

# Prophylaxis and treatment of the traumatic injuries of maxillo-facial region, complicated with surgical infections

Teona Danelia

Department of Surgical Stomatology, Tbilisi State Medical University, Georgia

## ABSTRACT

Based on the 135 patients with mechanical injuries of maxillo-facial region, have been identified the "risk-factors" of the infection of the soft tissues and bones, including the gunshot wounds with necrotic and lacerated tissues, penetrated in the cavities; in adequate primary delayed closure of the wound; delayed admittance; severe complex injuries. Have been studied primary contaminated wound micro flora during the admittance and character of the transformation of the infectious agent. Have been identified the nosocomial strains of the germ, their susceptibility towards the 35 antibiotics using the serial dilution technique. Depending on the severity of injuries, some authors suggest the short 3 days course of antibiotic administration using the second generation cephalosporins and hemi-synthesized antibiotics. During the severe complex traumas, the method of choice should be considered desquamated therapy using the carbapenems, phthorchynoles, (3rd and 4th generation) or cephalosporins of 4th generation. The good preventive and curative effects have been achieved using the bacteriophage (liquid or immobilized on the biodegradative polymere – "Phagobioderme").

**KEYWORDS:** *maxillo-facial region, trauma, infection, complication*

Recent years it is evidential of increasing the number of complex, severe trauma that is mainly predicted with the road accidents in our country. In the abovementioned cases, coexistence of the head and facial injuries is about 40%. The maxillo-facial traumas are the 30-40% of total trauma rate of clinical departments of maxillo-facial clinics and on the other hand the trauma rate represents the 21% of total body injuries. The rate of infectious complications is about 9-12%.

According to the enough good developed visualization type, the maxillo-facial region is resistant to the infections; on the other hand the oral cavity, also nasopharynx, as a biotype - represent the prevalence place of diverse microbial flora. The anatomical peculiarities of the infection beneath the cervical facial pouches, toward the mediastinum and cranial cavity that predict the life-threatening local or systemic infectious complications.

During the last 2 years (2004-2005), more than 135 patients with traumatic injuries of maxillo-facial region had applied to the Central Clinical Hospital of Tbilisi State Medical University. The basic reasons of trauma were the road accidents. Isolated trauma was in 65 cases, complex in 70 cases. Only soft tissues injuries - 36 cases, fractures of bones - 99 cases. The injury of the upper, middle and lower zones of the facial region were described appropriately in 19, 62 and 44 cases.

The eminent this factors of the soft tissues and bone infections during the maxillo-facial traumas were as follow: local -existence of the motive tooth delayed admittance, uncompleted fixation of the fractured bone parts, the disturbance of the entities of body mechanical barriers, tissue contusion and necroses, the degree of the primary microbial contamination, degree of invasion of curative and diagnostic procedures and penetration to the physiological cavities. General factors were as follow: Chock (60); hypoxemia (25), hypoproteinemia (50), anaemia (53), diabetes mellitus (28); age factor (15) and malnutrition.

The effective preventive measures in these cases were: restoration and the adequate surgical management of the injured region in time, verification and monitoring of the bacterial contamination; early and adequate (empiric)

antibacterial administration and etiotropic antibacterial treatment of suppurative - inflammatory complications.

In order to detect the character of primary microbial contamination has been applied dynamic culture study in 30 cases. The material for investigations were obtained from the wound, opened physiological cavities (oral cavity, naso-pharynx, maxillar cavity) just during the admittance. The susceptibility were defined using the disco-diffusive and serial dilution methods toward the 40 antimicrobial drugs.

According to our data, during the early admittance due to the superficial injuries of soft tissues or non-penetrans (in cavities) wounds (15 cases), the primary identification of the monocultures of Staphylococcus Aureus, Staphylococcus epidermidis and E.coli. In cases of the broken entities of nasal or oral cavities we have isolated also streptococcus. In cases of non-sutured skin, dynamical observation from the 5-8 days showed the transformation of the microbial types that is predicted, we think to the secondary contamination as a nosocomial factor in the surgical and ICU words. The main germs in the above described cases were: Pseudomona aeruginosa, clebsiela, enterococcus and in some cases moraxella and acynetobacterium.

According to our material, the satisfactory results were achieved using the bacteriophages in the point of view of the curative and prophylaxis directions. The liquid forms of the bacteriophages were used for the sanitation of the wounds and cavities. Irrigation of the cranial region, the management of the nasal, pharyngeal region and elaboration of the intubations tube with bacteriophages also represented the effective prevention of nosocomial infection.

The micro flora of the primary contamination was suspected to the cephalosporines II and III; also inhibitoracid semisynthetical penicilines. The intra-hospital strains often were resistant toward the 30-35 antibiotics. In the cases of staphylococcus and enterobacteries, the susceptibility of the microbes toward the adapted strains of bacteriophages completed 70%.

The more attention should be given to the antibacterial remedy of national production - "phagobioderm". Phagobioderm itself represents the 5 component bacteriophage. Immobilized on the biodegrade polymer

substance in association with the antibiotic and the proteolysis enzyme. The abovementioned remedy is keeping its antibacterial activity during the 2-3 weeks in the wound or opened cavity, that predicts so called "accumulation" and permanent reproductive feature in cases of infection existence.

Based on our material, the suppurative-inflammatory complication of the isolated maxillo-facial trauma was reported only in 8 days. All the patients applied to the hospital later, after 24 hour (or more) of the trauma acquaintance. During the severe trauma, especially during the fractures of the facial bones, the infection developed in 16 cases. The suppuration of the soft tissues was liquidated in all cases, without any systemic or regional complications. Osteomyelitis was developed in 8 cases, mainly during the mandibular fractures. In cases of patients' death with severe complex trauma, the suppurative-inflammatory complication was not the direct reason of the death in no cases.

For the detection of efficiency of proposed curative-prophylaxis complex we have introduced the control group in order to compare the results with them. The control group was created with 30 patients those with the similar types of injuries. Presentability of the control group vs. the basic group was similar. Those patients were treated in our hospital during the 2004-2005 years with traditional methods. The volume of the surgical intervention was the same, while the microbial monitoring of the germs, also phagoprophylaxis and phagotherapy was not applied.

The criteria of the treatment efficiency and exitus were as follow: Locally quantity of the suppurative-inflammatory complications of injured tissues; subjective and objective features of suppurative infection flow (quantity of the exudates, its type; frequency of the Para nasal cavities infection; development of traumatic osteomyelites and its perifical reaction during the chronicle transformation; also degree of the systemic inflammatory reaction. The last feature was emphasized while the priority reasons of generalized inflammatory responses were localized in the maxillo-facial region.

Markedly divergent values were obtained during the open, severe isolated and complex injuries, especially when the facial bones were fractured or physiological cavities were opened. During the combination of the etiotropic antibacterial therapy with phagotherapy we have not reported any complication with the severe suppurations of maxillo-facial region. The local cellulites were developed only in 5 cases of wound management in the stage of serotic inflammation. In 3 cases, we were ought to remove the suture due to the wound was revealed in 2 patients. We have not cases of development of facial bone osteomyelitis. The severity of the infection flow and terms of reconvalescence was also different. The liquidation of the local and systemic complications of the inflammations were achieved 3,0 (?0,2) days earlier Vs. control group.

In the control group from the 32 patient with the severe local or complex injuries, suppuration of the sutured wounds took place in 12 cases. In 5 patients, the chronic mandible osteomyelitis had definitely formatted.

#### REFERENCES:

1. Microbiology and management of deep facial infections and Lemierre syndrome; ORL J Otorhinolaryngol Relat Spec 2003 Mar-Apr;65(2):117-20
2. Brook I Georgetown University School of Medicine, Washington, D.C., USA. (ISSN: 0301-1569) ib6@georgetown.edu
3. Безруков В.М., Робустова Т.Г. Руководство по хирургической стоматологии и челюстно-лицевой хирургии. Том 1. Москва «Медицина» 2000. С. 434-480
4. Александров Н.М., Аржанцев П.З., Травмы челюстно-лицевой области, 1986 г. Москва, «Медицина»

## Профилактика и лечение хирургической инфекции при повреждениях челюстно-лицевой области

*Теона Данелия*

Кафедра хирургической стоматологии Тбилисского государственного медицинского университета, Грузия.

### РЕЗЮМЕ

Обследовано 135 пациентов с механическим повреждением челюстно-лицевой области; установлены основные риск-факторы инфицирования поврежденных мягких тканей и костей, в том числе при огнестрельных ранах с некротическими и разможенными тканями, с проникновением в физиологические полости; неадекватной хирургической обработке ран, позднем обращении за медицинской помощью, тяжелых сочетанных повреждениях. Изучена первичная контаминирующая рану микрофлора и характер трансформации возбудителя инфекции. Идентифицированы госпитальные штаммы бактерий, определена их чувствительность к 35 антибиотикам методом серийных разведений. В зависимости от тяжести повреждения, разработан короткий, 3-х дневный курс антибактериальной профилактики цефалоспорином II поколения и полусинтетическими антибиотиками. Установлено, что при тяжелой сочетанной травме методом выбора является дезкваминационная терапия с применением карбопенемов, фторхинолонов III-IV поколения или цефалоспоринов IV поколения. Хороший профилактический и лечебный эффект получен при применении бактериофага в ее жидкой форме или иммобилизованной на биодegradуемом полимере "фагобиодерм".

**Ключевые слова:** *челюстно-лицевая область, травма, инфекция*