



One jaw or Two jaws? What is current trend among surgeons and orthodontists

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ABSTRACT

Introduction: The aim of this study is to define the trend of the orthodontists and the surgeons in the borderline Class III patients and assess their satisfaction after the surgery.

Materials and Methods: The study population consisted of 31 patients (16 female and 15 male) with the average age of 21 years, whose final occlusion 2 months after the surgery was perfect. The amount of reverse overjet was less than 5 mm in all patients. Surgeons and orthodontists made their treatment plan separately and if there were any differences, the surgeon and orthodontist would discuss it and the patient would be treated by the best treatment plan. The patients' satisfaction at least 5 months after orthognathic surgery was assessed quantitatively by means of a visual analogue scale (VAS) of 10 cm.

Result: Among 31 patients entered in this study, orthodontists suggested two-jaw surgery for 61% of patients while surgeons suggested two-jaw surgery for 45% of patients. In 35% of patients, the orthodontist's treatment plans was different from the surgeon's, but these differences were not significant ($P = 0.23$). This shows that the orthodontists' and surgeons' current trend in borderline Class III patients (reverse overjet less than 5 mm) is two-jaw surgery. At least 5 months after the surgery, the total satisfaction score for appearance was 5 (maximum 7 and minimum 2) and this can indicates that most of the patients see no changes in their appearance or their changes were not significant.

Conclusion: Data analysis of this study indicated that there are no differences between orthodontists and surgeons trend in the treatment plan of the borderline patients, but both of them prefer two- jaw surgery (for 55% of patients) for borderline patients (discrepancy less than 5 mm).

Keywords: Orthognathic Surgery, One Jaw Surgery, Two Jaws Surgery, Borderline Patient

Introduction

It is universally accepted that the aim of surgical-orthodontic treatment is to establish a stable, ideal occlusion with neuromuscular equilibrium and good facial aesthetics. To achieve this goal, certain dentofacial deformities can be treated with orthodontic therapy alone while other cases will require surgical-orthodontic (one jaw or two jaws) treatment. However, there also exist many clinical situations in which this treatment decision is not so obvious. It is clear that surgery in association with orthodontic therapy will result in ideal facial aesthetics and these results can be obtained more rapidly than with non-surgical methods. However, we cannot forget that surgery has

inherent risks, and that the aesthetic motivation of the surgeon may not be shared by each individual patient.

In borderline cases both the surgeon and the orthodontist, and other team members when needed, should agree on the chosen treatment approach.

Many studies have reported norms and ideal perspectives on orthognathic surgery. However, the limits of one jaw or two-jaw surgery are almost unclear. This is due to the many variables involved in establishing these limits such as differences in growth patterns, the abilities of the surgeons, the degree of patient's chief complaint, and cultural and personal perspectives on what is an acceptable result.

While definitive research in this area is not available, clinical insights into the limits of treatment may set the stage

for future research. Therefore, we decided to define the trend of the orthodontists and the surgeons in borderline Class III patients and assess the patients' satisfaction after the surgery.

Material and Methods

Among the 39 patients who were operated for malocclusion Class III, 31 patients (16 female and 15 male) with the average age of 21 (max 29 years and min 17.5 years) and perfect final occlusion 2 months after the surgery were entered in this study (Table 1).

The amount of discrepancy (reverse overjet) was less than 5 mm in all patients. Each patient was referred by an orthodontist after completion of the first phase of orthodontic treatment with the orthodontist suggested treatment plan for the surgery. The surgeon also made a treatment plan and these 2 primary treatment plans were recorded. If there were any differences, the surgeon and orthodontist discussed the best treatment plan and finally the patient was treated by the chosen plan.

After the surgery, the patients were followed each week for the first month, and then each 15 days for the second month. In all patients who entered in the study, final occlusion (not necessarily the profile) after 2 months was perfect.

The patients, all at least 5 months after orthognathic surgery (average 8 months), were asked whether the operation had improved or worsened their general facial

appearance and jaw function, and to indicate the extent on an appropriate visual analogue scale (VAS). Satisfaction with facial appearance (upper lip, nose, teeth, jaws, and total face) and function (speech, chewing) was assessed quantitatively by means of a visual analogue scale (VAS) of 10 cm, where 0 cm indicated totally unsatisfied and 10 cm indicated totally satisfied. A total satisfaction score for appearance was derived by summation of the separate scores divided by the number of items scored.

Quantifying data was reported in average and standard deviation and qualitative data in number and percent. We used chi-square and McNemar tests to compare quantifying data. To compare satisfaction score, t-test was used. Values of $P < 0.05$ were considered statistically significant.

Results

Among 31 patients entered in this study, 14 (48%) were male and 16 (52%) were female. Their mean age was 21 with the minimum of 17.5 and maximum of 29 years of age. Moreover, 13 (42%) of patients had normal vertical facial height and 18 (58%) patients had long vertical face. orthodontists suggested two-jaw surgery for 61% of patients while surgeons suggested two-jaw surgery for 45% of patients.

Table 1. Characteristics of study population and satisfaction after surgery

Pt/	Discrepancy	Vertical	Orthodontist T.P	Surgeon T.P	Sex	Age	Satisfaction after 6 mo. VAS (0-10)	Fallow up mo.	Final T.P
1	>5	L	2	2	M	19	5	7	2
2	>5	L	2	2	F	21	6	8	2
3	>5	N	1	1	F	18	3	6	1
4	>5	N	2	2	M	29	6	8	2
5	>5	L	2	1	M	18	7	7	1
6	>5	L	2	2	F	18	5	7	2
7	>5	N	1	1	F	20	5	8	1
8	>5	L	1	2	M	22	5	9	2
9	>5	N	2	2	M	19	4	8	2
10	>5	N	2	1	F	23	7	7	2
11	>5	L	1	2	M	23	5	8	2
12	>5	L	1	1	M	17.5	6	9	1
13	>5	N	2	1	M	18	7	10	1
14	>5	L	2	2	M	25	5	9	2
15	>5	N	1	1	M	20	4	8	1
16	>5	L	2	2	F	21	7	7	2
17	>5	N	1	1	F	18	5	9	1
18	>5	L	2	2	F	19	5	8	2
19	>5	N	2	1	M	19	6	9	1
20	>5	N	1	2	F	22	4	7	2
21	>5	L	2	1	F	24	5	7	2
22	>5	L	1	1	F	21	2	8	1
23	>5	N	2	1	F	20	4	9	1
24	>5	N	2	2	F	23	5	7	2
25	>5	L	1	1	F	19	4	7	1
26	>5	L	2	2	M	24	4	8	2
27	>5	L	2	1	M	22	6	9	2
28	>5	N	1	1	M	26	4	6	1
29	>5	L	1	1	F	18	3	5	1
30	>5	L	2	2	M	21	4	8	2
31	>5	L	2	1	F	19	6	8	1

Pt: Patient; T.P: Treatment plan; F: Female; M: Male; N: Normal facial height; L: Long face

In 35% of patients, the orthodontist's treatment plans was different from that of the surgeons'. In 73% of patients, orthodontists suggested two-jaw surgery, and suggested one jaw surgery for the rest of them. Although this differences were not significant ($P = 0.23$). Finally 55% of patients were operated by the two-jaw surgery treatment plan. This shows that orthodontists' and surgeons' current trend in borderline Class III patients (reverse overjet less than 5 mm) is two-jaw surgery.

At least 5 months (with the average of 7.7 months) after surgery, all patients were asked whether the operation had improved or worsened their general appearance and to indicate the extent on an appropriate visual analogue scale (VAS).

The total satisfaction score for appearance (at least 5 months after surgery) was 5 (maximum 7 and minimum 2) and this can indicate that most patients believe that there are no changes in their appearance or their changes are not significant.

None of the variables, including sex, age, facial form (long, short, or normal), and kind of the surgery (one or two-jaw surgery), had effect on the patients satisfaction score. Only patients whose treatment plan was different between surgeons and orthodontists had higher satisfaction scores, and these differences were significant ($P = 0.02$) (Table 2).

Table 2. Data analysis

	satisfaction score Mean \pm SD	P-value
Sex		
Female (n = 16)	4.75 \pm 1.39)	0.33
Male (n = 15)	5.2 \pm 1.08)	
Age		
\leq 20 years	4.94 \pm 1.24)	0.89
\geq 20 years	5 \pm 1.31)	
Facial form		
Normal (n = 13)	4.92 \pm 1.26)	0.87
Long (n = 18)	5 \pm 1.28)	
Treatment plan		
Same (n = 20)	4.6 \pm 1.19)	0.02
Different (n = 11)	5.64 \pm 1.12)	
Surgery		
One jaw (n = 14)	5.18 \pm 0.95)	0.31
Two jaws (n = 17)	4.71 \pm 1.54)	

Discussion

This study indicated that the differences in treatment plan between surgeons and orthodontists are not significant and the current trend among orthodontists and surgeons in borderline patients is two-jaw surgery (55%). In review of articles about the treatment plan in borderline patients there was no article about one jaw or two-jaw surgery, or the trend of orthodontists and surgeons.

Studies in borderline patients are whether to do orthodontic alone or orthodontic-surgical treatment.

Although not comparable, in an unpublished survey done by Ahmed et al. in 2004 they show that the number of cases of orthognathic surgeries performed by orthodontists is at a steady or decreased rate independent of experience levels [1].

In a study comparing surgery and orthodontics in

borderline Class II malocclusion adults, Cassidy et al. concluded that orthodontics would be the better choice for the borderline adult Class II patient, whereas surgery would be appropriate for the more severely affected patient [2].

Berger et al. also compare the treatment outcomes and stability of patients with Class II malocclusion treated with either functional appliances or surgical mandibular advancement and suggested that early correction of Class II dentoskeletal malocclusions with functional appliances yields favorable results without the possible deleterious effects of surgery [3]. However, in another study, the authors report the same satisfaction in both groups of patients treated orthodontically or surgically although the orthodontics-only (camouflage) patients reported fewer functional or temporomandibular joint problems than did the surgery patients [4].

On the other hand, there are many studies that indicate patients often improve not only physically, but also psychologically after orthognathic surgery [5-14].

Tucker also mentioned that surgical correction of Class II malocclusions, when associated with mandibular deficiency, often has improved results with combined orthodontic and surgical correction compared with orthodontic treatment alone [15]. However, Rabie et al. concluded that both treatment modalities, including orthodontic camouflage and orthognathic surgery, can achieve satisfactory improvements for patients [16].

In the present study, the satisfaction score shows that patients were not very satisfied by the surgery or the changes were not significant enough to gain their satisfaction. This may be due to short term follow up (mean 7.7 months) after the surgery.

Nagamine et al., in a study, assessed the satisfaction of patients following surgical-orthodontic correction of skeletal Class III malocclusions by questionnaire [17]. They found that 78% of the patients were satisfied with the results in regard to their chief problems and 75% had improved masticatory function.

In our study, satisfaction score of patients who underwent two-jaw surgery was not high. However, Posnick and Wallace in a well designed study assessed satisfaction of patients after complex orthognathic surgery and clarified that complex bimaxillary orthognathic surgery, including simultaneous intranasal and other procedures, can be carried out with a high level of patient satisfaction [18].

Conclusion

Data analysis of this study indicated that there are no differences between orthodontists' and surgeons' trend in the treatment plan of the borderline patients and both of them prefer two-jaw surgery (for 55% of patients) for borderline patients (discrepancy less than 5 mm).

Conflict of Interest: 'None declared'.

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