

## Epistaxis in geriatric patients

Alper YÜKSEL\*, Hanifi KURTARAN, Ekrem Said KANKILIÇ, Nebil ARK, Kadriye Şerife UĞUR, Mehmet GÜNDÜZ  
Department of Otorhinology - Head and Neck Surgery, Faculty of Medicine, Fatih University, Ankara, Turkey

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**Aim:** Epistaxis is a common emergency in otorhinology. The aim of this study is to analyze the etiology, management, and accompanying disorders of epistaxis in geriatric patients by reviewing the literature

**Materials and methods:** Data of 117 patients 65 years old and older who presented to the Department of Otorhinology with active epistaxis between 2004 and 2010 were retrospectively reviewed. Records were evaluated for age, sex, accompanying disorders, drug medication, detailed otorhinological findings, and management of epistaxis.

**Results:** There were 67 women (57.26%) and 50 men (42.74%) with a mean age of 73.51 years (range: 65–90). Ninety-four (80.34%) patients had accompanying disorders such as hypertension, diabetes mellitus, cerebrovascular disease, sinusitis, chronic obstructive lung disease, nasal polyp, and drug treatment. The bleeding site was anterior in 90 patients (76.92%) and posterior in 16 (13.67%). In 11 patients (9.4%), the bleeding site was not identified. Fifty-seven patients (48.71%) were treated with cauterization, 17 patients (14.52%) with nasal packing, 12 patients (10.25%) with medical treatment, 1 patient (0.85%) with mass excision and nasal packing, and 19 patients (16.23%) with more than 1 treatment method. Six patients (5.12%) were untreated because of the unidentified bleeding point. Bleeding control was performed under local anesthesia in 113 patients (96.58%) and under general anesthesia in 4 patients (3.41%). Twenty-one patients (17.94%) were hospitalized and 3 patients (2.56%) required a blood transfusion.

**Conclusion:** Epistaxis is the most common otorhinological emergency. It must be evaluated carefully to avoid the potential complications resulting from both epistaxis and its associated disorders, especially in geriatric patients.

**Key words:** Epistaxis, cauterization

### 1. Introduction

Epistaxis is one of the most common nasal emergencies, with an incidence ranging from 30 to 100 per 100,000 each year (1). The lifetime occurrence rate of epistaxis is approximately 60% (2). However, most bleeding episodes are minor and require no medical treatment. Minor bleeding episodes occur more frequently in children and adolescents, whereas severe bleeds requiring otorhinological intervention often occur in patients older than 50 years (3).

Anterior nosebleeds are observed in approximately 80% patients with epistaxis (4). They arise from an anastomosis called Kiesselbach's plexus in the lower portion of the anterior septum, called Little's area. Conservative treatment methods are often sufficient for most patients with anterior epistaxis. These methods include local pressure, chemical cautery, and anterior nasal packing (5). Posterior bleeding originates primarily from the posterior septal nasal artery, a branch of the sphenopalatine artery, and tends to be more serious compared with anterior

bleeding. Conservative methods are generally insufficient for the treatment of patients with posterior epistaxis, who often require further otorhinological intervention (6). Further treatment options include posterior packing, arterial ligation, and embolization. Treatment modalities differ because of factors such as site and severity of bleeding, predisposing conditions, and experience of the otorhinologist.

Various local and systemic factors cause epistaxis. Common local factors include digital trauma, nasal septal deviation, neoplasia, inflammation, and chemical irritants, whereas coagulopathies, renal failure, alcoholism, and vascular abnormalities are common systemic factors (7,8).

Patients presenting with epistaxis in the geriatric population must be evaluated carefully. The clinical status of geriatric patients may deteriorate quickly; therefore, rapid evaluation and treatment of these patients must be performed (4).

In this study, the etiology, management, and accompanying disorders of epistaxis were analyzed in

\* Correspondence: alyuksel2003@yahoo.com

geriatric patients. A review of the relevant literature is also presented.

## 2. Material and methods

The data of 156 patients aged  $\geq 65$  years, who presented to the Department of Otorhinolaryngology with active epistaxis between 2004 and 2010, were retrospectively reviewed. Patients were identified by a search of the electronic data record system of the hospital. In total, 39 patients were excluded, 22 because they presented with epistaxis caused by trauma and 17 because of insufficient data. Therefore, 117 patients with a diagnosis of epistaxis as confirmed by chart review were eligible for the study. Epistaxis was defined as bleeding from the nasal cavity as confirmed by nasal inspection on initial evaluation. The condition of active or inactive epistaxis was determined on the basis of the nasal inspection results. The localization of epistaxis was classified as diffuse or limited and unilateral or bilateral. The bleeding site was identified as anterior or posterior after nasal endoscopic examination using  $0^\circ$  and  $30^\circ$  rigid endoscopes. Anterior epistaxis was identified in cases in which the bleeding site was visible on anterior rhinoscopy (9).

Patients were labeled positive for hypertension if this condition was stated in their medical charts or if they were on antihypertensive medication. Treatment with anticoagulant medication such as Coumadin, heparin, Fraxiparine, or aspirin was ascertained during evaluation. Records were examined to obtain information regarding age, sex, accompanying disorders, detailed otorhinolaryngological findings, and management of epistaxis. This study was approved by the local ethics committee of the hospital.

## 3. Results

This study included 67 women (57.26%) and 50 men (42.74%) with a mean age of 73.51 years (range: 65–90 years). Ninety-four (80.34%) patients had accompanying disorders such as hypertension, diabetes mellitus, cerebrovascular disease, sinusitis, coronary artery disease, nasal polyp, or a history of drug medication (Table 1).

**Table 1.** Underlying disorders.

Hypertension	91 (77.7%)
Diabetes mellitus	69 (58.9%)
Coronary artery disease	17 (14.5%)
Anticoagulant medication	13 (11.1%)
Sinusitis	11 (9.4%)
Nasal polyp	9 (7.6%)
Cerebrovascular disease	3 (2.5%)

The bleeding site was anterior in 90 patients (76.92%) and posterior in 16 (13.67%). In 11 patients (9.4%), the bleeding site was not identified. Treatment modalities used for the management of epistaxis in the patients included in this study are shown in Table 2. No bleeding points were identifiable in 6 patients (5.12%). Epistaxis healed spontaneously in all patients, with no evidence of recurrence on follow-up. Bleeding control was performed under local anesthesia in 113 patients (96.58%) and under general anesthesia in 4 (3.41%). Twenty-one patients (17.94%) were hospitalized and 3 (2.56%) required a blood transfusion.

## 4. Discussion

Bleeding from the nose is a common complaint, and it occurs in approximately 10% of the population at any given time (10). Epistaxis may lead to mortality and morbidity in vulnerable groups such as children and the elderly and in patients with additional systemic disorders.

The interaction of several local and systemic factors results in nosebleeds. These factors damage the nasal mucosa, affect the vascular structure, and/or disrupt blood clotting. They include environmental conditions, trauma, nasal septal deviation, tumors, inflammation, bleeding disorders, anticoagulant medications, hypertension, and age. In geriatric patients, systemic factors such as hypertension, advanced age, and bleeding disorders are the most common causes of serious epistaxis (7,8). Vascular wall changes associated with ageing, such as fibrosis of the arterial tunica media, have been implicated in the development of epistaxis. Therefore, elderly patients are at higher risk of epistaxis (11).

The prevalence of hypertension in patients with epistaxis reportedly ranges from 24% to 64% (12). Another controlled study provided a relationship between epistaxis and high blood pressure (13). In contrast, a cross-sectional study in patients with hypertension found no independent association between the severity of epistaxis and hypertension (14). Other studies have suggested that hypertension in patients with epistaxis may be related to anxiety (15). Ninety-one (77.7%) of the 117 patients in our study group had a history of epistaxis. The role of hypertension in epistaxis is controversial, and the evidence available is insufficient to prove a significant association between hypertension and epistaxis. However, the control of epistaxis may be more difficult in patients with hypertension (7).

In rare cases, epistaxis may be a life-threatening emergency, especially in elderly patients with hypertension and severe hemorrhage (10). In our study group, none of the patients required resuscitation despite old age ( $>65$  years old) and underlying disorders (80.34% patients).

Coagulation screening is not routinely used in our institution. Studies have shown that routine coagulation

**Table 2.** Treatment modalities.

	SN	EC	AP	PP	MT	SN + AP	ME + AP
Anterior	48	2	10		12	17	1
Posterior		7	5	2		2	

SN = silver nitrate, EC = electrocautery, AP = anterior packing, PP = posterior packing, MT = medical treatment, ME = mass excision.

studies such as prothrombin time and activated partial thromboplastin time are not necessary in patients with epistaxis. Coagulation screening should be used in patients with suspected clotting disorders or in patients who receive anticoagulation treatment (16,17).

The first step in the treatment of acute epistaxis is identification of the bleeding point. In our study, 90 (76.92%) of the patients had anterior epistaxis. This incidence rate is compatible with the rates reported in the literature (4). After localization of the bleeding point, chemical cautery or electrocautery can be performed. Silver nitrate can be used as a chemical cauterization agent, especially for minor bleeding, with minimal discomfort. Electric cauterization must be performed for more aggressive bleeding from the anterior septum. Cauterization should be one-sided in order to prevent septal perforation (18). There is no evidence to prove that electrocautery has any advantage over silver nitrate cautery (10). In our study group, 90 (76.92%) patients had anterior epistaxis, 48 (41.02%) of whom were successfully treated with silver nitrate cautery. Only 2 patients were treated with electrocautery because of severe epistaxis from the anterior septum.

In the case of cauterization failure, nasal packing must be considered as the next treatment option. Many different types of packs are available, including absorbable, nonabsorbable, anterior, and posterior packs. Common absorbable materials used for anterior packing include oxidized cellulose (e.g., Surgicel, Johnson & Johnson, New Brunswick, NJ, USA) and gelatin foams (e.g., Gelfoam, Pfizer, New York, NY, USA). Another product that combines thrombin with gelatin (e.g., Floseal, Baxter Health Care Corp, Deerfield, IL, USA) is used as a high-viscosity gel for hemostasis (19). All these absorbable products are easily used and cause minimal pain and discomfort.

Various kinds of nonabsorbable packing materials are also available, including inflatable balloons, calcium alginate, polyvinyl alcohol (e.g., Merocel, Medtronic XOMED, Jacksonville, FL, USA), and petroleum jelly-impregnated gauze. The major disadvantage of anterior packing with these materials is the need for removal of the material and the pain associated with placement and removal. Complications caused by anterior packs

include ulcerations, septal perforation, sinusitis, synechia, hypoxemia, and arrhythmias (20). Contrarily, Kurtaran et al. reported that nasal packing with airway tubes is not a cause for postoperative respiratory dysfunction and hypoxia (21). Merocel is most commonly used for anterior packing in our institution. None of the complications mentioned above were observed in this study, although our study group comprised geriatric patients.

Approximately 10% of all nosebleeds arise from the posterior part of the nose (22). Posterior epistaxis is often encountered in elderly individuals (23). This condition may be associated with diseases such as hypertension and arterial degeneration (24). In our study group, 16 (13.67%) patients had posterior epistaxis. Although no research on epistaxis in geriatric patients is available, the incidence of posterior epistaxis in this study was not significantly higher than that in the normal population. In this study, a formal posterior pack made of ribbon gauze was used in 2 patients, although balloon catheters are more commonly used. However, posterior packing is associated with increased risk of mortality and morbidity. Nasal packing may cause significant hypoxia, especially in patients with chronic systemic disorders (10).

In some cases, traditional nasal packing fails to control the epistaxis. Angiographic embolization or endoscopic techniques for sphenopalatine artery ligation can be used for the control of intractable bleeding. Angiographic embolization for posterior epistaxis was first described in 1974 (25), with success rates ranging from 79% to 96% (26). Complications of embolization include rebleeding, stroke, blindness, facial numbness, skin sloughing, and groin hematoma. A success rate of 98% was reported for endonasal ligation of the sphenopalatine artery to control bleeding in 127 patients; no significant treatment-related complications were reported in that study (27). In our study, all patients with epistaxis were treated using conventional methods. No further interventions such as embolization or sphenopalatine artery ligation were required.

Some authors recommend a formal nasal examination under general anesthesia in patients with posterior epistaxis (23). In our study group, only 4 (3.41%) of the 16 (13.6%) patients with posterior epistaxis were treated under general anesthesia. In fact, treatment of epistaxis under general anesthesia is easier than treatment under

local anesthesia for both the surgeon and the patient; however, general anesthesia can be dangerous for geriatric patients with systemic disorders. Bleeding control was performed under local anesthesia in 113 patients (96.58%). Twenty-one patients (17.94%) were hospitalized and 3 (2.56%) required a blood transfusion.

In conclusion, epistaxis, which is the most common otorhinolaryngological emergency, must be evaluated

carefully to avoid the potential complications resulting from both epistaxis and its associated disorders, especially in geriatric patients. Multiple methods for treating anterior and posterior epistaxis are available, and occasionally more than one treatment is used. Otolaryngologists must be prepared to deal with severe bleeding through the use of medications, packing materials, and radiological or surgical interventions, especially in geriatric patients.

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