International Poster Journal IPJ of Dentistry and Oral Medicine

Int Poster J Dent Oral Med 2003, Vol 5 No 04, Poster 201

The Helkimo-Index as an instrument of clinical functional analysis in orthognathic surgery

Language: English

Authors:
Dr. med. Dr. med. dent. Peter Maurer, Cornelia Otto, Dr. Alexander W. Eckert, Prof. Dr. Dr. Johannes Schubert
(Martin-Luther-Universität Halle-Wittenberg, Klinik und Poliklinik für Mund-, Kiefer- und Plastische Gesichtschirurgie)
Dr. Jens J. Bock
(Martin-Luther-Universität Halle-Wittenberg, Poliklinik für Kieferorthopädie)

Date/Event/Venue:
03.09.-07.09.2002
European Association of Craniomaxillofacial Surgeon
Münster, Germany

Introduction

Pronounced, skeletally mediated deviations in the maxillofacial region lead to functional disturbance of the stomatognathic system as well as to the patient dissatisfaction with facial appearance, thus detracting from the sense of well-being (Hoppenreijs et al. 1999). Often it is not possible to adequately treat these defects solely by orthodontic measures. In such cases a combination of orthodontic and maxillofacial surgical procedures is frequently indicated for functional and aesthetic harmony in the maxillofacial region. This can be achieved by resorting to various reconstruction osteotomy methods in the maxilla and mandible; in such cases, the fragments are aligned in a previously determined new spatial relationship. Besides functional and aesthetic aspects in orthognathic surgery, pain in combination with craniomandibular disorder (CMD) has not a negligible influence on patients' satisfaction after osteotomies in the maxillofacial region.

Objectives

The aim of the present study was to evaluate by means of Helkimo's Index (1974) the extent of craniomandibular disorder on patients' satisfaction after osteotomies.

Material and Methods

Altogether, 105 patients (f=69, m=36) were clinically examined. The average age was 24 years and 3 months. The average time span between the surgical procedure and examination was 47 (9-141) months. Figs. 1 and Abb. 2 give an overview of the distribution of dysgnathia and of the surgical procedures employed. The osteotomies were managed by means of miniplates and miniscrews. An intermaxillary fixation was in place for an average of 3.5 days. The outcome was determined by follow-up examination using a standardised questionnaire and a calibrated test device. Statistical evaluation was conducted with SPSS 10.0.

Fig. 1 a-c: Patient with Class III at the beginning of the treatment

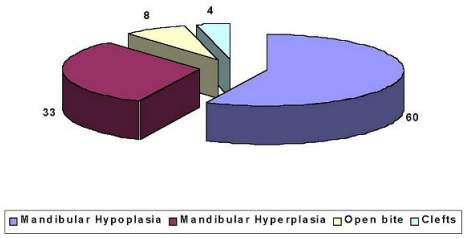


Fig. 2: Distribution of diagnosis

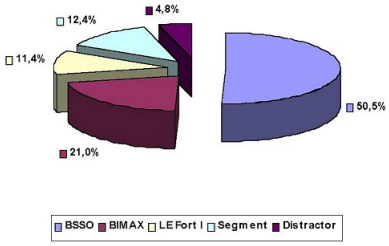


Fig. 3: Distribution of surgical procedures

Results

The vast majority of the patients (82.8%) were free of symptoms or showed slight functional impairment (Tab. 1). The most common functional impairment consisted of impaired mobility of the mandible, in particular limited ability to open the mouth (Fig. 5). Only 4 patients (3.8%) showed severe dysfunction. Anteposition of the mandible was seen in three of these patients and retroposition of the mandible in one. The patient history of these patients attested to the presence of chewing difficulties already prior to treatment. Postoperative orthodontic treatment was discontinued in the case of two patients. It was not possible to establish a statistical correlation between the type of surgical procedure and the extent of dysfunction in accordance with Helkimo. These findings concord with the results obtained by Panula et al. (2000), which were unable to establish a relationship between the severity of craniomandibular disorder and the type of reconstruction osteotomies in 60 patients following surgery for dysgnathia. Nor was it possible to identify a statistical correlation between the patient's satisfaction and the severity of craniomandibular dysfunction.

Dysfunction-Index	female		male		
	n=105	%	n=69	%	n=36	%
D 0	33	31,4	18	26,1	15	41,7
D I	54	51,4	40	58,0	14	38,9
D II	14	13,3	9	13,0	5	13,9
D III	4	3,8	2	2,9	2	5,6

Tab. 1: Helkimo-Index

Dysfunction-Index					total
	D 0	D I	D II	D III	
BSSO	18	25	6	4	53
BIMAX	5	11	6		22
LE Fort	4	8			12
Segmer	4	8	1		13
Distract	2	2	1		5

Tab. 2: Surgical Procedures and Helkimo-Index

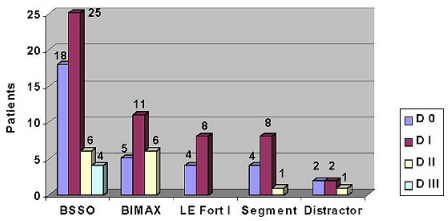


Fig. 4: Helkimo-Index and surgical procedures,
Abreviation see Fig. 2

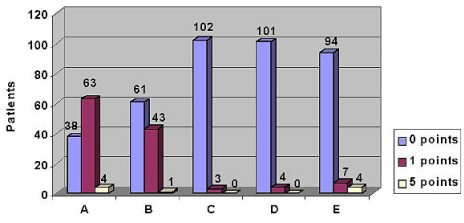


Fig. 5: A-mandible Movement, B-joint function, C-muscle tenderness, D-joint pain, E-motion pain

Discussion

The application and distribution of craniomandibular dysfunctions by means of Helkimo's Index is not unconditionally recognised (van der Weele and Dibbets 1987). Compared with the findings of the DMS-III study, a different frequency distribution is seen in the present study. Almost half the subjects (48.9 %) of this population-based study were free of symptoms and no severe dysfunction (D III) was noted in male subjects. Likewise, moderate dysfunction (D II) was seen much less commonly (3.2 %). Comparison with studies reported in the international literature draws attention to the great variance in the methods and examination criteria employed (DeClerq et al. 1995, Onizwa et al. 1995, Panula et al. 2000). The aim of combined orthodontic and maxillofacial facial surgical treatment is to achieve stable occlusion with a harmonized aesthetic facial appearance. Therefore individual risk factors that can give rise to craniomandibular dysfunctions must be borne in mind in the course of treatment and afterwards and these must be taken into consideration at an early stage in treatment. In particular, restricted mobility of the mandible should be avoided during the postoperative follow-up period; to this effect, simple myofunctional exercises and physiotherapy measures may often be indicated.

Fig. 6 a-c: Patient with Class III at the end of the treatment

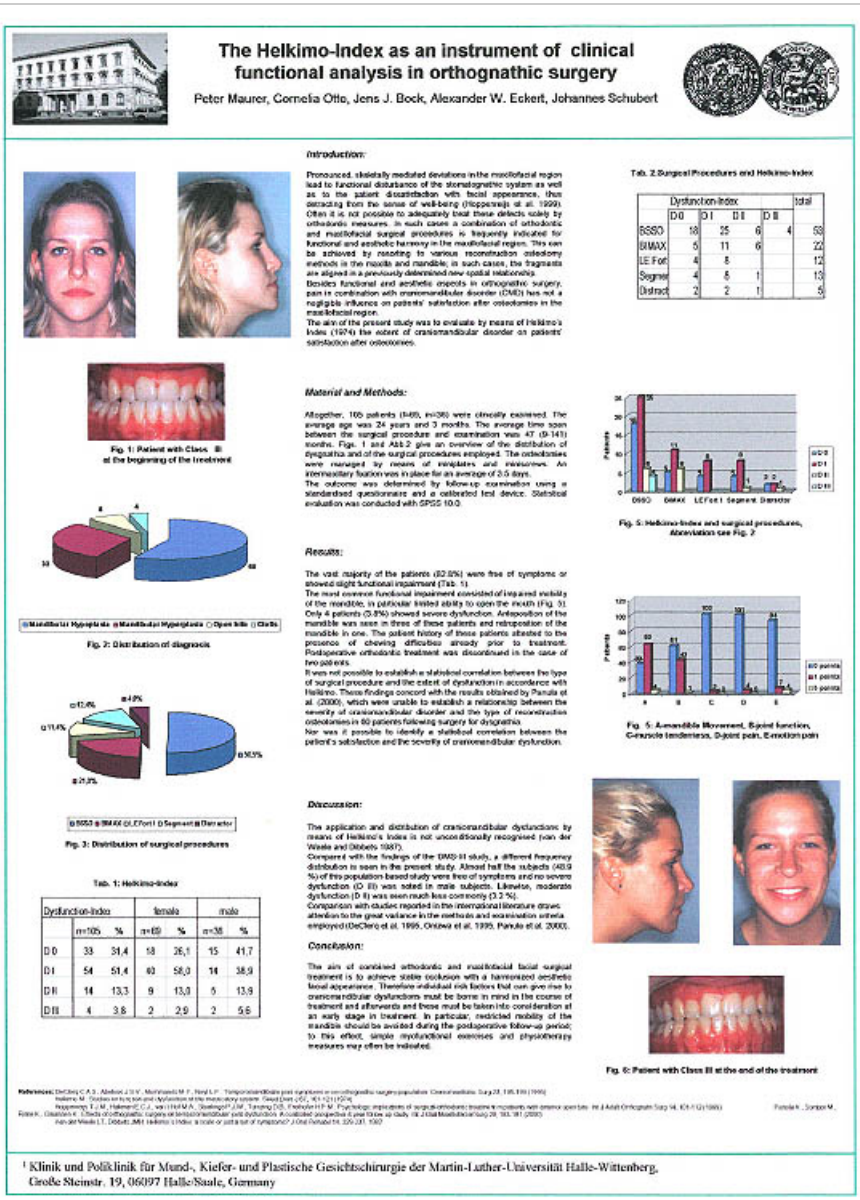
Bibliography

- DeClerq C.A.S., Abeloos J.S.V., Mommaerts M.Y., Neyt L.F.: Temporomandibular joint symptoms in an orthognathic surgery population. Craniomaxillofac Surg 23, 195-199 (1995)
- Helkimo M.: Studies on function and dysfunction of the masticatory system. Swed Dent J 67, 101-121 (1974)
- Hoppenreijs T.J.M., Hakman E.C.J., van't Hof M.A., Stoelinga P.J.W., Tuinzing D.B., Freihofer H.P.M.: Psychologic implications of surgical-orthodontic treatment in patients with anterior open bite. Int J Adult Orthognath Surg 14, 101-112 (1999)
- Panula K., Somppi M., Finne K., Oikarinen K.: Effects of orthognathic surgery on temporomandibular joint dysfunction. A controlled prospective 4-year follow-up study. Int J Oral Maxillofacial Surg 29, 183-187 (2000)
- Van der Weele LT, Dibbets JMH: Helkimo's Index: a scale or just a set of symptoms? J Oral Rehabil 14, 229-237 (1987)

This Poster was submitted by Dr. med. Dr. med. dent. Peter Maurer.

Correspondence address:
Dr. med. Dr. med. dent. Peter Maurer
Martin-Luther-Universität Halle-Wittenberg
Klinik und Poliklinik für Mund-, Kiefer- und Plastische Gesichtschirurgie
Große Steinstraße 19
06097 Halle
Germany

Poster Faksimile:



The Helkimo-Index as an instrument of clinical functional analysis in orthognathic surgery

Peter Maurer, Cornelia Otte, Jens J. Bock, Alexander W. Eckert, Johannes Schubert

[1] Klinik und Poliklinik für Mund-, Kiefer- und Plastische Gesichtschirurgie der Martin-Luther-Universität Halle-Wittenberg, Große Steinstr. 19, 06097 Halle/Saale, Germany