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Paweł Stępień[1, A–D, F], Hanna Gerber[2, E, F]

Clinical Follow-up Examination and the Patients' Perception – a Comparative Analysis of Treatment Outcomes Based on a Study Performed Among Patients with Fractures of the Upper and Middle Thirds of the Facial Skeleton

Kliniczne badania kontrolne a subiektywne odczucia pacjenta – analiza porównawcza wyników leczenia na podstawie badań przeprowadzonych wśród pacjentów ze złamaniami w obrębie górnego i środkowego piętra twarzoczaszki

[1] Jan Mikulicz-Radecki University Teaching Hospital, Wrocław, Poland
[2] Department of Maxillofacial Surgery, Wroclaw Medical University, Wrocław, Poland

A – research concept and design; **B** – collection and/or assembly of data; **C** – data analysis and interpretation; **D** – writing the article; **E** – critical revision of the article; **F** – final approval of article

Abstract

Background. Patients with facial skeleton injuries constitute a numerous group. Their treatment should enable the elimination of any functional, morphological, and esthetic disorders. Remote follow-ups allow us to observe the persistent disorders and gather information leading to surgical technique improvement. However, data on patients' perception can significantly add to the results assessment.
Objectives. The aim of the paper was a comparative analysis of the outcomes obtained in the follow-up examination and a questionnaire survey among patients with past facial skeleton injuries.
Material and Methods. The authors analyzed 266 patients. The follow-up examination, attended by 70 (26.3%) patients, was performed within 1–3 years after treatment. Also, an anonymous questionnaire was sent to the patients; 93 of them answered the questionnaire. Patients were asked to assess the management results on the basis of their experience with the treatment process, and the persistent disorders.
Results. The follow-up data proved a positive outcome in 57 (81.4%) patients; an unsatisfactory outcome was noted in 13 (18.6%) patients. The questionnaire results were presented as the patients' satisfaction or dissatisfaction with the treatment effects. A positive outcome was obtained in 88.8%; an unsatisfactory outcome referred to 11.2%. The results demonstrate that even the more frequent present disorders cannot be unequivocally converted into data on the patients' satisfaction with the treatment effects.
Conclusions. A consideration of the patients' own evaluation should be an inherent part of the management results assessment. A complex results analysis lets us draw conclusions to improve not only the treatment methods, but also the patients' psychical comfort **(Dent. Med. Probl. 2015, 52, 4, 401–407).**

Key words: questionnaire, follow-up, outcome assessment, patient satisfaction, facial injuries.

Słowa kluczowe: ankieta, badania kontrolne, ocena wyników leczenia, zadowolenie pacjentów, urazy twarzoczaszki.

Together with the rapidly progressing civilizational development and pace of everyday life, one can observe an inevitable rise in the number of accidents, frequently associated with injuries in the region of the craniofacial skeleton [1, 2]. Such imaging techniques as, among others, computed to-

mography or magnetic resonance, most often applied quickly after the injury, allow us to precisely assess the extent of the damage and to plan appropriate treatment [3]. These techniques are characterized by high accuracy, and thus offer objective and extremely precise imaging of the damages within the hard and soft tissue that result in various types of disorders. Immediately after the injury and the conducted surgical treatment, the patient, because of their general condition, post-traumatic shock, hematomas, edemas, and pain, is not able to rationally refer to their own health state. Early treatment outcomes are then assessed with clinical examination, supported by radiological diagnostics.

Remote follow-up examinations are an inherent part of the management and recovery process in patients with injuries. They are performed within various periods after the completion of treatment. On their basis, surgical techniques, reconstruction materials etc. can be improved. Supported by the physicians' knowledge, as well as various tests carried out, they allow us to assess the management outcomes with reference to morphological, esthetic, and functional disorders. One cannot, however, forget about the data on patients' perception, which should add to the management results assessment [4]. In fact, one can observe situations in which, although no esthetic or functional disorders are detected, the patient in not satisfied with the treatment effects. Sometimes, discrete perception differences exist, conditioned by somatic variability, different stimulus sensitivity depending on sex, etc. That is why such studies allow to honestly assess if the obtained treatment result can be referred to as satisfactory not only from the physician's point of view, but, first of all, for the patient.

The aim of the paper was a comparative analysis of the treatment outcomes obtained in the follow-up examination and questionnaire survey among patients with past facial skeleton injuries.

Material and Methods

The authors analyzed 266 patients, including 233 (87.6%) men and 33 (12.4%) women, hospitalized in the Department and Clinic of Maxillofacial Surgery of the University Clinical Hospital in Wrocław, Poland, in the years 2009–2011 for the cause of injuries resulting in different types of fractures of the upper and middle thirds of the facial skeleton. The clinical follow-up examination was performed within the period of 1–3 years after the completion of treatment in 70 (26.3%) patients, including 55 men and 15 women (Fig. 1).

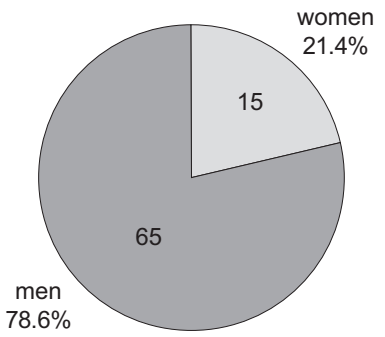

Fig. 1. The structure of the patients who underwent follow-up examinations according to sex

The aim of the examination was to verify the presence of any persistent functional, morphological, or esthetic disorders. This was obtained with a subjective medical examination supported by simple tests verifying the extent of the disorders (active eyeball movement test, thermal and pain test in the assessment of branch II of the trigeminal nerve dysesthesias, jaw opening measurement, visual assessment of facial post-traumatic asymmetry and postoperative scars). At the same time, an anonymous questionnaire, designed on the basis of the authors' and other centers experience, was sent to all patients. The number of patients who answered the questionnaire was 93 (34.9%), including 76 men and 17 women (Fig. 2).

The patient groups did not differ in a statistically significant way with reference to the diagnosis (Table 1) or the treatment method (Table 2, 3).

The comparative analysis comprised, among others, chosen functional disorders of the visual system (such as diplopia) and the stomatognathic system (associated with difficulties in jaw opening and occlusal implications), neurological disorders associated with a peripheral damage to branch II of the trigeminal nerve, morphological and esthetic disorders manifesting in facial deformation, as well as scars resulting from surgical intervention (Table 4).

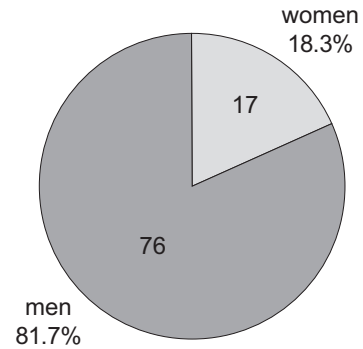

Fig. 2. The structure of the surveyed patients according to sex

Table 1. Type of fractures in both analyzed groups

Diagnosis	Examined patients n = 70	Surveyed patients n = 93	Comparison p
OFIF	18.6%	18.3%	0.877
ZOF	31.4%	38.7%	0.425
ZMOF	34.3%	28.0%	0.489
UFD	5.7%	4.3%	0.965
OND	0.0%	1.1%	0.903
FONF	5.7%	4.3%	0.965
CFF	4.3%	3.2%	0.959
Does not remember	0.0%	2.2%	0.591

OFIF – orbital fundus isolated fracture, ZOF – zygomatic orbital fracture, ZMOF – zygomatic maxillary orbital fracture, UFD – upper face dislocation, OND – orbito-nasal dislocation, FONF – frontal orbital nasal fracture, CFF – craniofacial fracture.

Table 2. Type of treatment applied in the examined patients

Type of treatment	Total n = 70	Women n = 15	Men n = 55	Women vs men p
1. Surgical	59 (84.2%)	14 (93.3%)	45 (81.8%)	0.435
2. Conservative	11 (15.8%)	1 (6.7%)	10 (18.2%)	
2a. Lack of evident indications to surgical treatment	9 (12.9%)	1 (6.7%)	8 (14.5%)	1.000
2b. Lack of the patient' consent to surgical treatment	2 (2.9%)	0 (0.0%)	2 (3.7%)	

Table 3. Type of treatment applied in the surveyed patients

Type of treatment	Total n = 93	Women n = 17	Men n = 76	Women vs men p
1. Surgical	80 (86.0%)	15 (88.2%)	65 (85.5%)	0.923
2. Conservative	13 (14.0%)	2 (11.8%)	11 (14.5%)	0.923
2a. Lack of evident indications to surgical treatment	12 (12.9%)	2 (11.8%)	10 (13.2%)	0.807
2b. Lack of the patient' consent to surgical treatment	1 (1.1%)	0 (0.0%)	1 (1.3%)	0.403

Table 4. Disorders observed in the period of 1–3 years after treatment completion in the surveyed and examined patients

Symptoms after treatment (at present)	Examined patients	Surveyed patients	Comparison p
Double vision (diplopia)	35.3%	34.1%	0.788
Dysesthesias of branch I/II of the trigeminal nerve	45.9%	68.3%	**0.021**
Facial deformations	30.8%	52.1%	0.050
Limited jaw opening	0.0%	8.3%	0.482
Occlusal disorders	0.0%	46.2%	**0.034**
Scars associated with surgical intervention	14.0%	28.0%	0.103

Bold denotes statistical significance ($p < 0.05$).

Results and Discussion

Based on the data obtained from the follow-up examination, the results were referred to as good if no functional, morphological, or esthetic disorders were observed; satisfactory if there were no functional disorders of the visual or stomatognathic system, but slight dysesthesias concerning branch I or II of the trigeminal nerve were noted (very discrete morphological and esthetic disorders manifesting as inconsiderable scars or facial asymmetry caused by the injury were also al-

Table 5. Treatment outcome assessment in the examined patients according to sex

Treatment outcome assessment	Total n = 70	Women n = 15	Men n = 55	Women vs men p
Good	30 (42.8%)	5 (33.3%)	24 (43.6%)	0.306*
Satisfactory	27 (38.6%)	6 (40.0%)	22 (40.0%)	
Unsatisfactory	13 (18.6%)	4 (26.7%)	9 (16.4%)	

* Pearson's chi-square test.

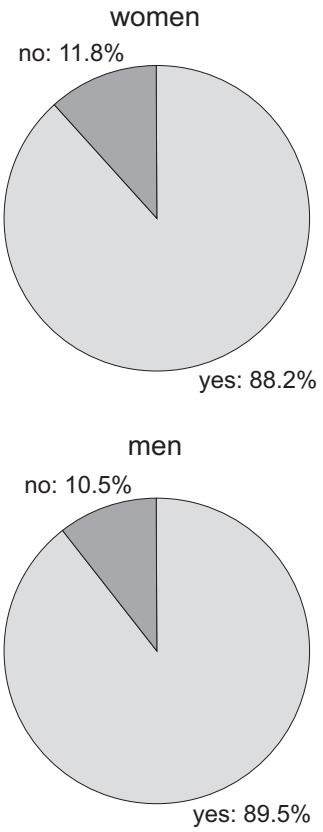

Fig. 3. Questionnaire answers to the question concerning the patients' satisfaction with the treatment effects according to sex

lowed); and unsatisfactory if functional disorders and/or major morphological and esthetic disorders were diagnosed (Table 5).

Thus, a positive treatment outcome in the follow-up examinations of the group of 70 patients with regard to the functional, morphological, and esthetic aspects was obtained in 57 (81.4%) patients; an unsatisfactory treatment outcome, where the desirable treatment effect was not reached, referred to 13 (18.6%) patients.

In the group of the 93 surveyed patients, results were presented in the context of their satisfaction or dissatisfaction with the treatment effects (Fig. 3), with reference to the data obtained in the questionnaire survey as for coexisting disorders associated with the past injury (Table 6).

Injuries in the region of the craniofacial skeleton complicated with fractures of the upper and middle thirds of the facial skeleton are a more and more frequent phenomenon, as indicated in the authors' and other centers research [4, 5]. The vast majority of patients presenting with this type of injury are men [5–9], most often young, aged 21–30 years [1, 10–13]. The main reason for fractures in this group is physical violence, commonly associated with alcohol or other psychoactive substances abuse [5, 8, 9, 13–16]. However, still a considerable group of patients are victims of communication accidents [15, 17–19].

Table 6. Functional, morphological, and esthetic disorders observed in the surveyed patients according to sex

Variable	Total n = 93	Women n = 17	Men n = 76	Women vs men p
Are there still any traces remaining after the injury?				
Scars resulting from the injury	14 (15.1%)	3 (17.6%)	11 (14.5%)	0.747
Postoperative scars	26 (28.0%)	5 (29.4%)	21 (27.6%)	0.881
Facial deformations	25 (26.9%)	4 (23.5%)	21 (27.6%)	0.730
Double vision	14 (15.1%)	4 (23.5%)	10 (13.2%)	0.283
Dysesthesias of lip, cheek, or nose skin	41 (44.1%)	12 (70.6%)	29 (38.2%)	**0.015**
Occlusal disorders	12 (12.9%)	4 (23.5%)	8 (10.5%)	0.148
Other	3 (3.2%)	1 (5.9%)	2 (2.6%)	0.485
No disorders	15 (16.1%)	0 (0.0%)	15 (19.7%)	**0.046**

Bold denotes statistical significance ($p < 0.05$).

When assessing the treatment effects in facial skeleton fractures, the authors applied the fracture classification by Samolczyk-Wanyura [20]. With the consideration of the biomechanics and architecture of the craniofacial skeleton, it was observed that the most frequently diagnosed fractures were those that arose as a result of injuries with low, lateral application area, most often aiming at the region of the zygomatic bone; this is also confirmed in other authors' research [9, 21–24]. These types of injuries are usually treated surgically with the usage of open reposition with stable osteosynthesis, which guarantees best management outcomes [4, 7, 25–28]. Unfortunately, modern radio-imaging systems and the still improved surgical techniques do not allow to definitely eliminate complications, presenting themselves as functional, morphological, and esthetic disorders. These concern a significant percentage of patients, sometimes contributing to a considerable discomfort in everyday life. The disorders depend on numerous factors, such as the extent of the damage resulting from the injury, the time that passed between the injury and the beginning of treatment, the type of surgery technique, and many others [4, 29–34]. The most frequent disorders observed with this type of fractures are dysesthesias of branch II of the trigeminal nerve, facial deformations (presenting in various forms, from discrete flattenings to spoiling distortions), diplopia, limited jaw opening [4, 7, 22, 33]. In the results obtained from the clinical follow-up examinations and the questionnaire survey, a disproportion associated with the patients' sex could be noted concerning some of the disorders. This especially referred to dysesthesias in the region innervated by branch II of the trigeminal nerve, as well as to facial deformations. The differences can probably be explained by certain dissimilarities in the somatic structure of the sexes, specific sensitivity to stimuli, including pain (as a result of, among others, differences in the hormone balance), as well as different attention paid to the external image [35–37].

The higher percentage of particular disorders reported by the surveyed patients as compared with those observed in the examined patients could suggest a low level of satisfaction with the achieved therapeutic effects. However, 88.2% of women and 89.5% of men who answered the questionnaire stated their satisfaction with the management outcomes; 11.8% of women and 10.5% of men were dissatisfied. Clinical examinations, in which the number of the observed disorders turned out lower that mentioned by the surveyed patients, pointed at slightly worse treatment effects, as a positive outcome was obtained in 81.4% of patients, and a negative one in 18.6%. This means that not all dysfunctions arising as a result of an injury and treatment fully negatively influence the ultimate outcome. As other authors note, the patient's satisfaction with the performed treatment is conditioned not only by their approval of the achieved effects, but also by the individual approach concerning the quality of information passed to them during the whole management period and the way the information is passed [38]. The opinion that the factor of time induces the patients' acceptation of particular disorders resulting from the past injury could also be justified, although probably only with regard to the disorders that do not significantly influence the comfort of everyday life.

The results of the study seem to confirm the usefulness of performing such investigations as described above. They point out that taking into account the patient's own evaluation should be an inherent part of the management results assessment, especially in the remote perspective. Owing to the complex management results analysis, based on the components described in the paper, the emphasis on improving treatment methods and techniques will be possible.

The results demonstrate that even the more frequent present disorders cannot be unequivocally converted into data on the patients' satisfaction with the treatment effects.

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Address for correspondence:

Paweł Stępień
Jan Mikulicz-Radecki University Teaching Hospital
Borowska 213
50-556 Wrocław
Poland
Tel.: 71 734 36 95
E-mail: stepien0@poczta.onet.pl

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