and the crown is most probably buccally and the root palatally.
NOV.91	Referred for extraction of 55 and 65 and waiting for eruption of 15 and 25. .018 Australian with stop for the molars.
MAR.92	Bonded 25,45 and included in the arch with nitinol .016x.022
MAY.92	Resorption on the mesial part of the root of 24. Referred for extraction of 14, 24.
OCT.92	Bonded upper canines.
DEC.92	Bonded bands on 15, 25 for derotating them. Cemented bands on 26 to help the rotation of 25.
DEC.92	Activated the coil on 25. New power chain on 15.
APR.93	Removed bands on 25, 26. .016 Australian with intrusion step for the central.
SEP.93	Cemented band on 15 and 46. Bonded bracket on 35 and he usually .018 in the upper arch with intrusion steps for the front.

SEP.93	Tubes on 47 and 37 .016 x .022 with elastics.
NOV. 93	.016 x .016 with intrusion step distal to the laterals.
NOV.93	Added sweep in the lower arch.
MAR.94	Upper arch:Increased step an sweep..016 x .022 Nitinol.
MAY.94	Lower arch: .016 x .022 rectangular wire with sweep.
NOV.94	Upper arch:Contraction arch: .016 x .022.
FEB.95	.016 X .016 with intrusion steps distal to the upper lateral
MAR.95	Class III elastics on the right side to mesialize the upper right segment.
APR.95	Class II elastic on the left and class III on the right
MAY.95	New contraction arch: .016 x .022 rectangular arch.
MAY.95	.016 Australian with steps distal to laterals. Continuous Power chain from 16 to 26 to close residual spaces.
JUN.95	Debonded both arch Upper arch: 2-2 retainer and Hawley plate. Lower arch 3-3

Treatment time

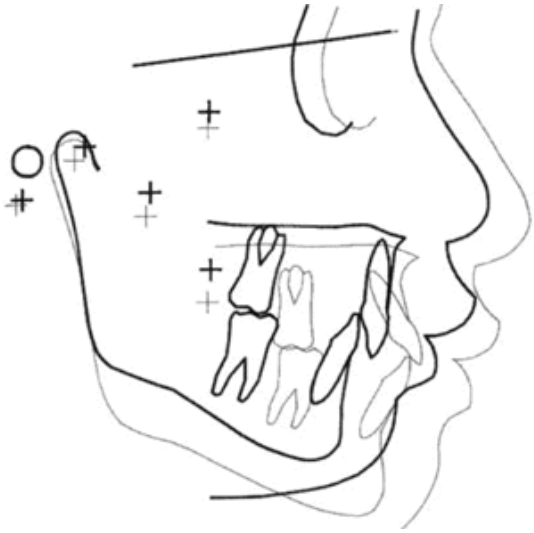
Fixed appliance: 4 years, 5 months.

Evaluation of treatment results



Cephalometric Analysis	Mean	Value 11/90	Value 06/95
SNA	**82**	84.5	84
SNB	**80**	76	80
ANB	**2**	8.5	3
SNPg	**81**	76	81.5
NSBa	**130**	137	137
ML-NSL-1	**32**	33	29

NL-NSL	**8.5**	12	10.5
ML-NL	**23.5**	21	19
Gn-tgo-Ar	**126**	127	125
N-Sp' (mm)	**-**	48	58
Sp'-Gn(mm)	**-**	54	67.5
N-Sp'/Sp'-Gn x100%	**79**	89	86
Interincisiv	**131**	159	120
+1-NA	**22**	-7	27
T-NB	**25**	19.4	29
+1-NA	**4**	-6	5
T-NB	**4**	1	7
Pg-NB mm	**-**	0	1
N-angle	**58**	68.5	64
UL-EL (mm)	**2**	6	1.5
LL-EL (mm)	**0**	4	2
H-angle	**8**	24	20



The main goals of treatment were:

1. Achieve a neutral basal sagittal relation
2. Achieve molar and canine Class I relationships
3. Correct the overjet and the overbite
4. Align and harmonize the arches

The main goals of the treatment objectives were fulfilled.
The space needed was achieved by extraction of 4 premolars.

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