

# Early orthognathic surgery in response to bullying due to malocclusion

## Abstract

Unfavourable dental and facial features can have a psychological impact on patients. Orthodontic treatment can have a positive impact on the psychosocial well-being of patients who are bullied about dentofacial features. The use of orthognathic surgery in growing patients to correct dentofacial deformity is a controversial topic. This case report describes the treatment performed for a 13-year-old girl who presented complaining of a “different bite and prominent chin”, which was attracting insults at school. Insults regarding her teeth and jaw caused symptoms such as anxiety and stomach pains prior to school in the morning. As a result of the negative psychological effects of the serious bullying, it was decided to proceed with early orthognathic surgery for psychological reasons. As orthognathic surgery is usually timed in the late teens or early twenties when growth is near completion, the risks of further growth and relapse were discussed at length with the patient and her parents, especially when informed consent was being obtained. Treatment included orthodontic alignment of the arches, early orthognathic bimaxillary surgery and post-surgical orthodontics to detail the occlusion.

There was a dramatic improvement in the patient’s self-esteem, with return to school and extra school activities only weeks after the surgery. This case demonstrates that early intervention may be appropriate for some orthognathic patients in exceptional circumstances. The patient and her parents were very happy with the outcome but post-treatment growth was unfavourable as expected.

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FIGURE 1: Pretreatment extra-oral and intra-oral pictures.

1A: Extra-oral portrait.



1B: Right lateral view.



1C: Left lateral view.



1D: Frontal intra-oral.



1E: Right intra-oral.



1F: Left intra-oral.



1G: Maxillary occlusal.



1H: Mandibular occlusal.



1I: Pre-treatment cephalogram.

## Introduction

Teasing and bullying are endemic at school and can affect nearly one in four schoolchildren in Ireland, with possible devastating and long-lasting consequences.<sup>1</sup> Health Behaviour in School Children (HBSC) Ireland 2010 found that 24.3% of schoolchildren in Ireland report having been bullied.<sup>2</sup> Bullying may be explained as repeated physical, verbal or psychological aggression directed by an individual or group against others.<sup>2,3</sup> Victimisation and bullying can have serious psychological consequences leading to feelings of depression, loneliness, anxiety and low self-esteem.<sup>4</sup> Long-term exposure to bullying can also lead to suicide in extreme cases.<sup>2,5</sup> The increased popularity of social media networks has given rise to new ways of bullying using technology, such as cyberbullying.<sup>2,6</sup>

In a study of 11- to 13-year-olds questioned regarding teasing, 75% cited teasing or bullying about their appearance as causing considerable distress.<sup>7</sup> The social and psychosocial influence of dental and facial appearance have been reported to have an important influence on people's perception of an individual's friendliness, social class, popularity and intelligence.<sup>4,8</sup> Oral health-related quality of life (OHRQoL) is defined as the absence of negative effects of oral conditions on social life and a positive sense of dentofacial self-confidence.<sup>9-10</sup> It has been shown that a malocclusion can have an impact on an individual's OHRQoL.<sup>11-13</sup> In a study conducted by Al-Bitar *et al.* (2013), teeth featured as the frequent target for bullying.<sup>14</sup> Comments about teeth appeared to be more hurtful than those about other features.<sup>4,15</sup>



FIGURE 2: Lip bumper advancing lower incisors with direct elastic traction.



FIGURE 3: Rectangular archwires were placed.



FIGURE 4: Lateral view four days post surgery.

Studies conducted by Al-Omari *et al.* (2014) and Seehra *et al.* (2011) both concluded that a significant relationship exists between bullying due to dentofacial features impacting poorly on self-esteem and OHRQoL.<sup>9,11</sup> Patients with a high aesthetic component (AC) assessed by the Index of Orthodontic Treatment Need (IOTN) may be more prone to being bullied.<sup>11</sup> A further problem with facial and dental deformity is that in social interaction it is invariably impossible to hide or disguise it, because in normal interaction the eyes attend the face.<sup>4,16</sup>

The use of orthognathic surgery to correct dentofacial problems in growing patients is controversial,<sup>17</sup> and is only undertaken in exceptional circumstances. The possibility of undertaking early surgery in Class III patients with severe antero-posterior (AP) dento-facial discrepancy should be evaluated with caution, as normally orthognathic surgery is timed at the end of the teens or in the early twenties when growth is near completion. Comprehensive discussion and informed consent are essential, explaining the possibilities of relapse due to further growth. Since true Class III growth may continue during late adolescence and the early adult years, there must be a mitigating circumstance, such as a patient's significant psychological need or desire, to justify early treatment.<sup>17</sup> A psychological assessment and report on the patient is helpful in this regard prior to deciding if early surgery is appropriate.

### Case report

A 13-year-old girl presented complaining of a "different bite and prominent chin", which was attracting insults at school. The distress was such that prior to school in the morning this young girl suffered stomach pain and other anxiety symptoms.

The patient had a Class III malocclusion on a severe skeletal III dental base relationship with an ANB of -7 degrees. The maxilla was hypoplastic and narrow with palatally displaced canines. There was moderate proclination of the maxillary incisors and a retained left deciduous canine. The mandible was prognathic and well aligned with severe retroclination of the lower incisors and a submerged second deciduous molar. In occlusion, the overbite was reduced and a reverse overjet of 3mm was present, in combination with a bilateral buccal crossbite (Figures 1A-1I).

The psychological effects of bullying, combined with a poor prognosis for any orthopaedic Class III correction, prompted a decision to treat the skeletal discrepancy with early orthognathic surgery. Strong emphasis was placed on the risks of relapse when informed consent was obtained.

### Treatment plan

- Fixed appliance of the arches and with decompensation of the incisors.
- Early orthognathic bimaxillary surgery to correct the antero-posterior and transverse discrepancy.
- Post-surgical orthodontics to detail the occlusion.
- Retention with removable retainers: one year full-time and nightly for three years.
- Yearly review and follow-up to monitor retention, growth and stability of result.

### Treatment

Orthodontic treatment was commenced at 13 years and 10 months when upper and lower fixed appliances (0.022" x 0.028" bracket system plus transpalatal arch) were placed. The lower incisor brackets were inverted to help decompensation. Light nickel titanium wires were used to align the arches, especially the palatally displaced upper canines. During the alignment and decompensation phase of the treatment, difficulty was encountered in advancing the severely retroclined lower incisors and a lip bumper was used with elastic traction for this purpose (Figure 2). Rectangular archwires were inserted (Figure 3). Surgical hooks were later placed on the archwires. Full decompensation of the lower incisors was not achieved as the increase in reverse overjet gave rise to further distress to the patient. Two surgical splints were fabricated to enable the surgeon to place the jaws in the pre-planned positions during surgery. Bimaxillary surgery involving a maxillary advancement of 5mm coupled with a mandibular bilateral sagittal split setback osteotomy of 5mm was undertaken at 15 years and five months. The AP discrepancy was mildly over-corrected to compensate for expected further mandibular growth. The patient made an uneventful recovery from the surgery (Figure 4). Post-surgical orthodontic finishing and detailing continued for a further six months



FIGURE 5: Post-treatment cephalogram.

and a pre-debond cephalogram was taken (Figure 5). Records were taken at debond and annually thereafter. Despite some expected unfavourable post-surgical mandibular growth (Table 1), normal dento-alveolar compensation helped to maintain a pleasing and satisfactory occlusion (Figures 6A-6I).

**Conclusion**

This case report illustrates the possible benefit of early orthognathic surgery when an adolescent is being bullied because of dentofacial deformity. The justification for performing early orthognathic surgery in patients of this age is to improve their self-esteem and quality of life.<sup>17</sup> This intervention may be more successful in females due to earlier skeletal maturation than in males with less mandibular growth in the post-pubertal period. This may make the post-surgical results more stable.<sup>17</sup> Kiyak *et al.* (1985) stressed the importance of the surgical orthodontic team working closely with patients long after surgery to assure a successful recovery, not only physiologically but emotionally as well.<sup>18</sup> Ryan *et al.* (2012) reported that orthognathic surgery may be seen as a psychological intervention in addition to a physical treatment, as there is evidence that it provides psychological benefits including improved self-esteem, social adjustment and quality of life.<sup>19</sup>

Early orthognathic surgery in growing Class III patients must be undertaken only after careful consideration, appropriate psychological evaluation and

adequate discussion with the patient and parents regarding the added risks of further adverse growth and relapse. As orthodontists, it is important to have compassion and empathy for young patients suffering psychologically due to their dentofacial features and early orthognathic surgery may be helpful in such circumstances.

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**References**

1. O’Neill, B., Dinh, T. Cyberbullying among 9-16 year olds in Ireland. Digital Childhoods Working Paper, 2013: 1-12.
2. Callaghan, M., Clarke, N., Gavin, A., Kelly, C., Molcho, M., Nic Gabhainn, S., *et al.* Bullying behaviour among schoolchildren in Ireland. HSBC Ireland Research Factsheet, 2010: 8, 1-2.
3. Department of Education and Skills. Guidelines on Countering Bullying Behaviour in Primary and Post-Primary Schools, 1993: 1-12.
4. DiBiase, A.T., Sandler, P.J. Malocclusion, orthodontics and bullying. *Dental Update* 2001; 28 (9): 464-466.
5. Meltzer, H., Vostanis, P., Ford, T., Bebbington, P., Dennis, M.S. Victims of bullying in childhood and suicide attempts in adulthood. *European Psychiatry* 2011; 26 (8): 498-503.
6. Wang, J., Nasel, T.R., Iannotto, R.J. Cyber and traditional bullying: differential association with depression. *Journal of Adolescent Health* 2011; 48 (4): 415-417.
7. Lovegrove, E., Rumsey, N. Ignoring it doesn’t make it stop: adolescents, appearance, bullying. *Cleft Palate–Craniofacial Journal* 2005; 42 (1): 33-44.
8. Secord, P.F., Backman, C.W. Malocclusion and psychological factors. *Journal of the American Dental Association* 1959; 59 (5): 931-938.
9. Al-Omari, I.K., Al-Bitar, Z.B., Sonbol, H.N., Al-Ahmad, H.T., Cunningham, S.J. Impact of bullying due to dentofacial features on oral health-related quality of life. *American Journal of Orthodontics and Dentofacial Orthopaedics* 2014; 146 (6): 734-739.
10. Inglehart, M.R., Bagramian, R.A. Oral health-related quality of life: an introduction. *Oral Health-related quality of life*. Chicago: Quintessence Publishing Co, 2001: 1-6.
11. Seehra, J., Fleming, P.S., Newton, T., DiBiase, A.T. Bullying in orthodontic patients and its relationship to malocclusion, self-esteem and oral health-related quality of life. *Journal of Orthodontics* 2011; 38 (4): 247-256.
12. O’Brien, C., Benson, P.E., Marshman, Z. Evaluation of a quality of life measure for children with malocclusion. *Journal of Orthodontics* 2007; 34 (3): 185-193.

**Table 1: Summary of cephalometric changes**

Measurement	SNA	SNB	ANB	MMA	LFH%	SN/ MX PL	UP. Inc./ MAX PL	L. Inc. / MAND PL	StA-Tvl	StB-Tvl
Normal (SD)	81°+-3	78°+-3	3°+-2	27°+-3	55%+-2	8°+-3	108°+-6	93°+-6	-1mm+-1	-5.3mm+-1.5
Pre-treatment	83°	90°	-7°	30°	54%	7°	120°	66°	-2mm	+5mm
Pre-surgery	83°	91°	8°	29°	49%	10°	103°	72°	-2mm	+5mm
Post-treatment	80°	77°	3°	28°	54%	16°	110°	80°	0mm	-3mm
Post two years ret	80°	79°	1°	28°	55%	16°	110°	77°	-.5mm	-2mm



FIGURE 6: Extra-oral and intra-oral records two years post treatment.

6A: Extra-oral portrait.



6B: Right lateral view.



6C: Left lateral view.



6D: Frontal intra-oral.



6E: Right intra-oral.



6F: Left intra-oral.



6G: Maxillary occlusal.



6H: Mandibular occlusal.



6I: Cephalogram two years post treatment.

13. O'Brien, K., Wright, J.L., Conboy, F., Macfarlane, T., Mandall, N. The child perception questionnaire is valid for malocclusions in the United Kingdom. *American Journal of Orthodontics and Dentofacial Orthopaedics* 2006; 129 (4): 536-540.
14. Al-Bitar, Z.B., Al-Omari, I.L., Sombol, H.N., Al-Ahmed, H.T., Cunningham, S.J. Bullying among Jordanian schoolchildren, its effects on school performance and the contribution of general physical and dentofacial features. *American Journal of Orthodontics and Dentofacial Orthopaedics* 2013; 144 (6): 872-878.
15. Shaw, W.C., Meek, S.C., Jones, D.S. Nicknames, teasing, harassment and the salience of dental features among school children. *British Journal of Orthodontics* 1980; 7 (2): 75-80.
16. McGregor, F.C. Social and psychosocial implications of dentofacial disfigurement. *Angle Orthodontics* 1970; 40 (3): 231-233.
17. Villegas, C., Oberti, G., Jimenez, I., Franchi, L., Baccetti, T. Early orthognathic surgery in growing Class III patients. *Journal of Clinical Orthodontics* 2010; 44 (11): 651-664.
18. Kiyak, H.A., McNeill, R.W., West, R.A. The emotional impact of orthognathic surgery and conventional orthodontics. *American Journal of Orthodontics and Dentofacial Orthopaedics* 1985; 88 (3): 224-234.
19. Ryan, F.S., Barnard, M., Cunningham, S.J. Impact of dentofacial deformity and motivation for treatment: a qualitative study. *American Journal of Orthodontics and Dentofacial Orthopaedics* 2012; 141 (6): 734-742.