The impact of acute post-extraction oroantral communications surgical treatment on patients’ quality of life in early post-operative period

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Key words: oroantral fistula, quality of life, orthodontic space closure

The research objective is to study the impact of plastic surgery treatment of acute post-extraction oroantral communications on patients’ quality of life in early post-operative period.

Materials and methods. The study included 41 patient aged between 18 and 58 years receiving treatment of maxillary sinus perforation, which was caused by tooth extraction. The patients were divided into 3 groups – 14, 12 and 15 persons respectively. Plastic surgery of the oroantral communication in the first group was done in accordance with the methods suggested by the authors using collagen cone and membrane. The same surgery in the second group was done with PRF (Platelet-rich fibrin). In the third (control group), the communication was closed by the vestibular flap following the Rehrmann method.

Results. Patients’ quality of life evaluation after plastic surgery treatment of acute post-extraction oroantral communication show the decrease of its general indicator in early post-operative period in all groups of patients. The general quality of life indicator (well-being indicator) shows a tendency to increase over the first 24 hours after the surgery in both study and control groups. This may mean that a relatively small trauma in a maxilofacial area has a significant influence on patients’ perception of their condition and well-being. Absolute numbers of well-being indicator over the first 24 hours after the surgery in the third group were almost 1.5 times higher than those in the groups 1 and 2. In a comparative study of the groups 1 and 3 and then the groups 2 and 3, we observed a significant difference between well-being indicator levels (P < 0.01). The control group demonstrated the return to the pre-operative quality life values on the 7-th day after the surgery. While at the same time, those values in the study groups were equal to the pre-operative ones already on the 4-th day.

Conclusions. Operation trauma which was caused by the plastic surgery for closure of acute oroantral communication leads to the decrease of patients’ quality of life (oral-related conditions), which correlates with the volume of a surgery and its complexity. The use of less traumatic methods of oroantral communication plastics facilitate the statistically significant decrease of these plastics negative impact on patients’ quality of life in early post-operative period and enables the earlier recovery.

Вплив хірургічного усунення гострих післяекстракційних ороантральних сполучень
на якість життя пацієнтів у ранньому післяопераційному періоді

І. М. Готь, І. С. Сороківський, Ю. О. Медвідь

Мета роботи – встановлення впливу різних методик пластики гострих післяекстракційних ороантральних сполучень на якість життя пацієнтів у ранньому післяопераційному періоді.

Матеріали та методи. До дослідження заприймали 41 пацієнта віком від 18 до 58 років, які перебували на амбулаторному лікуванні з приводу перфорацій верхньощелепного синуса, що виникли як наслідок відібрання зуба. Пацієнтів подіяли на 3 групи по 14, 12 та 15 осіб відповідно. У першій групі пластіку ороантрального сполучення виконували методом авторами використання колагенових конуса та мембрани. У другій групі для закриття перфорацій верхньощелепного синуса використовували метод Рехмана – трапецієподібним слизовоокісним клаптом.

Результати. Оцінювання змін показників якості життя пацієнтів після пластіки гострих післяекстракційних ороантральних сполучень засвідчує зміну загального показника якості життя в ранньому післяоперативному періоді у всіх групах пацієнтів. Тенденція до збільшення загального показника якості життя в першу добу характерна як у дослідних, так і в контрольній групах. Це свідчить, що операційна травма порівняно невеликого об’єму в щелепно-лицевій ділянці впливає на суб’єктивне сприйняття свого стану пацієнтами. Абсолютні значення загального показника якості життя на першу добу у третій групі майже в 1,5 раза перевищували аналогічні у 1 і 2 групах. При попарному порівнянні перших і третіх груп та другіх і третіх груп спостерігали значну різницю між загальними показниками якості життя (р < 0.01). У групі порівняння поверхні загального показника якості життя до значень, що спостерігалися у передоперативному періоді, відбулось на 7 добу після хірургічного втручання. Водночас у дослідних групах загальний показник якості життя не відрізнявся від доопераційного вже на четверту добу.

Висновки. Операційна травма як наслідок пластичного закриття гострого ороантрального сполучення спричиняє погіршення якості життя пацієнтів у ранньому післяоперативному періоді, але значність цього погіршення залежить від складності патологічних умов і об’єму хірургічного втручання.
The acute post-extraction oroantral communication is one of the most common complications which occur in the course of upper molars extraction [10]. Commonly accepted methods of such conditions treatment as a vestibular flap, palatal flap or a Bichat’s fat pad etc., involve local tissues, which inevitably leads to additional surgical trauma. Thus, combined with the procedure of a multi-root tooth extraction, they trigger a chain of physiological reactions in local tissues and manifest in pain, edema, limitation of speaking and chewing functions etc. and as a result affect the quality of patients’ life [4].

The study of a physical, social and psychological influence of health condition on human’s life has been conducted since the middle of 20th century. One of the first instruments for work with patients beyond clinical and laboratory examinations, is Karnofsky Performance Status Scale Index, developed in 1947 for evaluation of cancer patients’ quality of life [6]. In 1948, WHO established the definition of health according to which, health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity [14], which, in turn, brought up new requirements to the health care system overall and re-directed it from the treatment of illness itself towards the patient treatment as a complex biological unit, who, in addition to the basic morphological and functional characteristics, possesses some individual psychological and social ones.

Nowadays, the patients’ quality of life evaluation is gaining more and more importance in the course of effective medical services providing as well as it has established itself as an independent indicator of patients’ condition in medical social expertise, prognosis, treatment plans and rehab programs. The definition of a quality life is projected to the dentistry branch of medicine where it narrows to the notion “Oral health related quality of life”, which has been a part of scientific and clinical practices since 1990s [16,18].

Over the recent years there have been developed more than 10 main indexes which can evaluate the impact of oral health on the patients’ quality of life [1].

Among the commonly accepted oral health related quality of life evaluation methods, the one that stands out and deserves special attention is OHIP-14 questionnaire. Oral Health Impact Profile (OHIP) measures individuals’ perception of social impact of dental problems on their well-being [17]. A full version of the questionnaire- OHIP-49 consists of 49 questions, which cover seven concept formulated dimensions based on the theoretical model of oral health by Locker [13] and adapted to basic classification of impairments, disabilities and handicaps of WHO [20]. OHIP-14 was developed as a short version for cases where a full set of 49 questions is inappropriate [16].

This tool is widely used in dentistry to estimate the effectiveness of orthopedic rehabilitation of dental patients [3,7], after orthogнатic and reconstructive surgeries [5,15] to study new methods of parodontitis treatment [2] etc. However the test sensitivity of this method with regard to the estimation of quality of life in early post-operative period in the alveolar ridge area is of special interest [4,12].

The purpose of our study is to establish the impact of different methods of plastics in the course of acute post-extraction oroantral communication treatment on patients’ quality of life in early post-operative period.

Materials and methods

The study included 41 patient aged between 18 and 58 years, receiving treatment for perforation of maxillary sinus, which was caused by the tooth extraction.

The patients were divided into 3 groups – 14, 12 and 15 persons respectively.

Plastic surgery of the oroantral communication in the first group was done in accordance with the methods suggested by the authors using collagen cone and membrane.

Upon confirmation of oroantral communication, infiltration anesthesia was performed in the area of intervention followed by the revision of the alveolar socket of the extracted tooth. After a very careful deepithelization of marginal gingiva, alveolar socket was filled (without compression) with colla-
Table 1. WBI of the patients in pre-operative period (points), M ± m

<table>
<thead>
<tr>
<th>Group</th>
<th>Before the surgery</th>
<th>1 day</th>
<th>2 day</th>
<th>3 day</th>
<th>4 day</th>
<th>5 day</th>
<th>6 day</th>
<th>7 day</th>
<th>8 day</th>
<th>9 day</th>
<th>10 day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>4.14 ± 0.51</td>
<td>4.02 ± 0.54</td>
<td>3.93 ± 0.59</td>
<td>4.10 ± 0.59</td>
<td>3.93 ± 0.59</td>
<td>4.02 ± 0.54</td>
<td>3.93 ± 0.59</td>
<td>4.10 ± 0.59</td>
<td>3.93 ± 0.59</td>
<td>4.02 ± 0.54</td>
<td>3.93 ± 0.59</td>
</tr>
<tr>
<td>Group 2</td>
<td>23.36 ± 0.80***</td>
<td>24.42 ± 0.69**</td>
<td>23.36 ± 0.80***</td>
<td>24.42 ± 0.69**</td>
<td>23.36 ± 0.80***</td>
<td>24.42 ± 0.69**</td>
<td>23.36 ± 0.80***</td>
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<td>23.36 ± 0.80***</td>
<td>24.42 ± 0.69**</td>
<td>23.36 ± 0.80***</td>
</tr>
</tbody>
</table>

Significance of the difference between the numbers before and on the certain day after the surgery:
* P < 0.05; ** P < 0.01; *** P < 0.001.
36.67 ± 1.27 points compared to that before the surgery – 3.93 ± 0.50. Statistically significant deterioration of WBI (P < 0.001 and P < 0.01) was observed until the 6th day. For the 7th day this indicator was 4.07 ± 0.62 points and was not significantly different from that before the operation (P > 0.05).

After comparing the WBI data in patients from all groups (Table 2), we did not find any significant difference in pre-operative period (P > 0.05). While in paired comparison study, where the findings for the first and the second groups were contrasted to those of the control group (group 3), the data showed a significant difference (P < 0.001), which had been persisting until the 6th day. While at the same time, in comparative study of the first and second groups, the difference in values obtained during the whole period of study was found invalid (P > 0.05).

It is also worth mentioning that in the patients of the first and second study groups, WBI returned to its initial points on the 4th day after the surgery, while in those from the 3rd (control) group – only on the 7th day (Fig. 1).

Discussion
The results of WBI changes after the plastics of acute post-extraction oroantral communication indicate a significant deterioration (P < 0.01) of patients’ quality of life in early post-operative period in all groups in this study. Tendency to increase of WBI points on first day was observed in all groups (study and control) (36.67 ± 1.27, 23.36 ± 0.80 and 24.42 ± 0.69 points on the 1st, 2nd and 3rd groups compared to 4.14 ± 0.51, 4.00 ± 0.54 and 3.93 ± 0.50 points before the surgery, P < 0.001). These findings are relevant to other studies, done on surgical interventions in the alveolar ridge area of jaws [12]. This may mean that a relatively small trauma in maxillofacial area is characterized by the significant impact on the subjective perception of their condition from the patients’ perspective.

Mean values of WBI during the first day in the third group (36.67 ± 1.27 points) were almost 1.5 times higher than those of groups 1 and 2 (23.36 ± 0.80 and 24.42 ± 0.69 points respectively, P < 0.001 (Fig. 2a)). In paired comparison study between the first and third, and the second and the third groups, we observed a statistically significant difference in WBI (p < 0.01). In our opinion, it is due to the fact that plastics of oroantral communication done by the Rehrmann method, which was performed on the patients of the control group, involve some additional incisions to form a trapeze-shape flap and further mobilization by a horizontal cross of the periosteum in the trapeze base. Such procedure causes the release of inflammatory mediators, which is a natural reaction of tissues to the surgical trauma. Histamine, serotonin, bradykinin and prostaglandins, which are released in the area of intervention, cause post-operative pain and edema. These, in turn, are the main triggers of deterioration of patients’ quality of life [4]. Also, surgical method which was applied to the patients of the 3rd group, involved crown displacement of a mucosal periosteal flap, which caused a considerable reduction in the depth of oral vestibule and, as a result, cheek mobility. This led to a considerable limitation of movements during eating and speaking.

According to the findings, obtained in this study, we can assume the surgical methods, which minimize the trauma and alterations in oral vestibule, lead to the decrease of a
post-operative discomfort for patients and functional lesions already on the first day following the surgical intervention.

In control group, return to pre-operative level of WBI was observed on the 7th day after the surgical intervention (4.07 ± 0.62 points as opposed to 3.93 ± 0.50 points before the surgery). While at the same time, in study groups the WBI was not significantly statistically different from the pre-operative level already on the 4th day (P > 0.05) (Fig. 2b). Fast recovery of quality of life related to oral health in patients who underwent plastic surgeries of oroantral communications using less invasive methods, may be an indicator of the fact, that psycho-emotional sphere of human nature, as well as individual’s social and physical activity, are closely connected to the recovery of physiological status of maxillofacial area.

Conclusions

1. Surgical trauma which occurred in the course of plastic closure of acute oroantral communication leads to deterioration of patients’ quality of life in terms of their oral health.

2. The level of WBI increase and period of its recovery correlates with the volume of surgical intervention and its complexity.

3. Less invasive methods of oroantral communication plastics enable a statistically significant reduction of negative impact caused by surgical intervention on patients’ quality of life in early post-operative period and facilitate its fast recovery.

Perspectives for further studies. The results of given study indicate a perspective implementation and improvement of new methods of acute oroantral communications plastics, which may have less considerable influence on patients’ quality of life. The study of suggested methods of plastic potential results and their impact on morphology and function of soft and hard tissues of alveolar ridge make the base for the potential further scientific research.

References


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