

## INCIDENCE OF POSTEXTRACTIONAL DENTAL HEMORRHAGES AND ETIOLOGICAL FACTORS TRIGGERING THEIR OCCURRENCE

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**Abstract:** The study comprised 88 patients who were admitted to the Emergency Hospital within 2007-2009 with complaints of hemorrhage in the oral cavity. Of the total group of patients (88), 73 (82,9±4,4%) had postextractional dental hemorrhages. Analysis of the structure of pathologies which caused occurrence of postextractional dental hemorrhages, has revealed a significant prevalence of general etiological factors (79,5±4,7%) compared with the local ones (20,5±4,7%) ( $p<0,001$ ).

**Key words:** postextractional dental hemorrhages, incidence, etiology.

### INTRODUCTION

Normally, bleeding of the postextractional dental wounds ceases in 15-20 minutes forming a blood clot [1,2]. However there are cases when bleeding does not stop independently, but it continues or occurs after some hours/days from the surgical intervention [3]. Thus, the notion of postextractional dental hemorrhage (PDH) entails hemorrhage that continues or occurs from the alveolus of the extracted tooth, over the physiological terms of blood clot formation. According to the data from the medical literature [4], PDHs occur in 0,25 to 5% of patients, and of all complications of dental extractions, they constitute 15,9%.

PDHs occur due to some local and/or general factors which, either oppose to clot formation or favor its premature lysis [1,2].

**Local factors** triggering PDHs occurrence can be the following [1,2,3,4,5,6]:

- Extended mucous wounds with important impairment of the gingival mucosa;
- Fracture of the alveolar process or maxillary bones;
- Damage of some important vessels (e.g. inferior alveolar artery);
- Secondary (paralytic) vasodilatation, occurring after administration of some vasoconstrictive substances together with anesthetic (adrenalin, noradrenalin);
- Persistence of some chronic pathological inflammatory processes in the alveolus;
- Presence of some bone chips or bone projections, dental remnants in the alveolus, which can cause local irritations;
- Damage of a vessel abnormally positioned intraosseously or in the soft gingival tissues;

- Presence of some abnormalities of the alveolar vessels (aneurysms, angiomas) around the root of the extracted tooth;
- Lysis of the blood clot and thrombi from the capillaries in/within alveolitis, when fibrinolytic activity enhances essentially in the alveolus;
- Failure of the patient to follow indications regarding the postextractional care (abundant mouth washing, consumption of hot food, “sucking” the alveolus etc.), which can cause lysis of the intraalveolar clot followed by hemorrhages.

**General factors** involved in PDHs occurrence are considered the following [3,4,5,6]:

- Hereditary deficit of one of the coagulation factors (hemophilia, von Willebrand disease, pseudohemophilic affections – hypofibrinogenemias, hypoprothrombinemias, hypoproconvertinemias etc.);
- Affection of the vascular wall in hereditary hemorrhagic telangiectasia, hemorrhagic vasculitis, avitaminosis of vitamins C and PP, systemic lupus erythematosus, in some infectious diseases – typhoid fever, exanthematous typhus, scarlatina etc.);
- Functional and/or quantitative insufficiency of thrombocytes in thrombocytopenic purpura, leukemias etc.;
- Arterial hypertension (AHT);
- Patients under antithrombotic medication (acetylsalicylic acid, acenocoumarol, warfarin, heparin etc.);
- Chronic liver diseases (liver cirrhosis, infectious hepatitis);
- Pathologies of the endocrine system.

Though it is obvious that there are multiple local and/or general factors triggering PDHs occurrence, the contemporary views concerning the most frequent causes of PDH are quite contradictory. Thus, a lot of authors are unanimous about the fact that local factors have the most frequent role in PDHs occurrence, while the general ones have a less frequent role [3,4,5]. However, in the last years, a particular interest is observed in the literature of specialty, regarding the study of the general factors which trigger PDH occurrence [7,8,9,10,11,12,13]. This fact is explained by increase of number of patients with concurrent diseases with an impact on hemostasis [14], increased consumption of antithrombotic remedies for treatment and prophylaxis of degenerative and cardiovascular diseases, prophylaxis of thromboembolic accidents etc. [15,16]. Within this context, information concerning health both on international level and in the Republic of Moldova proves that we are now at the beginning of millennium, far from solving any great health problems.

Cardiovascular diseases are among those problems which are considered to be a real devastating damage in the majority of countries worldwide [17]. Despite the great achievements obtained in prevention of cases of morbidity, incidence of chronic hepatitis and liver cirrhosis of viral origin is rising annually [18]. In the last 10 years indications for treatment with oral anticoagulants have extended [19]. Millions of patients are under medication that influences hemostasis, reducing the

risk of occurrence of thromboembolic events [20].

Thus, the great multitude of etiological factors triggering PDH occurrence, rise of incidence of general pathologies which can influence hemostasis, as well as the number of persons under antithrombotic medication, have determined us to carry out studies of the causative factors.

### PURPOSE OF STUDY

To assess the incidence of posextractional dental hemorrhages and etiological factors which trigger their occurrence.

### MATERIALS AND METHODS

The study was based on analysis of the obtained results in a group of 88 patients, examined and treated in the Department of Oro-maxillo-facial Surgery within the National Scientific Practical Center of Emergency Medicine (NSPAEM) from Chisinau within 2007-2009. These patients were admitted for rendering the emergent medical assistance. The patients complained of hemorrhage in the oral cavity. Male patients (48) constituted 54,5±4,6%, while women (40) – 45,5±4,7%. Mean age was 50,7± 2,7 years.

Clinical examination was carried out according to traditional methods of patients examination. Then, it was urgently determined hemoleucogram assessing the hematocrit. The routine parameters of general and biochemical blood analysis (assessing the thrombocyte count in the peripheric blood), urine analysis, indices of coagulogram (index of prothrombin,

content of fibrinogen, time of partially activated thromboplastin, thrombinic time, test with ethanol) have been subsequently examined. The effect of oral anticoagulants was assessed through monitoring the prothrombin time, represented by the international coefficient of normalization called *International Normalized Ratio* (INR). In addition to this, patients included in the study were subjected to panoramic and retroalveolar radiography, but if it was necessary (patients over 40 years old suffering from cardiovascular diseases et.) - electrocardiography. To perform an orientational examination of the hemostatic system it was determined the bleeding time by Duke and coagulation time by Lee-White.

Medical examinations performed by the general prophile practitioners (therapeutist, hemapathologist, cardiologist,) were required (by indications), to reveal the concurrent pathologies and to establish as judicious as possible general therapeutic conduct .

Analysis of the obtained data was carried out using the programs Statistics 6.0 (Statsoft Inc), EXCEL and SPSS 16.0 (SPSS Inc) by means of functions and modules of these programs. Statistical processing has allowed us to calculate the rates, mean values, proportional indices.

### RESULTS AND DISCUSSIONS

The hemorrhagic syndrome was revealed more frequently in men aged between 50-59 (14,8%) years old, being followed by male patients aged 60-69 (13,6%), ≥ 70 (10,2%), 40-49 (6,8%), ≤ 29 (5,7%) and 30-39 (3,4%)years old; and

women - 50-59 (11,4%),  $\geq 70$  (11,4%), 60-69 (10,2%), 40-49 (6,8%),  $\leq 29$  (3,4%)

Mean time from the moment of bleeding occurrence up to admission to NSPAEM was  $17,1 \pm 2,1$  hours, with a minimal value of 0,5 hours and maximal one – 96 hours. It is to be mentioned that the majority of patients (55 patients or  $62,5 \pm 5,2\%$ ) were admitted in the first 12 hours from the onset of hemorrhage. Of these patients, 16 ( $29,1 \pm 6,1\%$ ) patients sought medical assistance in the first 6 hours. 14 ( $15,9 \pm 3,9\%$ ) patients were hospitalized within 12-24 hours from the onset of hemorrhage, 11 ( $12,5 \pm 3,5\%$ ) patients – within 24-48 hours, and 5 ( $5,7 \pm 2,5\%$ ) patients within the interval of time from 48 up to 72 hours. Only 3 ( $3,4 \pm 1,9\%$ ) patients have been hospitalized later than 72 hours from the moment of hemorrhage occurrence. It is necessary to mention that the main reasons of late seeking of medical assistance by the patients were both patients attempts to stop the hemorrhage independently (through application of compressive supraalveolar tamponade) as well as patient's repeated visit of the

and 30-39 (2,3%) years.

surgeon who performed the surgical intervention.

49 ( $55,7 \pm 5,3\%$ ) patients have been carried to the emergency hospital with the ambulance, but 39 ( $44,3 \pm 5,7\%$ ) patients have sought medical assistance attending independently the doctor. The majority of patients - 40 ( $45,4 \pm 5,3\%$ ), came between  $18^{00}-24^{00}$ , being followed by 18 patients who came between  $12^{00}-18^{00}$  ( $20,5 \pm 4,5\%$ ) and  $24^{00}-6^{00}$  ( $20,5 \pm 4,5\%$ ). Between  $6^{00}-12^{00}$  medical assistance was sought by 12 ( $13,6 \pm 3,7\%$ ) patients.

Of those 88 patients who complained of presence of hemorrhage from the oral cavity, 73 ( $82,9 \pm 4,4\%$ ) had postextractional dental hemorrhage, 8 ( $9,1 \pm 3,4\%$ ) had gingival hemorrhage and 7 ( $8,0 \pm 3,2\%$ ) patients had hemorrhage after periosteotomy. Causes of hemorrhage occurrence in these patients were the following (in descending order): in 34 ( $38,6 \pm 5,2\%$ ) cases – arterial hypertension, in 27 ( $30,7 \pm 4,9\%$ ) – thrombocytopenia, in 15 ( $17,1 \pm 4,0\%$ ) – local factors and in 12 ( $13,6 \pm 3,7\%$ ) patients – antithrombotic medication. Data are shown in Figure 1.

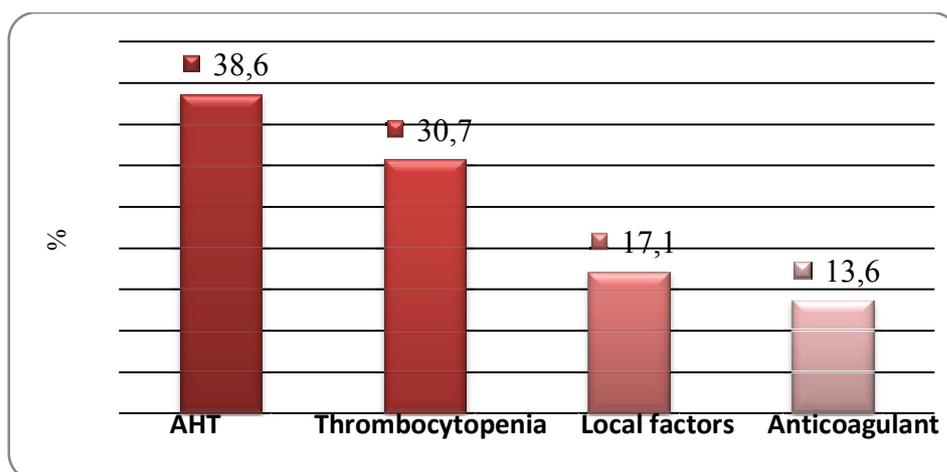


Fig. 1. Incidence of etiological factors in the hemorrhagic syndrome (%)

Analysis of structure of pathologies which triggered hemorrhage occurrence in patients from the examined group, has highlighted a significant prevalence of the general etiological factors (82,9±4,0%).

The major practical importance of the study was to determine the incidence of the etiological factors that trigger PDHs occurrence. Thus, in 73 patients with PDH,

where considered the following causes of hemorrhage occurrence ( in descending order): in 28 (38,4±5,7%) cases – arterial hypertension, in 22 (30,1± 5,4%) – thrombocytopenia, in 15 (20,5±4,7%) – local factors and in 8 (10,9±3,6%) patients – antithrombotic medication. Data are shown in Figure 3.

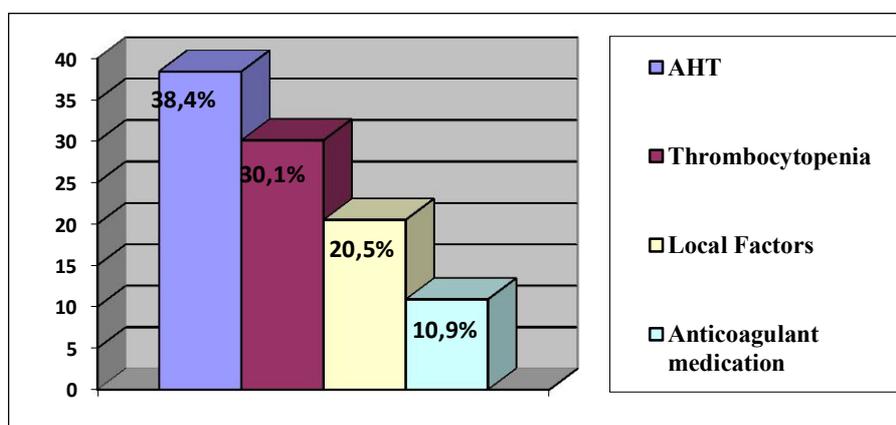


Fig.2. Incidence of the etiological factors of postextractional dental hemorrhage (%)

Among the local factors involved in occurrence of PDH (in 15 cases or 20,5±4,7% ), in 10 (66,7%) patients presence of traumatic extractions was revealed. Traumatic extractions were accompanied by fracture of the alveolar

apophysis and important impairment of the gum mucosa. It is to be mentioned that in 4 (26,7%) patients, the cause of PDH was considered to be lysis of the blood clot and of the thrombi from the capillaries within alveolitis, when the fibrinolytic

activity within the alveolus increased essentially [4]. After having inspected the postextractional dental wound in these patients, it was revealed presence of the endoalveolar clot covered with purulent deposits, fetidly smelling and presence of the capillary bleeding. Secondary vasodilatation (paralytic) occurring after having administered adrenalin, together with the anesthetic, followed by occurrence of PDH, was considered in one (6,7%) patient.

Analysis of structure of pathologies which have triggered PDHs occurrence, has highlighted a significant prevalence of the general etiological factors. The total rate constituted  $79,5 \pm 4,7\%$  ( $p < 0,001$ ), which exceeds the appropriate indices met in the literature of specialty and it constitutes nearly 20-30% [4,5,21]. Perhaps this phenomenon can be explained by a series of factors. Firstly, it can be explained by the fact that only the patients who sought medical assistance at NSPAEM were included in the study. Moreover, significant prevalence of the general etiological factors over the local ones in the study can reflect also the rise of number of persons with concurrent

diseases having an impact on hemostasis, increased consumption of antithrombotic remedies for the treatment and prophylaxis of thromboembolic accidents [16,19]. On the other hand, reduction of the number of patients hospitalized with hemorrhages caused by the local factors can be explained by curative procedures rendered to these patients in conditions of out-hospital department (clinic).

## CONCLUSIONS

1. Incidence of postextractional dental hemorrhages constitutes  $82,9 \pm 4,4\%$  from the total number of patients who presented with complaints of hemorrhagic syndrome.
2. Analysis of structure of pathologies which triggered postextractional dental hemorrhage occurrence in patients from the examined group, has highlighted a significant prevalence of the general etiological factors ( $79,5 \pm 4,7\%$ ) compared with the local ones ( $20,5 \pm 4,7\%$ ) ( $p < 0,001$ ).
3. Hemorrhagic accidents can be reduced to minimum through a correct preoperative assessment and by respecting the basic surgical principles, avoiding rough manipulations as well as traumatizing the tissues.

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