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Epistaxis: A Review

Abdullah D. Alotaibi*

Department of Otolaryngology Head and Neck Surgery, College of Medicine, University of Hail, Hail, Saudi Arabia

**Corresponding e-mail: adqo@yahoo.com*

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ABSTRACT

In recent years, various therapeutic options and guideline modulates have been introduced to attain ongoing eventual and recurrent epistaxis treatment. Epistaxis management is developing due to progress in therapeutic options and clinical intervention procedures. This article aimed to review the literature related to epistaxis management, including treatment guidelines and therapeutic options. Pathophysiology, etiology, and initial clinical examination were also discussed in this article. Consequently, the approaches in terms of epistaxis clinical care and appropriate intervention states based on the current literature were introduced, making a broad platform for making suitable clinical decisions and treatment options.

Keywords: Epistaxis management, Nasal packing, Hereditary Hemorrhagic Telangiectasia (HHT), Nosebleed

INTRODUCTION

Nosebleed or epistaxis is categorized among the commonest Ear, Nose, and Throat (ENT) emergencies frequently encountered in primary health care clinics or emergency units. Epistaxis is categorized into anterior (constituting the commonest nosebleed) and posterior. The latter is less common but more likely to require medical assistance. Around 90% of the anterior nosebleeds originated within Kiesselbach's plexus (Little's area) on the anterior nasal septum. The vessels branches supplying the nasal cavity include the anterior ethmoid artery, posterior ethmoid artery, sphenopalatine artery, greater palatine artery, and superior labial artery [1,2]. These vessels in the anterior nasal septum (watershed area) involve Kiesselbach's plexus, which rests at the entrance to the nasal cavity, and it is, therefore, subject to extremes of heat and cold and easily traumatized. The septum contains fragile mucosa, which is easily traumatized, prompting epistaxis. Posterior epistaxis can rarely originate from the posterior vessels and usually occur in patients with coagulation disorders, hypertension, and vascular disorders [1,3].

Epistaxis is estimated to happen in 60% of the general population during a lifetime and is responsible for more than 1.7/100,000 population emergency department (EM) visits. It is more frequent in males compared to females and at the age < 10 years & between 70-79 years (especially posterior epistaxis) [2,4,5].

LITERATURE REVIEW

Causes of Epistaxis

The causes of epistaxis are divided into local, systemic, and idiopathic causes. Local causes include four main factors: inflammatory, structural factors, traumatic factors, and tumors and vascular malformations. Inflammatory local causes include chronic sinusitis, environmental irritants, granulomatous disease, pyogenic granuloma, and viral illness. Structural causes involve septal deviation or perforation. Traumatic causes are usually associated with cocaine usage, foreign body, nasal fracture, nasal intubation, nasal oxygen, nose picking, surgical procedure, and topical medication (such as intranasal steroids). The most apparent systemic causes of epistaxis comprise; anticoagulants, coagulopathy,

hemophilia, leukemia, liver disease, thrombocytopenia, vitamins A, C, D, E, and K deficiencies [3,6]. Hereditary factors were also reported, such as genetic platelets disorder Hereditary Hemorrhagic Telangiectasia (HHT) [7,8]. Idiopathic epistaxis occurs in some conditions, such as Eales disease [9].

Management of Epistaxis

Initial assessment of the patient should begin with examining the nose using a nasal speculum and use of treatment to control the epistaxis. Although most episodes of epistaxis can be controlled at home with minimal measures, and only 6% of the cases require medical interventions, epistaxis is still a common ED presentation [2,10]. When first aid measures fail, an anterior nasal packing can be employed. For blood clot stability, tranexamic acid is usually used [11].

Guidelines

However, several clinical guidelines have been recently developed for the management of epistaxis. One of these is the latest guidelines developed by Tunkel, et al. [12]. These recommend that: (i) initially the nosebleed should be identified whether requires prompt management or not, (ii) active bleeding should be treated promptly with sustained compression to the lower third of the nose for 5 minutes or longer, (iii) a-in case bleeding site can't be identified, and bleeding continues despite compression, nasal packing is advised, b- in patients with bleeding disorders or using anticoagulant medications or antiplatelet medications, the use of resorbable packing is advised, (iv) Patient undergoes nasal packing should be informed with packing placed, removal timing (in case non-resorbable), post-procedure care, and manifestations necessitate prompt reassessment, (v) factors increasing nosebleed tendency, such as the use of anticoagulant or antiplatelet or intranasal medications, or family history of bleeding disorders, should be documented, (vi) anterior rhinoscopy should be made after clot elimination (if any) to find the bleeding source, (vii) a-nasal endoscopy can be made to recognize bleeding site and guide additional management in cases with recurrent epistaxis in spite of previous treatment with packing or cautery or with recurrent one-sided epistaxis, b-nasal cavity and nasopharynx can be examined by nasal endoscopy in cases with complicated epistaxis or obscure pathology linked to epistaxis, (viii) bleeding site should be identified with an appropriate intervention, involving one or more of the following: topical vasoconstrictions, nasal cautery, and moisturizing or lubricating agents, (ix) When using nasal cautery is selected, it should be restricted only to active or suspected bleeding sites, and with use of anesthesia, (x) in cases, candidacy for surgical arterial ligation or endovascular embolization (in cases with recurrent or uncontrolled bleeding), epistaxis should carefully evaluated, (xi) first-line treatments, should be initiated prior to transfusion, reversal of anticoagulant, or withdrawal of anticoagulant medications, particularly in the absence of life-threatening bleeding, (xii) in cases of suspected telangiectasias, patient should be tested for Hereditary Hemorrhagic Telangiectasia syndrome (HHT) (Osler-Weber-Rendu disease), (xiii) epistaxis patients and their caregivers should be educated about preventive measures, home treatment, and indications for seeking further medical care, (xiv) in patients treated with non-resorb able packing, surgery or arterial ligation, the outcome of intervention should be documented within 30 days [12].

Clinical Options

Before nasal packing, the use of agents, such as tranexamic acid, may be sensible due to patients' soreness and potential worries. Topical tranexamic acid has a potential role in treating epistaxis in ED. Concentrations of 10%, 31.2%, and 71% were previously described to treat epistaxis with the most efficient tranexamic acid [13]. Oxymetazoline nasal spray or epinephrine can be used as compressive therapy. Topical vasoconstriction chemical cautery can be performed using silver nitrate and electrocautery. If these fail, topical treatment with nasal packing can be employed. Nasal tampon or gauze soaked with petroleum jelly, posterior gauze packing, balloon system (modified Foley catheter), and arterial ligation. Unlike anterior epistaxis, posterior epistaxis more frequently needs hospitalization and nasal packing, which is usually associated with pain and risk of aspiration [12,14]. Usually, the treatment procedures include sprays or creams working as physical barriers, even applied as tampons or gauze. Emoxilane®, a combination of sodium hyaluronate, silver salt, α-tocopherol acetate, and D-panthenol, has been designated. Emoxilane® independently behaves in various biological manners [15].

The management of severe or recurrent epistaxis requires an interdisciplinary team, including a primary care physician, emergency physician, an otolaryngologist. About 65% to 75% of the patients can be treated by a primary care physician or emergency physician adopting baseline procedures. If anterior epistaxis is continual, otorhinolaryngologists can control the bleeding using chemical or electrical cauterization. Surgical treatment may be more efficient than nasal

packing for posterior epistaxis. A percutaneous arterial ligation is an option for patients with a high risk of general anesthesia [16].

Furthermore, traditional management of posterior epistaxis with packing frequently results in initial treatment failure. Consequently, patients experience recurrent bleeding, which should be treated with local electrocautery or endoscopic ligation of the sphenopalatine artery to reduce the patient's discomfort, risk of recurrent, and treatment failure [17]. Sometimes posterior packing or surgery may fail for some patients. Endovascular therapy is strongly recommended in such patients and may be the only option [18].

In recent years Ethmoidal arteries are becoming the leading cause of severe refractory epistaxis. In this context, Stamm's S-point, an upper nasal septum bleeding point, around the projection of the axilla of the middle turbinate, posterior to the septal body, was lately defined. Stamm's S-point has a significant role in severe refractory epistaxis because of its rate of recurrence and steadiness. Nevertheless, this specific point is difficult to recognize; therefore, systemic endoscopic measurement should be implemented. The latest data has changed the concept of the primary source of severe epistaxis from the sphenopalatine artery to ethmoidal arteries and displayed elevated success rates for electro-cauterization of bleeding points as a single treatment of severe epistaxis [19].

Oral Anticoagulants (OAC) and OAC subgroups (e.g., vitamin K antagonists (VKA)) have some influence on epistaxis. Meta-analysis showed that epistaxis patients taking OAC have more promising results than VKAs [20].

Hereditary Hemorrhagic Telangiectasia (HHT)

HHT is an unusual autosomal dominant vascular disorder characterized by the development of mucocutaneous telangiectasia, aneurysm, and arteriovenous malformations and is usually associated with persistent epistaxis [21,22]. Over 90% of the patients revealed genetic mutations in Endoglin (ENG) or Activin receptor-like kinase 1 (ACVRL1/ ALK1) genes, and both belong to the TGF-β/BMP9 signaling pathway [23].

Most therapeutic options are based on coagulation with antifibrinolytic agents, such as tranexamic acid, or elevating the transcription of ENG and ALK1 by:

Hormonal receptors such as "bazedoxifene or raloxifene"

Antioxidants such as "N-acetylcysteine, resveratrol or immunosuppressants (tacrolimus),"

Use of antibodies (bevacizumab) or blocking therapies (etamsylate and propranolol) [23].

However, many therapeutic targets have been investigated, but they are mostly palliative with variable outcomes [24,25].

Epistaxis and COVID-19 Testing

Nasopharyngeal swab for COVID-19 testing can lead to some complications, including bleeding. Therefore, the risk of the sampling procedure should be meticulously evaluated [26]. Risk of injury and consequent epistaxis is expected because of the long passage via. the nasal cavity. The individual undertaking the swab must have a thorough knowledge of nasal anatomy. However, there are several changes in otolaryngology consultation patterns witnessed after the beginning of the COVID-19 pandemic, which may be attributed to novel pathologies, attitudes, and policies [27].

CONCLUSION

As epistaxis is still a persistent clinical presentation in the emergency department and otolaryngology clinics, various guidelines, and treatment options have been introduced, from nasal packing to surgical and genetic amendments. Posterior epistaxis and some idiopathic epistaxis conditions concern clinicians and otolaryngology specialists. Being aware of epistaxis management guidelines and newer therapeutic options and involving an interdisciplinary medical team usually improve the prolonged outcomes of recurrent epistaxis.

DECLARATIONS

Conflict of Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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