

## ENSURING OF HAEMOSTASIS IN PATIENTS WITH POSTEXTRACTIONAL DENTAL HEMORRHAGES

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**Abstract:** This work has focused on assessing the efficacy of the local haemostatic treatment through application of sutures in 42 patients with postextractional dental hemorrhage caused by local factors, arterial hypertension, thrombocytopenia and oral anticoagulant medication. According to the obtained data, application of sutures in patients with postextractional dental hemorrhages occurring due to thrombocytopenia and oral anticoagulant medication is associated with a considerable increase of the rate of hemorrhage recurrences. At the same time it has been established that application of sutures has a positive influence on the results of treatment in patients with hemorrhages caused by arterial hypertension and local factors. Consequently, the doctor will choose the proper method of treatment relying on the anamnesis or clinical data which will direct him toward the etiological factor which has been involved in the occurrence of hemorrhage.

**Key words:** postextractional dental hemorrhage, application of sutures, haemostasis.

### INTRODUCTION

Compressive gauze applications, diathermocoagulation of the bleeding tissues, application of sutures, chemical agents or hemostatic substances are used to render medical assistance to patients with postextractional dental hemorrhages (PDH) [2,7,11,13,14,15]. Despite the existence of a great number of methods which secure local hemostasis, application of sutures represents a standard approach and one of the most widely spread procedures used in patients with PDH. According to data from medical literature, some authors [2,11,14] mention the fact that sufficient hemostasis can be obtained through application of sutures. C.G. Stelea et al. (2008) [7] recommend application of sutures if the breadth of the alveolar edge is not too big, while the margins of the gingival mucosa can be approached over the alveolus. Besides approaching the edges of the gingival mucosa, approaching edges of the flaps to the bleeding mucosa ensures a better protection of the clot.

However, in the last years use of the sutures with hemostatic purposes continues to be the subject of multiple scientific debates[1,8]. This fact is on the one hand due to the difficulties which sometimes occur in performing the local hemostasis, on the other hand the operative traumatism which inevitably occurs when applying the method. Consequently some studies mention that sutures application does not always secure a sufficient hemostasis. Thus, S. Al-Mubarak et al. (2007) [1], C.Walker (2008) [8] have drawn a conclusion that the decision either to apply sutures or not should be taken depending on each case particularly, because the additional trauma of the soft tissues can outweigh the benefit in some cases such as simple extractions in patients under oral anticoagulant medication.

It is necessary to remark that so far in the medical literature, it has been overlooked and insufficiently reflected the analysis of the sutures efficacy depending on the etiological factor of the hemorrhage. Thus, it is necessary to

perform a subsequent study concerning the efficacy of sutures application to ensure local hemostasis in patients with PDH of diverse etiology.

### PURPOSE OF STUDY

Assessment of efficacy of the local hemostatic treatment through application of sutures in patients with postextractoral dental hemorrhages of diverse etiology.

### MATERIAL AND METHOD

The study was based on analysis of the obtained results in a group of 42 patients with PDH of diverse etiology. The patients have been examined and treated in the Department of Oro-maxillo-facial Surgery at the National Scientific Practical Center of Emergency Medicine (NSPCEM) from Chisinau, within 2007-2009. Male patients (26) constituted 61, 9%, women (16) - 38, 1%. The mean age constituted  $50,7 \pm 2,7$  years (from 18 to 77 years).

Clinical examination was carried out according to the traditional methods of examination of the patients. The laboratory examinations were performed in collaboration with the clinical diagnostical laboratory of NSPCEM. The routine parameters have been examined such as indices of general and biochemical blood analysis (assessing the thrombocytes count of the peripheral blood), urine,

coagulogram indices (prothrombin index, fibrinogen content, time of the partially activated thromboplastin (TPAT), thrombinic time, test with ethanol). The effect of the oral anticoagulants was assessed at admission and at follow-up, through monitoring of the prothrombinic time represented by the *International Normalized Ratio* (INR) [12]. The patients included in the study were subjected to panoramic and retroalveolar radiography, but when needed (patients over 40 years old suffering from cardiovascular diseases, etc.) – electrocardiography. To perform a preliminary examination of the hemostatic system, the examined patients were determined the bleeding time by Duke and clotting time by Lee-White. Medical examinations performed by the general prophile practitioners (therapeutist, cardiologist, hemapathologist) were required (by indications), to reveal the concurrent pathologies and to establish as judicious as possible general therapeutic conduct.

To ensure the local hemostasis, the sutures with nonresorbable thread have been used. With this purpose, the „X”-shaped suture was applied (Fig. 1), the needle being introduced at a distance of about 5 mm from the gum margin, then followed by the supraalveolar application and slight compressive gauze application.



Figure 1. Application of „X”-shaped suture

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

Causes of occurrence of hemorrhage in those 42 patients included in the current study were the following: in 15 ( $35,7 \pm 7,4\%$ ) cases – local factors, in 13 ( $31,0 \pm 7,1\%$ ) – arterial hypertension (AHT), in 10 ( $23,8 \pm 6,6\%$ ) – thrombocytopenia and in 4 ( $9,5 \pm 4,5\%$ ) – oral anticoagulant medication (Fig. 2).

Among the local factors involved in occurrence of PDH (in 15 cases), 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 [15]. 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 adrenaline, together with the anesthetic, followed by occurrence of PDH, was considered in one (6,7%) patient.

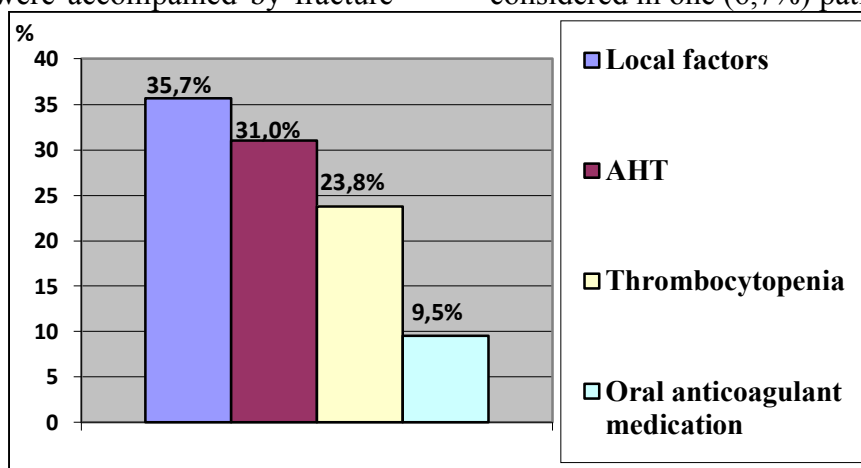


Figure 2. Incidence of etiological factors of the postextractional dental hemorrhages controlled through application of sutures (%)

Of those 42 patients who were applied sutures, hemorrhagic recurrences have been recorded in 8 ( $19,0 \pm 6,1\%$ ,  $p < 0,05$ ) patients, during the in patient stay ( $4,3 \pm 0,2$  days). It is important to mention that hemorrhage recurrence (HR) was considered to be the development of a repeated bleeding at a period of time from the hospital admission up to the patient's discharge out of the in-patient department. HR was diagnosed on the basis of the newly occurring signs of bleeding – blood tinged saliva, occurrence of the „fresh” blood in the oral cavity.

Clinical and paraclinical analysis of those 8 patients with HR after application

of sutures revealed that 6 (75,0%) of them had thrombocytopenia, while 2 (25,0%) patients had been under oral anticoagulant medication (warfarin, thrombostop). Chronic liver pathologies (chronic viral hepatitis B, chronic viral hepatitis C, and liver cirrhosis) were considered to be the causes of thrombocytopenia in these patients.

Assessment of the hemostatic system of the patients with PDH, primarily subjected to the local treatment through application of sutures, has established presence of marked disturbances in the primary and secondary hemostasis in patients with HR. Mean values of the basic

indices of the hemostatic system and mean values of the bleeding time by Duke,

clotting time by Lee-White are shown in Tabel 1.

Tabel 1. Indices of the hemostasis and mean values of the bleeding time by Duke, clotting time by Lee-White in patients with PDH subjected primarily to the local treatment through the application of sutures (n=42)

Studied indices	Group of patients without HR (n=34)	Group of patients with RH (n=8)	t	P
Prothrombin (%)	91,6 ± 1,6	80,8 ± 9,5	1,13	*
Fibrinogen(g/l)	3,0 ± 0,1	2,7 ± 0,2	1,5	*
TPAT (sec.)	34,8 ± 1,1	35,4 ± 2,0	0,26	*
Thrombinic time (sec.)	27,4 ± 0,9	25,4 ± 1,1	1,41	*
Test with ethanol (sec.)	negative	negative	-	-
Count of thrombocytes (x 10 <sup>9</sup> /l)	225,2 ± 16,7	114,6 ± 26,5	3,53	***
Bleeding time by Duke (min.)	2,6 ± 0,2	4,4 ± 0,7	2,57	**
Clotting time by Lee-White (min.)	8,6 ± 0,3	9,4 ± 0,9	0,89	*

\* p>0,05 \*\* p<0,05 \*\*\* p<0,01

Having analysed the indices of the primary and secondary hemostasis in patients with and without HR after application of sutures, it is observed that in patients with HR, mean values of the prothrombinic index and thrombocytes count have deviated from the normal limits. Thus, the mean value of the prothrombinic index in these 8 patients was equal to 80,8 ± 9,5%. This indicates a disturbance of the secondary (plasmatic) hemostasis. This fact is due to both chronic liver disease present in 6 (75,0%) patients (because the very hepatocyte is the site of synthesis of the majority of factors of coagulation, including prothrombin) and to the oral anticoagulant medication in 2 (25,0%) cases, which inhibits formation of prothrombin in the body. In case of primary hemostasis it was determined a statistical difference of the mean values of the thrombocytes (114,6±26,5 x 10<sup>9</sup>/l) in patients with HR compared with patients without HR

(225,2±16,7 x 10<sup>9</sup>/l). Moreover, a marked alteration of the primary hemostasis in patients with HR, initially was suspected through increase of the bleeding time, mean values of this test being equal to 4,4±0,7 minutes compared with 2,6±0,2 minutes in patients without HR (p<0,05).

Of those 8 patients with HR after application of sutures, in 7 (87,5%) cases hemorrhage was controlled through the local application of the human thrombin and 5% aminocaproic acid. It is necessary to mention that at the initial stage of the study, due to lack of the human thrombin, in one (12,5%) patient with HR the repeated application of sutures was ineffective, hemorrhage continued, and consequently, the patient was transferred to the Intensive Care Unit to be subjected to an intensive drugs-based treatment. Thus, after the repeated application of sutures, we have appreciated that this attempt to stop the hemorrhage caused an additional trauma of the tissues, this inevitably

contributing to the increase of the vascular defect and consequently to intensification of hemorrhage.

Thus, the presented data prove convincingly that application of sutures in patients with PDH occurring due to thrombocytopenia and oral anticoagulants is associated with a considerable increase of HR rate. Though there are great debates in the literature of specialty concerning the securing of postextractional dental hemostasis in patients under antithrombotic medication either cancelling or not these remedies [3,4,5,6], our studies [10] demonstrated high efficacy of the human thrombin and 5% aminocaproic acid in this category of patients, maintaining INR within the individual therapeutic range limits recommended by the general prothrombotic practitioner.

At the same time it was stated that application of sutures has a positive influence on the results of treatment in patients with PDH caused by AHT and local factors. It is necessary to mention the fact that the treatment management in patients with PDH with underlying hypertension requires a special approach regarding general antihypertensive measures (performed in cooperation with the therapist).

Presence of both advantages and drawbacks is characteristic for some methods used in PDH apart from hemostasis. Analysis of peculiarities of one or another method allows specification of the indication for its use in a concrete clinical situation, taking into consideration the etiological factor involved in occurrence of PDH. Thus, we recommend

application of sutures in patients with PDH with underlying AHT. Taking into consideration the advantages of the hemostatic method with human thrombin and 5% aminocaproic acid (it is minimally invasive which permits blood clot formation, thus favoring healing of the postextractional dental wound; the technique of performing this procedure is simple; short period of time needed for procedure etc.) [9], we propose use of this method in patients with PDH associated with the drugs administration (anticoagulants) and in patients with chronic liver diseases, which cause disturbances in the primary and/or secondary hemostasis. At the same time, it is necessary to mention that treatment of patients with PDH occurring on a general basis requires a multidisciplinary attitude, its success depending on a reciprocal coordination of the dentist's, therapist's and/or hematologist's actions.

## **CONCLUSIONS**

1. The routine use of sutures to ensure local hemostasis in patients with PDH occurring on the general thrombocytopenic and antithrombotic basis correlates with a considerable increase of the number of hemorrhagic recurrences.
2. Application of sutures has a positive influence on the treatment results in patients with PDH caused by AHT and local factors.
3. Choice of the method of treatment will be done depending on the anamnestic and clinical data which directs the practitioner towards the etiological factor triggering the PDH occurrence.

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