



Retrospective study on hospitalized patients with epistaxis: Insights and implications

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Abstract

Epistaxis, commonly encountered in the Otolaryngology practice, refers to bleeding that occurs as a result of vascular pathologies and coagulation disorders. It can develop due to traumatic, iatrogenic, or spontaneous etiologies. In our study, we aim to retrospectively examine the epistaxis patients treated in our clinic to investigate the etiology causing epistaxis, associated diseases, and the use of anticoagulants-antiplatelets. Additionally, we plan to evaluate hemogram and coagulation parameters. The study included patients diagnosed with epistaxis and admitted for treatment at Samsun Education and Research Hospital ENT Clinic between 2019 and 2022. A retrospective analysis of the patients' medical records was conducted to gather data on demographic characteristics, comorbidities, medications used regularly, laboratory values, and clinical findings. A total of 130 patients were included in the study. No statistically significant difference was observed between the location of the bleeding focus and gender, presence of hypertension, use of antihypertensive medication, or anticoagulant use. When comparing patients with and without antiplatelet-anticoagulant use, a significantly longer nasal packing duration was found in patients who used these medications. In terms of the need for electrocauterization, statistically significant higher intervention rates were observed in patients who did not use anticoagulant medication. Our study identified a higher rate of surgical intervention in hospitalized epistaxis patients, potentially due to the inclusion of more severe cases requiring specialized care. Further research is needed to investigate the factors influencing the need for surgical management and to develop appropriate guidelines for the management of different severities of epistaxis.

Keywords: epistaxis, anticoagulant drug, nasal packing, electrocauterization

1. Introduction

Epistaxis, which can occur in the nasal cavity, paranasal sinuses, and nasopharynx, is characterized by bleeding resulting from mucosal damage, vascular pathologies, and coagulation disorders (1,2). It is one of the most commonly encountered emergencies in Otolaryngology practice. Although the exact prevalence is unknown, it is estimated to be around 60% in the general population throughout their lifetime, with approximately 10% of these cases requiring medical or surgical intervention (3). The incidence of epistaxis increases with age and is more commonly observed in males than females (1,4). The highest incidence is seen in the age group of 50-60 years (3,4).

The etiology of epistaxis can be traumatic (nasal fractures, nasal intubation, cocaine use, nasal foreign bodies, etc.), iatrogenic (following nasal and sinus surgeries), or spontaneous (5). Spontaneous epistaxis often occurs due to local factors such as dry air, infectious and allergic rhinitis, or due to systemic factors such as anticoagulant and antiplatelet medication use, hypertension, coagulation and platelet abnormalities, hereditary conditions (Osler-Weber-Rendu disease), and alcoholism(5).

Epistaxis can often resolve on its own or be controlled with conservative methods (4). The treatment of epistaxis begins with identifying the bleeding focus. Epistaxis is classified

based on whether the bleeding focus is anterior or posterior (1,3). The bleeding can be diffuse or localized. In cases of localized epistaxis, the bleeding can be controlled by chemical or electrocauterization methods at the bleeding focus. If bleeding cannot be controlled or the bleeding focus cannot be identified, anterior or posterior nasal packing can be applied depending on the location of the bleeding (1,4). Epistaxis can be aggressive enough to require interventions such as repeated blood transfusions, arterial embolization, or surgical methods to control the bleeding (6).

Our study aims to retrospectively analyze the epistaxis patients treated in our clinic as inpatients to investigate the etiology of epistaxis, associated diseases, and the use of anticoagulant-antiplatelet medications. We also plan to evaluate the hemogram-coagulation parameters. Additionally, we will conduct a detailed assessment of the medications used by the patients and evaluate whether there are any differences in the severity of bleeding and response to treatment based on the use of anticoagulant-antiplatelet medications.

2. Materials and Methods

The research protocol, with the approval number SÜKAEK-2022/8/6, was obtained from the Ethics Committee of our hospital. The data of all patients aged 18 and over who were diagnosed with epistaxis and treated as inpatients at the

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Department of Otolaryngology of Samsun Education and Research Hospital between 2019 and 2022 were obtained retrospectively from the hospital automation system and archival files, ensuring that there were no missing records. The collected data included age, gender, previous systemic diseases, new systemic diseases diagnosed during this admission, use of antiplatelet and anticoagulant medications, active ingredients of the medications used, hemogram and coagulation parameters, methods applied to stop the bleeding (packing, cauterization), location of the bleeding focus, and duration of hospitalization.

IBM SPSS Statistics Version 21.0 software for Windows (Armonk, NY) was used to analyze outputs. The Kolmogorov-Smirnov test was performed to test the normal distribution of data. The Mann-Whitney U test (for two groups) and the Kruskal-Wallis H or one-way ANOVA tests (more than two groups) were used to compare groups. For categorical variables, the Chi-square test was performed. Statistical significance was defined as $p < 0.05$.

3. Results

The study included 130 patients, of whom 76 were male (58.5%) and 54 were female (41.5%). Their ages ranged from 19 to 93 years (mean: 58.4 ± 17.8). The duration of hospitalization for the patients was 3.34 ± 1.6 (min: 1; max: 9)

Table 1. Bleeding Parameters and nasal packing duration in patients with and without antiplatelet-anticoagulant use

	Antiplatelet-Anticoagulant non-use(n=66) (mean ± SD)	New generation drugs-NOACs use(n=12) (mean ± SD)	Old generation drugs use(n=48) (mean ± SD)	p-value
Platelet (cells/mL)	258878 ± 77702	199833 ± 68568	245083 ± 75976	0.05 *0.04
INR	1.02 ± 0.1	1.44 ± 0.5	1.17 ± 0.4	<0.01 *<0.01
Nasal packing duration (day) (mean ± SD)	1.7 ± 0.9	2.08 ± 0.2	2.17 ± 0.4	0.03 *0.01

*Antiplatelet-anticoagulant non-use - New generation antiplatelet-anticoagulant use

When comparing the requirement for electrocauterization between patients with and without antiplatelet-anticoagulant

days.

Out of the patients, 77 (59.2%) were diagnosed with hypertension, and 71 (92%) were using antihypertensive medications. Sixty-four patients (49.2%) were receiving anticoagulant therapy due to coronary artery disease. Among the patients receiving anticoagulation, 35 (26.9%) were using acetylsalicylic acid (ASA), 11 (8.5%) were using factor Xa inhibitors, 8 (6.2%) were using warfarin, 4 (3.1%) were using thrombin receptor inhibitors, 1 (0.8%) was using direct thrombin inhibitor, 1 (0.8%) was using low molecular weight heparin (enoxaparin), and 4 (3.1%) were using a combination of antiplatelet and anticoagulant drugs. Sixty-six patients (50.8%) were not using any anticoagulant medication. When comparing bleeding parameters and nasal packing durations between patients using the new generation drugs-NOACs (direct thrombin inhibitor, thrombin receptor antagonist, factor Xa inhibitor, and antiplatelet-ticagrelor) and the old generation drugs (ASA, warfarin, low molecular weight heparin), as well as patients not using any antiplatelet or anticoagulant drugs, significant differences were observed in platelet and INR values in favor of the new generation drug users. Additionally, patients using these medications exhibited significantly longer nasal packing durations. (Table 1).

use, it was found that non-users of these medications required statistically significantly more interventions. (Table 2).

Table 2. Requirement for electrocauterization in patients with and without antiplatelet-anticoagulant use

		Antiplatelet-Anticoagulant non-use(n=66) (mean ± SD)	New generation drugs-NOACs use(n=12) (mean ± SD)	Old generation drugs use(n=48) (mean ± SD)	p-value
Bipolar electrocauterization n (%)	yes	15 (22.7%)	3 (25%)	2 (4%)	0.018
	no	51 (77%)	9 (75%)	46 (96%)	*0.02

*Antiplatelet-anticoagulant non-use - Old generation antiplatelet-anticoagulant use

In 102 patients (78.5%), the bleeding focus could not be identified during hospitalization, while in 19 patients (14.6%), it was located in the anterior region, and in 9 patients (6.9%), it was located in the posterior region. There was no statistically significant difference between the location of the bleeding focus and gender, presence of hypertension, use of antihypertensive drugs, and anticoagulant use ($p: 0.27$, $p: 0.44$,

$p: 0.31$, $p: 0.69$, respectively). Among 110 patients (84.6%), bleeding was controlled conservatively during follow-up, while in 20 patients (15.4%), bipolar electrocauterization was performed endoscopically in the operating room to achieve bleeding control. There was no statistically significant difference between the need for surgery and the location of bleeding ($p: 0.20$). Similarly, no statistically significant

difference was found between the need for surgery and the use of anticoagulants ($p=0.21$). A total of 115 patients (88.5%) were followed with anterior nasal packing during their hospital stay. No packing was applied in 15 patients (11.5%). The mean duration of packing removal was 2.1 days. Among the patients with packing, 92 (70.8%) had their packing removed on the second day, three patients (2.3%) on the first day, 19 patients (14.6%) on the third day, and one patient (0.8%) on the fourth day. There was no statistically significant difference between the packing duration and the bleeding location ($p=0.54$). Similarly, no statistically significant difference was found between the duration of packing and the anticoagulant groups ($p=0.48$).

During the hospitalization of patients with epistaxis, their hemoglobin levels were measured to be 12.5 ± 2.4 g/dL (min: 7.2, max: 18.8). Platelet counts were found to be in the range of 96,000 to 538,000 cells/mL (mean: $248,261 \pm 76,531$ cells/mL). INR values ranged from 0.83 to 3.16 (mean: 1.11 ± 0.34).

4. Discussion

Epistaxis is one of the most commonly encountered emergencies in otolaryngology clinics, and it can be associated with morbidity and rarely mortality. It is often self-limiting or controlled with conservative methods. Epistaxis is a symptom and can occur due to traumatic, iatrogenic, or spontaneous causes(3,5). In the literature, cardiovascular diseases and hypertension are among the leading systemic causes, but a direct relationship has not been established(1,3). In our study, 59.2% of the patients had a pre-existing diagnosis of hypertension before hospital admission for epistaxis, and 92% were receiving antihypertensive treatment.

ASA and clopidogrel are antiplatelet drugs with antithrombotic effects that prevent platelet aggregation during primary hemostasis. Among anticoagulant drugs, new oral anticoagulants(NOACs) have advantageous use and oral administration and do not require close monitoring of dosages. The most commonly used drugs are direct-acting factor Xa inhibitors (rivaroxaban, apixaban), direct thrombin inhibitors (dabigatran), and thrombin receptor antagonists. The risk of epistaxis associated with these drugs is lower than warfarin, another anticoagulant drug, and is generally dose-dependent(7,8). 49.2% of our patients were using anticoagulant-antiplatelet drugs, with 26.9% using ASA, which was the most commonly used drug among the 64 patients who were using anticoagulant-antiplatelet drugs out of the 130 patients included in the study. In our study, significantly longer nasal packing duration was observed in the group using these drugs when comparing patients with and without antiplatelet-anticoagulant use in terms of the need for electrocauterization. In terms of the need for electrocauterization, it was found that patients not using the drugs required significantly more interventions. These findings suggest that patients using antiplatelet-anticoagulant drugs

may benefit from longer follow-up with nasal packing by temporarily discontinuing their medication, while in patients not using antiplatelet drugs, early consideration of electrocauterization may be warranted if bleeding continues despite nasal packing.

Epistaxis is more commonly seen in older people and males (1). A study conducted by Pollice et al. involving 249 patients found that 70% of epistaxis patients were 50 years and older (9). In a study by André et al. involving 205 patients, it was observed that bleeding was more common in males, and the average age of patients presenting with non-severe epistaxis was 67 (6). Consistent with the literature, our study also found a male-to-female ratio of 1.4 and an average age of 58.38.

Epistaxis can be divided into two groups based on its localization: anterior and posterior epistaxis. According to studies in the literature, approximately 90-95% of nosebleeds occur in the anterior region. The anterior region includes the front part of the nasal septum, known as the Little area, where the branches of the internal and external carotid arteries anastomose at the Kiesselbach plexus. This area is susceptible to trauma and can easily be exposed to hot and cold temperatures. It is also a low-humidity area (10). In our study, a single bleeding focus could not be identified upon admission in 78.5% of patients, while 14.6% had an anterior bleeding focus and 6.9% had a posterior bleeding focus. This could stem from the bleeding focus not being visible due to intense bleeding, patients arriving with pre-inserted packing, or the inability to assess the bleeding focus accurately after packing removal due to widespread mucosal damage.

Epistaxis is commonly managed with conservative treatment. After identifying the bleeding focus, chemical cauterization with silver nitrate or electrocauterization methods can be used. In active bleeding that cannot be controlled with pressure, nasal packing techniques can also be employed. Nasal packing should typically be left in the nasal passage for an average of 48 hours (11). In our study, nasal packing was applied to 115 patients (88.5%). The nasal pack was removed in an average of 2.1 days. If bleeding control cannot be achieved in epistaxis cases, various interventions can be performed under surgical conditions, including bipolar cautery of the sphenopalatine arteries, arterial embolization, ligation of the sphenopalatine artery, maxillary artery ligation, and external carotid artery ligation (1,11). Although the literature reports lower rates of bipolar cautery, our study achieved bleeding control in 20 patients (15.4%) using bipolar cautery with endoscopic electrocauterization in the operating room. However, no patient required ligation of the sphenopalatine, maxillary, or external carotid artery due to bleeding. This may be attributed to the fact that our hospital is a tertiary referral center, and patients with severe uncontrolled epistaxis were referred to us for treatment or included in the study after being admitted for treatment in our outpatient ENT clinic due to unsuccessful conservative management.

Based on our study, we evaluated the clinical characteristics and treatment approaches of patients admitted to our clinic due to epistaxis. Our findings were consistent with the literature, indicating that patients were mostly in the older age group and predominantly male. Conservative treatment methods were effective in the majority of epistaxis cases. However, surgical intervention may be required in some cases. We also examined the impact of anticoagulant and antiplatelet medication use on epistaxis. It was found that the new-generation anticoagulants did not pose a significantly higher risk of severe bleeding compared to other anticoagulant drugs.

In conclusion, epistaxis can generally be managed with conservative measures. However, surgical intervention may be necessary in more severe cases. The use of new anticoagulant medications is safer in terms of the risk of epistaxis compared to other drugs. These findings provide valuable insights for properly evaluating and selecting appropriate treatment modalities for patients with epistaxis.

Conflict of interest

The authors declared no conflict of interest.

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None to declare.

Authors' contributions

Concept: A.Ü., A.Ç. Design: H.A., Data Collection or Processing: A.Ü., H.A. S.N.C., Analysis or Interpretation: A.Ü., A.Ç., Literature Search: A.Ü., A.Ç., Writing: A.Ü., H.A. S.N.C, A.Ç.

Ethical Statement

Approval was obtained from Samsun University Clinical Research Ethics Committee, the study started. The ethics committee decision date is 21/09/2022 and the number of

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