

Epistaxis: An Update on Contemporary Management**Bhavana¹, Shashank Sangoli²**¹Assistant Professor, Dept. of ENT, KBNIMS²Associate Professor, Dept. of Neurosurgery, MRMC**Received: 11-01-2026 / Revised: 11-02-2026 / Accepted: 02-03-2026****Corresponding Author: Dr. Shashank Sangoli****Conflict of interest: Nil****Abstract:**

Background: Epistaxis, or nasal bleeding, remains one of the most common emergencies encountered in otorhinolaryngology. While the majority of cases are self-limiting and originate from the anterior nasal septum, posterior epistaxis can be life-threatening, requiring urgent hospital admission, packing, or surgical intervention.

Objectives: This clinical review synthesizes modern diagnostic pathways, stepwise intervention strategies, and recent updates in the acute management of both anterior and posterior epistaxis.

Methods: Narrative synthesis of current clinical guidelines and institutional protocols, detailing acute resuscitation, contemporary topical therapies, and surgical ceiling interventions.

Results: Traditional, highly painful approaches like non-absorbable nasal packing are increasingly being replaced by targeted endoscopic intervention and absorbable biometric materials. Recent advances in high-definition nasal endoscopy, topical hemostatic agents (such as tranexamic acid), absorbable nasal packing materials, and minimally invasive surgical techniques have significantly improved patient comfort and clinical outcomes while dramatically reducing the length of hospital stays and recurrence rates.

Conclusion: A structured, evidence-based approach involving prompt stabilization, precise localization of the bleeding source, and early endoscopic intervention provides excellent clinical outcomes and minimizes patient morbidity.

Keywords: Epistaxis, Nasal Endoscopy, Sphenopalatine Artery Ligation, Tranexamic Acid, Nasal Packing.

DOI: 10.25258/ijcpr.18.3.313

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Introduction

Epistaxis affects nearly 60% of individuals during their lifetime, making it one of the most ubiquitous clinical presentations in emergency medicine and otorhinolaryngology; however, only approximately 6% to 10% of affected individuals ultimately require formal medical attention [1, 2]. The condition exhibits a bimodal age distribution, peaking in children under 10 years of age and in older adults between 45 and 65 years of age [3].

Anatomically, nasal bleeding is categorized based on its relationship to the ostium of the middle turbinate. Most episodes (approximately 90%) arise from the anterior nasal septum, specifically within Kiesselbach's plexus (also known as Little's area) [1]. This region forms an exposed, highly vascular anastomotic network fed by the terminal branches of both the internal and external carotid artery systems [3]. Conversely, posterior epistaxis is significantly less common but much more severe. It arises primarily from the sphenopalatine or posterior ethmoidal arteries and is frequently encountered in elderly patients [4]. This cohort often presents with complex co-morbidities, including chronic hypertension, advanced atherosclerosis, or a history

of antiplatelet and anticoagulant therapy, which disrupt normal clot formation and complicate management [2, 3].

Initial Assessment and Triage: When a patient presents with active epistaxis, clinical priority must follow a strict, structured emergency algorithm to prevent airway compromise or hypovolemic shock.

Resuscitation and Hemodynamic Evaluation: The first priority in any acute presentation is the rapid assessment of airway, breathing, and circulation (the ABCs) [3]. Patients presenting with profuse, unremitting bleeding must be evaluated immediately for signs of hemodynamic instability, such as tachycardia, hypotension, or altered mental status. In cases of severe hemorrhage, establishing large-bore intravenous access, initiating crystalloid fluid resuscitation, and cross-matching blood products are vital prerequisites before attempting localized nasal instrumentation [1, 4].

Clinical History and Physical Examination: Once the patient is stabilized, a targeted clinical history should be gathered from the patient or family members. Key elements must isolate:

- The duration and perceived severity of the current episode.
- The primary side of onset (to aid in localizing the source).
- Any history of digital or maxillofacial trauma.
- A thorough medication reconciliation, paying specific attention to antiplatelet agents (e.g., aspirin, clopidogrel) and oral anticoagulants (e.g., warfarin, direct oral anticoagulants like apixaban or rivaroxaban) [1, 3].

Following history collection, the nasal cavity must be cleared of blood and obstructive clots. This is best accomplished by instructing the patient to gently blow their nose, followed immediately by targeted suctioning under direct visualization [2].

Diagnostic Nasal Endoscopy: Relying solely on an anterior nasal speculum and a headmirror often fails to identify posterior or deep septal bleeding points. Rigid nasal endoscopy (0° or 30° optics) has revolutionized the initial evaluation phase [4]. It allows the clinician to systematically survey the nasal cavity—moving from the anterior septum along the floor to the sphenopalatine recess—to accurately pinpoint active bleeding, mucosal ulcerations, or prominent vascular spurs before applying treatment [1].

Contemporary Management Matrix: Management should follow a stepwise, escalated protocol, advancing from simple non-invasive maneuvers to advanced surgical intervention based on the severity and site of the hemorrhage.

First Aid and Initial Hemostasis: Before applying medical tools, basic first-aid interventions must be enforced. The patient should sit completely upright and lean slightly forward [1]. Leaning backward must be discouraged, as it causes blood to drain into the pharynx, leading to airway irritation, coughing, or gastric irritation and hematemesis. Constant, manual pressure should be applied by pinching the soft cartilaginous part of the nose continuously for 10 to 15 minutes [2]. This directly compresses Kiesselbach's plexus against the septum.

Topical Vasoconstrictors and Chemical Cautery: If direct pressure fails to halt anterior bleeding, a cotton pledget soaked in a topical vasoconstrictor

(such as 0.05% oxymetazoline or 4% cocaine solution) paired with a local anesthetic should be placed into the nasal cavity for 5 to 10 minutes [1, 3].

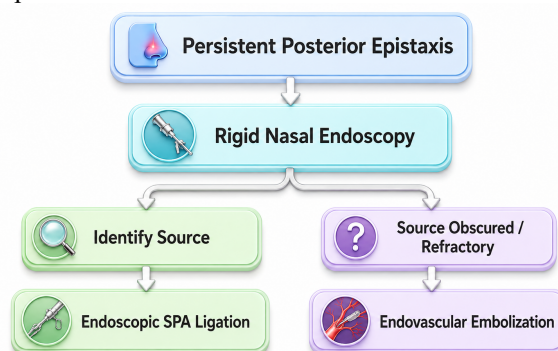
Once the active bleeding has slowed and the specific vessel is isolated, chemical cautery using silver nitrate (AgNO_3) applicator sticks is the preferred first-line intervention [2]. The applicator should be applied lightly to the mucosa immediately surrounding the bleeding point in a concentric fashion for 5 to 10 seconds before treating the active point itself.

Clinical Warning: Cautery must never be performed bilaterally on opposing sides of the nasal septum during the same clinical encounter. Doing so compromises the perichondrial blood supply and carries a high risk of iatrogenic septal perforation [1, 4].

Evolution of Nasal Packing Materials: When localized cautery is ineffective or unavailable, nasal packing becomes necessary. Traditional management relied heavily on non-absorbable packing (such as ribbon gauze impregnated with petroleum jelly or expandable polyvinyl alcohol sponges) [3]. These materials act through mechanical compression but cause substantial tissue ischemia, severe patient discomfort, and a high risk of re-bleeding upon removal due to disruptions of the newly formed clot [1, 2].

Modern protocols strongly advocate for absorbable hemostatic materials (e.g., carboxymethyl cellulose mesh, oxidized regenerated cellulose, or porcine gelatin matrix) for anterior bleeding [1]. These biomaterials conform easily to the irregular contours of the nasal cavity, promote intrinsic platelet aggregation, and dissolve naturally through enzymatic action and saline irrigations. This eliminates the need for painful packing removal and protects the fragile, healing mucosal lining [4].

Advanced Interventions for Refractory Epistaxis: When anterior packing fails or when the bleeding originates from the posterior nasal cavity, the patient must be escalated to advanced therapeutic pathways.



Endoscopic Sphenopalatine Artery (SPA)

Ligation: Persistent posterior epistaxis is best managed surgically via endoscopic sphenopalatine artery (SPA) ligation [4]. Under general anesthesia, a mucosal flap is elevated in the lateral nasal wall posterior to the middle turbinate to isolate the sphenopalatine foramen. The main branches of the SPA are then securely clipped or bipolarized. This targeted approach has a success rate exceeding 90% and avoids the significant morbidity, hypoxia, and prolonged hospital stays associated with posterior balloon or gauze packing [3, 4].

Endovascular Embolization: Interventional radiology and endovascular embolization are reserved primarily for patients who are poor candidates for general anesthesia or those who present with refractory bleeding despite previous surgical ligation [2]. Through femoral or radial arterial access, angiography is used to map the external carotid system, allowing super-selective embolization of the maxillary artery or its branches using polyvinyl alcohol particles or microcoils [3]. It carries a low but serious risk of cerebrovascular accidents or facial nerve palsies, requiring experienced interventional specialists [4].

Recent Advances and Individualized Care: Contemporary rhinological practice has shifted from a standardized "one-size-fits-all" packing routine toward a precise, personalized care model.

- **Topical Tranexamic Acid (TXA):** The application of TXA (an antifibrinolytic agent) directly to compressible or bleeding nasal mucosa via soaked pledgets has gained widespread support. Clinical trials show that topical TXA significantly reduces the need for anterior packing, lowers re-bleeding rates within 24 hours, and improves overall patient satisfaction [1].
- **Management of Anticoagulated Patients:** In patients taking direct oral anticoagulants or

antiplatelet therapies, routine reversal of medication is no longer recommended unless the hemorrhage is life-threatening [1, 3]. Instead, local management using absorbable hemostatic agents and early endoscopic cautery should be maximized to maintain the patient's systemic thromboembolic protection [1, 2].

Conclusion

Managing epistaxis effectively requires moving away from aggressive blind nasal packing and adopting a structured, evidence-based approach centered on early visualization and targeted hemostasis. Early use of rigid nasal endoscopy, topical antifibrinolytics like TXA, and absorbable biometric packing materials ensures high success rates while minimizing complications and shortening hospital stays. For posterior or refractory cases, early endoscopic sphenopalatine artery ligation stands as the modern gold-standard surgical option, delivering excellent patient outcomes.

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