

CASE REPORT

ODONTOLOGY

Emilio Nuzzolese,¹ Ph.D. and Nunzio Cirulli,² Ph.D.

Orthodontic Surgery and Professional Liability: The Homozygote Twin Case*

ABSTRACT: A professional liability lawsuit of an orthodontic case is presented through its medico-legal assessment. The patient underwent an orthodontic treatment combined with several maxillo-facial surgical interventions. Several temporomandibular joint complications followed, plus he was unhappy with aesthetic results and modifications to his facial features. He wanted to verify from a medico-legal point of view the treatment received as he believed something was not done *lege artis*. The result of the orthodontic assessment was that there were no indications for such surgical interventions, along with other professional negligence: no psychological support given and no indications as to the aesthetic results postsurgery. It was decided to carry out an orthodontic assessment also on his homozygote twin brother, who was discovered to have the same malocclusion. His medico-legal assessment did not substitute the evidence obtained from the deceased, but gave added weight to the final technical conclusion.

KEYWORDS: forensic science, forensic odontology, professional liability, orthognatic surgery, orthodontic treatment, maxillo-facial surgery

Patients with dental and skeletal malocclusion may need not only several fixed orthodontic appliances but, under certain conditions, also one or more maxillo-facial surgical interventions to reposition one or both jaws. This is the case when facial discrepancies are beyond the corrective range of a traditional orthodontic appliance, and the therapeutic result with this latter may be considered a compromise. Nevertheless, orthognatic surgery of jaws requires a full evaluation of expected/desired versus predictable/obtainable results. As facial somatic features will be modified by the treatment, it is essential to give psychological support to these patients before and after surgery, even when an aesthetic improvement is expected and/or effectively obtained (1–5). In some cases, patients may have unrealistic expectations and should be discouraged from surgery (6). For this reason, a compromise reached without surgery may be more appropriate.

Case Report

Dental Background

In 2001, an adult patient aged 31 referred himself to a private dental practice for an orthodontic consultation. His main concern was the alignment of the anterior inferior teeth (Fig. 1a–d). After an orthodontic evaluation, based on panoramic and lateral X-ray images, study models of jaws, and a cephalometric analysis, the dentists recommended that he must undergo a fixed orthodontic treatment, combined with orthognatic surgery.

The patient agreed to the treatment in 2002, and in 2004 he underwent the first orthognatic procedure (Fig. 2a,b). After the surgery, he awoke with an open bite because of a premature

occlusal contact of the posterior teeth, which was eventually resolved by removing some of the occlusal surface of the posterior molars. While continuing the treatment, he also received a mentoplasty in 2005, and in 2006 his treatment was considered complete. The orthodontist declared in a certificate “... *the treatment can surely be considered, from a technical point of view, concluded.*”

The patient was not happy with the final aesthetic results and started suffering major temporomandibular disorders combined with pain during his masticatory functions. He decided to seek a second opinion and also consulted a psychologist. He became, in fact, self-conscious to the point of wearing a scarf even during summer in order to cover the lower part of his face.

In 2007, he started a gnatologic treatment with an acrylic bite and was scheduled for new (further) orthognatic surgery, which was yet never performed.

Medico-Legal Analysis

In 2008, he consulted Dr. Nuzzolese for a medico-legal consultation. He reported feeling severely depressed in himself and in his private life. He wanted an expert’s witness report on the treatment received to evaluate whether there had been any malpractice, and whether it had been prudent for him to undertake the surgery in the first place. As the case related to the professional responsibilities of an orthodontic practitioner, a supplementary consultation from an orthodontist was requested.

In 2009, the patient committed suicide. When his parents visited Dr. Nuzzolese, they were naturally very distressed and unsure whether to proceed with the medico-legal evaluation started a few months before. It was only at the point when all the documents were about to be given back to the parents that it was discovered that the patient had a homozygous twin, who was identical (7). This represented additional psychological trauma for the patient as he was able to see in his identical twin brother, his own face as it was before the surgery. According to his surviving brother, the

¹Forensic Odontologist, Viale JF Kennedy 77, 70124 Bari, Italy.

²Orthodontist, Via Che Guevara 1, 70124 Bari, Italy.

*Presented at the 62th Annual Meeting of the American Academy of Forensic Sciences, February 22–26, 2010, in Seattle, WA.

Received 29 Sept. 2010; and in revised form 19 May 2011; accepted 12 June 2011.

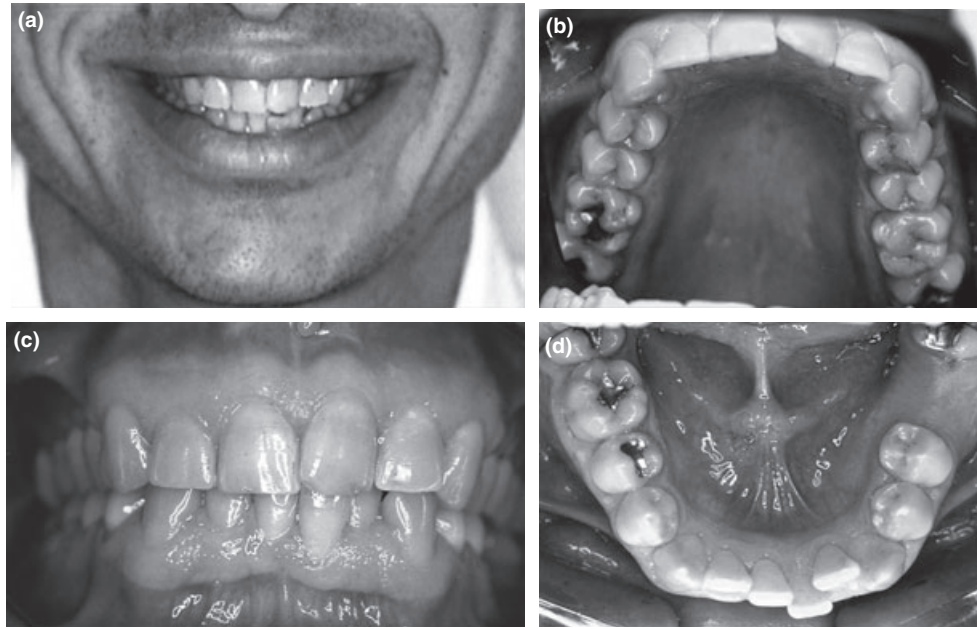


FIG. 1—(a) The patient immediately before starting any treatment. (b) Intraoral view of the upper arch. (c) Intraoral frontal view. (d) Intraoral view of the inferior arch.

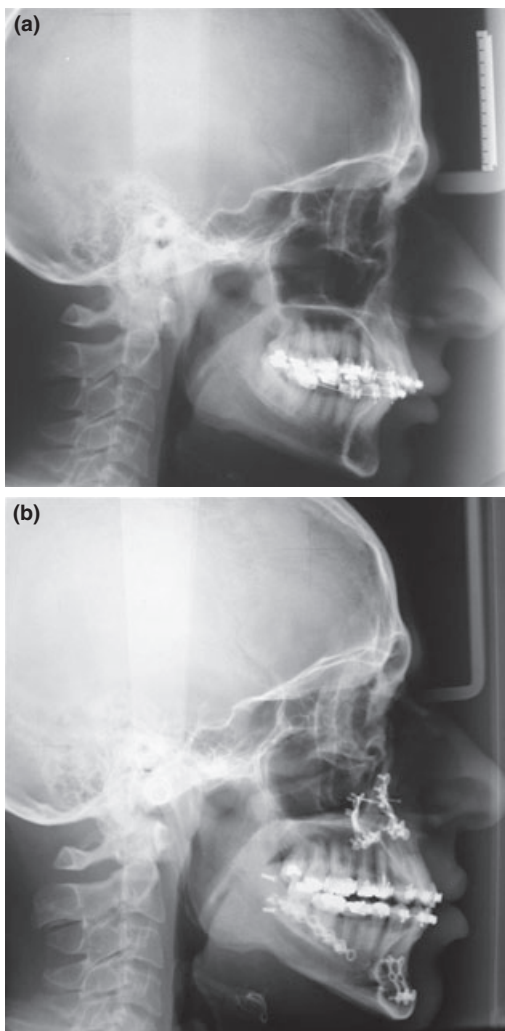


FIG. 2—(a) Lateral X-ray image of the patient with the orthodontic appliance prior to the maxillo-facial surgery. (b) Lateral X-ray image of the patient after surgery (orthognathic surgery and mentoplasty).

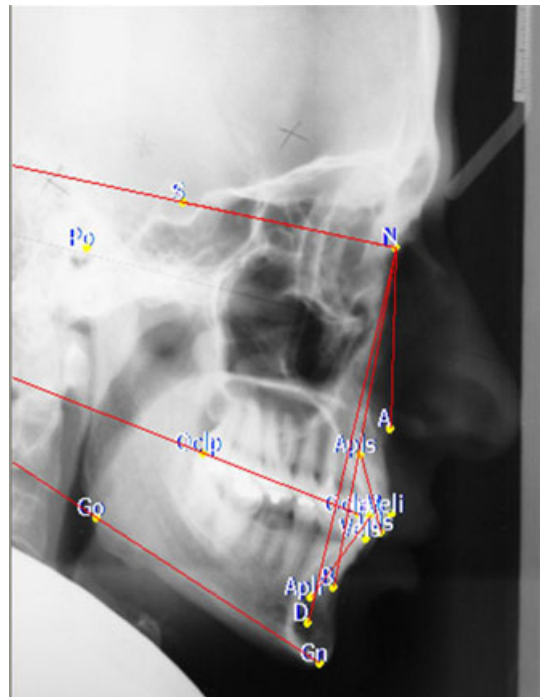


FIG. 3—Lateral X-ray image with erroneous positioning of the head in a post-rotated way.

patient's principal difficulty lay in his inability to accept that his face had become somewhat shorter than before.

The parents decided to proceed with the medico-legal evaluation, and an analysis was also carried out on the surviving brother from an orthodontic perspective.

Orthodontic Study of Twin Brother

The orthodontic analysis based on the pretreatment lateral X-ray images and the cephalometric study revealed an initial mistake in the positioning of the patient's head during the very first lateral

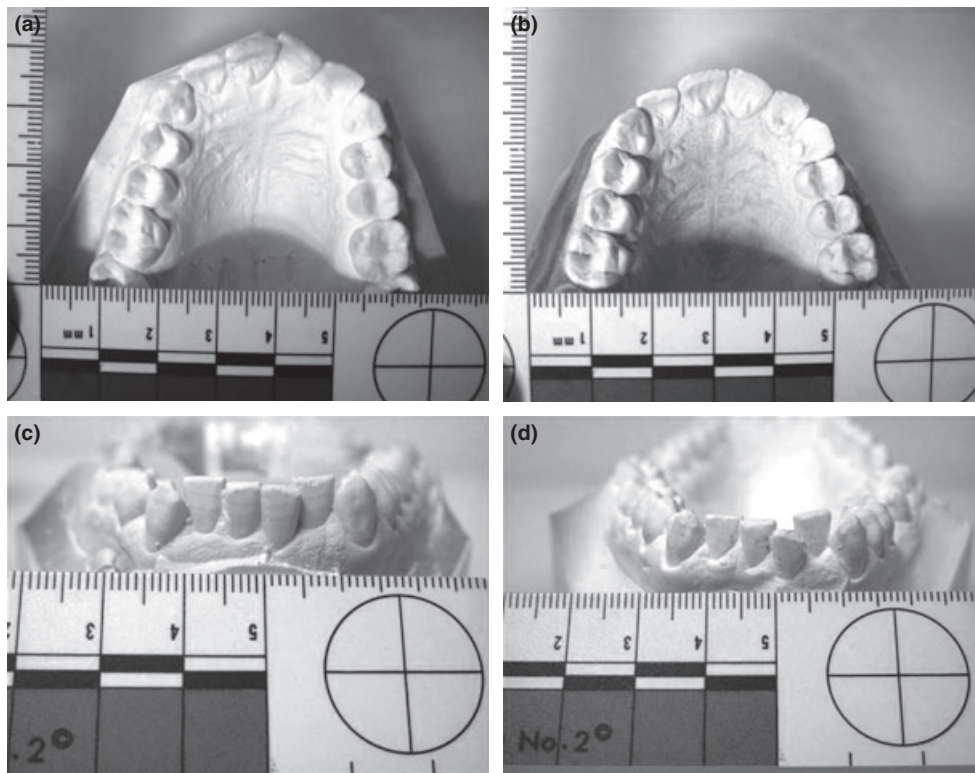


FIG. 4—(a) Upper arch cast of the patient. (b) Upper arch of the monozygotic twin brother. (c) Mandibular arch cast of the patient with the details of the crowded anterior teeth. (d) Mandibular arch cast of monozygotic twin brother with the details of the crowded anterior teeth.

X-ray exposure, that is, in a post-rotated way lowering the face and the chin (Fig. 3). As a consequence of the incorrect position of the head as it appears on the lateral X-ray image, the cephalometric drawings and planes were faulty and lead to an erroneous diagnosis (angle ANB = 8.31) that overrated the malocclusion—from a skeletal point of view rather than just a dental one.

It is likely to have been this evidence on which the surgeon made his decision that orthognatic surgery was indicated, as there was little doubt from the cephalometric evaluation performed by the orthodontist that this was an appropriate case for surgery.

The correct orthodontic diagnosis was a skeletal class I malocclusion, hypodivergent face, with no indications for orthognatic surgery (angle ANB = 1.79). Cephalometric analysis was also performed on the deceased's brother. His orthodontic assessment and clinical observations confirmed that the twins' images were practically superimposable (Fig. 4a-d) also from a dental and morphometric point of view (Fig. 5). Usually, identical twins are not dentally identical (8,9). However, it seems that malocclusions in monozygotic twins have a hereditary nature and small variations (10,11). In this regard, this case showed dental similarities and cephalometric matching that were intentionally used to demonstrate, together with other objective elements belonging to the case already stated, how the patient's face and occlusion would look today had he not undergone any of the orthognatic surgery and any orthodontic treatment at all.

Discussion

Not only did the maxillo-facial surgeon fail to supervise the patient before the surgery (culpa in vigilando), but did not recommend any psychological support, either before or after the surgery. This is always required when facial somatic features would be

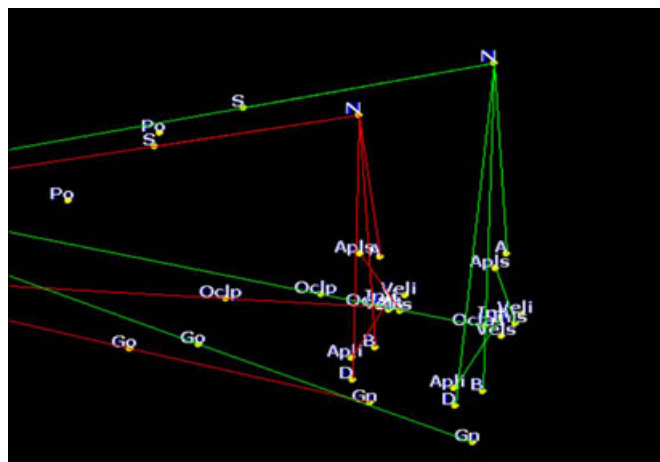


FIG. 5—Comparison of the cephalometric analysis of the patient (left) with his twin brother (right).

modified by the treatment, even when an aesthetic improvement is expected and/or effectively obtained (12,13).

In this specific case, a psychological consultation would have been helpful not only in alerting the surgeon to the fact that the patient was not a good candidate for surgery, but may also have served to dissuade him from performing it—as in the case of his twin brother, who never bothered. The medico-legal assessment of the patient's twin brother did not substitute the evidence obtained from the deceased, but gave added weight to the final technical conclusion that the treatment was performed with no medical indication. In other words, the maxillo-facial surgery was not indicated or justified in this case.

As of today, the lawyers commissioned by the deceased's family have received no reply from either the orthodontist or the maxillo-facial surgeon. I expect this case to be rather protracted, but still deserves to be brought to a completion, not only for medico-legal reasons, but also in respect of the memory of the patient.

I wish to make it clear, however, that we in no way seek to imply that the patient's suicide was a consequence of the dental treatments discussed in this case report.

References

1. Macgregor FC. Facial disfigurement: problems and management of social interaction and implications for mental health. *Aesthetic Plast Surg* 1990;14(4):249–57.
2. Aro H. Risk and protective factors in depression: a developmental perspective. *Acta Psychiatr Scand Suppl* 1994;377:59–64.
3. Lazaridou-Terzoudi T, Kiyak HA, Moore R, Athanasiou AE, Melsen B. Long-term assessment of psychologic outcomes of orthognathic surgery. *J Oral Maxillofac Surg* 2003;61(5):545–52.
4. Motegi E, Hatch JP, Rugh JD, Yamaguchi H. Health-related quality of life and psychosocial function 5 years after orthognathic surgery. *Am J Orthod Dentofacial Orthop* 2003;124(2):138–43.
5. Nardi P, Acocella A, Tedesco A, Rispoli A, Giacomelli E. Psychological aspects in orthognathic surgery. Body image and quality of life in post-surgical assessment. *Minerva Stomatol* 2003;52(4):145–52, 152–5.
6. Cuniberti P, Curtioni G, Degioanni P, Mellana M, Polastri F, Romano S, et al. La dimensione soggettiva nel percorso di cura del paziente sottoposto ad intervento combinato di osteotomia mascellare e mandibolare per il riposizionamento ortodontico. *Psicologia della Salute* 2004;1:143–52. (in Italian)
7. Kabban M, Fearn J, Jovanovski V, Zou L. Tooth size and morphology in twins. *Int J Paediatr Dent* 2001;11(5):333–9.
8. Sognaes RF, Rawson RD, Gratt BM, Nguyen NBT. Computer comparison of bitemark patterns in identical twins. *J Am Dent Assoc* 1982;105:449–51.
9. Kieser JA, Bernal V, Neil Waddell J, Raju S. The uniqueness of the human anterior dentition: a geometric morphometric analysis. *J Forensic Sci* 2007;52(3):671–7.
10. Lundström A. An investigation of 202 pairs of twins regarding fundamental factors in the aetiology of malocclusion. *Dent Rec (London)* 1949;69(10):251–64.
11. Klink-Heckmann U, Dahl T. Pair comparison of the jaw development in monozygotic twins (in German). *Zahn Mund Kieferheilkd Zentralbl* 1977;65(7):762–9.
12. Wackens G. The psychological implications of orthognathic surgery (in French). *Rev Belge Med Dent* 2002;57(1):32–6.
13. Rispoli A, Acocella A, Pavone I, Tedesco A, Giacomelli E, Ortiz L, et al. Psychoemotional assessment changes in patients treated with orthognathic surgery: pre and postsurgery report. *World J Orthod* 2004 Spring;5(1):48–53.

Additional information and reprint requests:

Emilio Nuzzolese, Ph.D.
Forensic Odontologist
Viale J.F. Kennedy 77
70124 Bari Italy
E-mail: emilionu@tin.it