

“Two Faces and a Hand Scan”- Pre- and Postoperative Insights of Patients Undergoing an Orthognathic Surgery

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Abstract. The current study deals with an empirical approach to an improvement of the patient and doctor relationship of patients undergoing an orthognathic surgery. The aim is the development of an information and communication concept for a smooth and positive treatment for medicine and patient. Such an intervention is a decisive experience and needs to be treated very sensitive. Patients with jaw modulation often suffer from medical-functional as well as psychological problems. Also after surgery, the change of appearance might lead to adjustment disorder. Therefore, a well-elaborated treatment is needed and essential. Retrospective already operated patients were interviewed regarding their expectations, fear, hopes and wishes as well as their individual experience with the surgery. The addition of technical support in form of a 3D scan was also assessed. First results portray a big need of an improved medical education concept as well as an overall positive assessment of the 3D scan.

Keywords: Orthognathic surgery, medical treatment, information and communication concept, 3D Scan.

1 Introduction

Inherent or development related dentofacial abnormalities have a serious impact on medical-functional as well as on psychological well being of patients. Patients with jaw modulation often suffer from functional problems such as problems chewing, swallowing or even speaking properly. Moreover, also psychological problems e.g. emotional instability or low self-esteem because of “abnormal” appearance are just a few from many associated psychological difficulties [1-2]. An orthognathic treatment solves the functional problems of patients, but also may change their facial features. The face, as being one of the most complex parts of the body, reflects the individuality and social identity [3]. Changing ones´ face means changing ones´ identity. The face is a highly sensitive part of the identity of a person: it distinguishes persons, expresses emotions it stands for the appearance of a person [4]. Changing this

meaningful part of the body results in often-dramatic modification. Objectively speaking, a surgery improves all the issues and problems a person is dealing with and enhances quality of life [5]. However, subjectively speaking, such a surgery requires a rapid integration of ones' new facial appearance into the self-concept. Additionally, the process of an orthognathic intervention is very painful, long and risky that is why it causes a lot of fear. Last but not least, postoperative disgruntlement because of changed appearance might lead to adjustment disorder [6]. This intervention therefore has to be handled with sensitivity and with a good psychological support. In order to support patients in an optimal way, a well-elaborated treatment needs to be designed. Our main research question is in how far the psychological strain, the consequences for the individual appearance and identity changes can be supported with the help of a sensitive information- and communication strategy.

In order to develop such a concept our study is arranged into two parts. The first part depicts results on a retrospective interview and questionnaire with patients who have already undergone surgery. An overview of these results will be presented in this paper. In a second step, a prospective study is conducted with patients who are still in treatment. Participants assess a questionnaire at five different moments during a time period of 6 months with different medical education type. One is conventional with plaster models. The second is a 3D simulation [7], which already portrays the supposable facial appearance of the patients after surgery. In the end, results of the retrospective and prospective study will be evaluated, triangulated and are introduced into an information- and communication-concept.

2 Method and Results

In order to investigate patients' satisfaction and needs before, during and after a surgery, we decided on a longitudinal study with standardized and self-administered interviews and questionnaires. The first part (retro perspective) of the study was explorative to get insights into the real needs and feelings of patients with an orthognathic operation. In order to understand the individual experiences in detail and to sense the way of coping of patients that already finished their treatment, a face-to-face interview was chosen. Additionally, patients were scanned with a 3D hand scan for two purposes: firstly, for the assessment of quality and usability by patients and secondly for technical data collection.

Interview and Questionnaire. An interview and questionnaire guideline was created, based on theoretical research and the status quo of findings in the relevant research field. Interviews were conducted face-to-face; with questionnaires, we reached participants via Internet. The survey instruments consisted of questions concerning: demographic data, personality traits, information type, positive and negative expectations before surgery and in how far they came true afterwards, social reaction, acceptance and support before and after surgery, assessment of education and treatment of doctors as well as acceptance of 3D scan and outlook for future patients.

Sample. 22 Participants with jaw surgery experience took part in the study with an age range from 20 to 62 years (M=33;SD=12). 14 participants were female and 8 were male. Participants were former patients of the university hospital Aachen and were contacted by their agreement to **take** part into research. Surgery was undergone between 3 and the latest 8 years ago from time of interview. The profession of patients compasses a wide range of activities (student, employees, free-lancer, baker, cosmetician, etc.).

Results. Results were analyzed by **frequencies** and qualitative data analysis by Mayring [8]. Open answers were collected and categorized and will be reported in the following part.

- *Reasons for surgery.* As people are individual, also reasons for undergoing surgery differs from patient to patient. The most mentioned reason was the functional one (45,5%, problems chewing), followed by aesthetic reasons (36%) such as facial appearance. Beside, social (5%), comorbid disorders (5%) and no medical reasons (8%) were named.
- *Information search.* Asked about where patients searched for information about the surgery and healing process, 55% received their information in the medical education by the medicine. Specifically asked, in which kind of media they informed themselves, Internet (60%), other experts (30%), secondary literature (30%) and contact with experienced patients were mentioned (18%). It turns out, that the medical education seems to be the most important information resource.

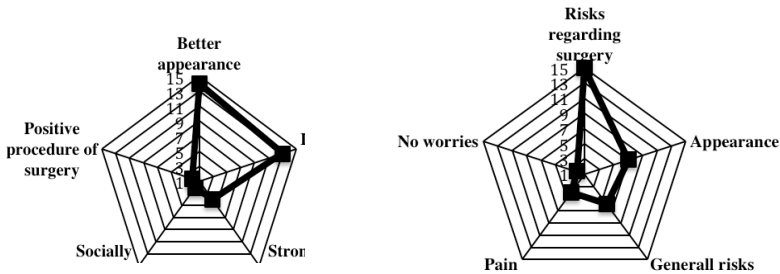


Fig. 1. Left: Categories of named expectations. Right: Categories of named worries. Multiple replies possible (N=22).

- *Expectations and hopes.* Participants were asked to remember their expectations they had before undergoing surgery. Figure 1 portrays the number of namings, participants reported. Multiple replies were possible. The outer black line in figure 1 left depicts the most mentioned expectations before surgery. Better appearance (14 namings) as well as the improvement of the jaw function (13 namings) was of great importance. Expectations and hopes, affecting the surgery, were often attached to

the social life of the patients and their optic appearance. One expectation, which stands for the improvement of appearance, was “I was looking forward to have an open, unforced laugh” (female, 42 years). Functional reasons for the treatment were on the one hand directly linked to problems with chewing, swallowing, etc. On the other hand patients reported about physical complaints that derive from the malposition of the jaw, such as headache and tinnitus. Participants told us about suffering from physical complains and the decreasing quality of life resulting from this. One participant described e.g.: “Ringing in my ears and headache accompanied me daily. I had a hard time going to work, I was so restless due to the ringing and lack of sleep” (male patient, 40 years). His expectation on the surgery was evident (functional improvement). All in all, the responses correspond to the big influence a jaw modulation has both on the psychological well being and the functional problem as well the hope to solve or at least improve these problems. Finally, 10 patients stated that 100% of their expectation came true; the rest stated that at least 50% to 80% of their hopes arrived.

- *Fears and worries.* With such a hard and long treatment also fears and worries come along with hopes. Again multiple responses were possible. Participants were mainly afraid of emerging risks (15 naming) due to the surgery such as fear of complications, dying nerves as well as bad consequences among others. Fear of not receiving the expected appearance followed (7 naming), next to fear of pain (4 naming) (see figure 1 right). Half of the patient reported that at least one worry came true (nerves dying, strong pain, etc.).

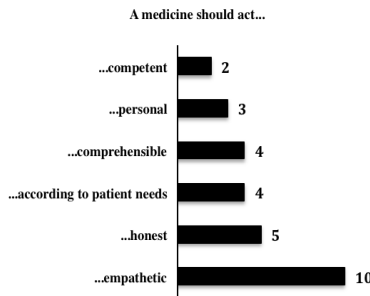


Fig. 2. Reported advice; Multiple responses possible ($\Sigma=28$ responses; $N=22$)

- *Advice to medicines.* Since the aim of the retrospective investigation was to get deeper insights into patient’s needs who undergo surgery, the most important question was regarding the patients advice for medicines. It was an open question; multiple responses were possible. As being most important, participants mentioned the relationship between medicine and patient (25 naming), followed by communication and interaction (16 naming), good preparation of time and process after surgery (11 naming), medical expertise (10 naming), honesty (8 naming) and medical interaction (5 naming). Moreover a scenario was defined and had to be answered: “Imagine, a medicine would ask you as an expert to give him advice on what he

has to focus on particularly in order to be a good medicine?”. Results can be seen in figure 2.

- *3D scan*. The willingness to include technical support in form of a 3D scan was assessed. Patients were introduced into a 3D program [7], a picture of their face was taken and it was illustrated how the face could be turned and changed with the help of program features. This method allows, to give patients a possible picture of their face before surgery, portraying how they will look afterwards. 100% of the participants assessed it as a very positive method.

3 Discussion

This study represents a first empirical approach to an improvement of the patient and doctor relationship of patients who undergo orthognathic surgery. The aim was to identify first aspects among the medical treatment, which are essential for the development of an information and communication strategy including innovative technical support in form of a 3D scan. In the study former patients who have already experienced their treatment were interviewed and data was collected qualitatively. The data portray that patients with jaw malposition suffer from psychological and physical difficulties. The decision for a correction was described as a very decisive experience, which carries many worries but also expectations. Information about the treatment was mainly collected in the medical education the medicine has to hold before surgery. Therefore, the medical education is among the whole treatment the essential source for patients questions and needs special focus regarding a treatment improvement. As participants reported, the information has to be communicated sensitively and patients discomfort has to be taken seriously. Additionally, data showed that a visualization of the expected treatment result of the face would be very appreciated by patients and might lead to a higher overall satisfaction of the long and hard process.

The current data presented qualitative data in a retro perspective. Based on these findings, a second study is already running, focusing on the prospective time. Patients who are going to receive surgery participate and assess on five different periods of time the treatment (before surgery, 10 days after, 1 months after, 3 and 6 months after surgery). In order to evaluate the medical education including a 3D scan, patients are randomly divided into two groups. One groups receives the conventional medical education, the second group is educated with the help of the 3D scan of their current face before surgery converted into the expected face after surgery. In the end, results of the retro perspective study and the prospective study will be triangulated and introduced into an information and communication strategy.

Limitations of study and research duties. So far the study only includes German participants. The influence and experience of participants being from different cultures has to be included. A further aspect is the size of our sample. In order to report representative data, the sample has to be enlarged. On a long term, the question appears in how far an information and communication strategy in the field of jaw malposition under regard of technical devices for patient information is transferable to other medical fields.

4 Conclusion

In this paper, we presented an empirical approach to the improvement of the patient and doctor relationship especially in the orthognathic treatment. Interviews were conducted with patients who have already undergone a surgery. Results show, that there is a big need of the improvement of the medical education including innovative technical support (3D scan). The evaluation of such a treatment method is currently running in the prospective part of the study. The results will finally serve for the development of an information and communication concept for the medical treatment with the addition of 3d scan.

Acknowledgements. Authors would like to thank Florian Peters, Laura Burbach and Sarah Völkel for their research support. A special thank goes to all the participants who took part. The Excellence Initiative of the German Research Foundation DFG funded this work.

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