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Review Article

Importance of S-point in the Management of Severe Epistaxis

Raid M. Al-Ani*
Department of Surgery, College of Medicine, University of Anbar, Anbar, Iraq
* Corresponding author's email: med.raed.alani2003@uoanbar.edu.iq

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ABSTRACT

Although severe epistaxis is uncommon, it is serious. The systematic endoscopic nasal examination is an essential step in identifying the bleeding point and aiding electrocauterization. Currently, the S-point, which is located in the superior part of the nasal septum behind the septal body and corresponding to the axilla of the middle concha, is identified in about 30% of cases with severe epistaxis. Cauterization of this point has an excellent rate of controlling the bleeding and preventing its recurrence. We aimed to highlight the significance of the S-point in the management of severe cases of epistaxis.

Introduction

Epistaxis is a common emergency problem encountered in the field of Otolaryngology. It can be defined as bleeding from the nose and/or the nasopharynx. Although it is simple in the majority of cases, it induces psychological upset in the patients or their relatives and the dealing doctor (1).

Epistaxis could be anterior or posterior. Anterior epistaxis is usually simple and treated with conservative measures. However, the posterior type is serious and relatively difficult to treat, particularly in the pre-endoscopic era or when the bleeding point is not identified, as many cases might end with serious complications like hypovolemic hemorrhagic shock or recurrence following the treatment with a posterior pack or other measures (2). Despite epistaxis management being easy to apply in the majority of cases, it can be difficult in certain patients with a cardiovascular abnormality or coagulation disorder (3).

Nowadays, with the wide use of the endoscope in the assessment of patients with epistaxis, identification as well as cauterization of the bleeding point is an essential aspect in the management of severe epistaxis (4).

In 2018, Aldo Cassol Stamm from Brazil discovered a source of bleeding from the superior part of the nasal septum around the axilla projection of the middle turbinate. The septal body is located

anteriorly to this point. It was called "Stamm's S-point". The bleeding comes from the anterior ethmoidal artery and is considered a source of active bleeding (Figure 1). Electrocautarization of this point shows excellent results in all treated cases (5).

In this narrative mini-review, we aimed to explore the significance of S-point identification in the management of severe nosebleeds.

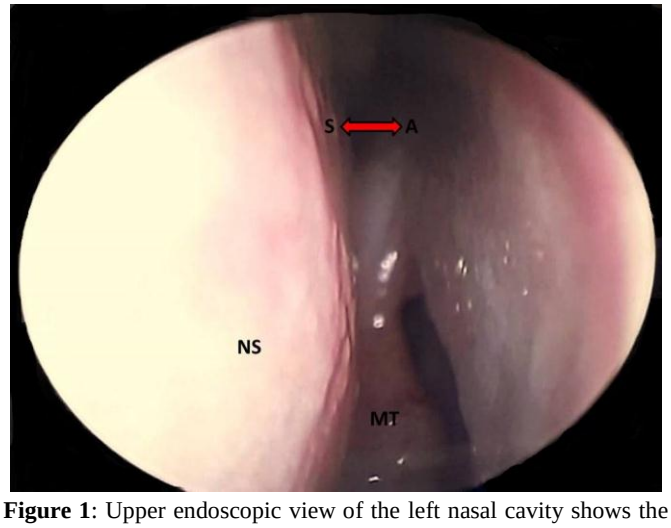

Figure 1: Upper endoscopic view of the left nasal cavity shows the nasal septum (NS), middle turbinate (MT), axilla of the middle turbinate (A), and the location of the S-point (S).

Epidemiology

Nosebleeds or epistaxis is a common condition encountered in the emergency units or Otolaryngology clinic. It was estimated in the USA to be 1/200 of all cases in the emergency unit (6). In the general population, there is a prevalence of 60% of an attack of epistaxis during their lifetime. However, only 10% of the cases seek medical advice (7). Male is more affected than female (8). There is a bimodal age distribution (2-10 years and 50-80 years) (7). The highest incidence of epistaxis occurs in people aged 70 years or more. Those people, there is three times more to seek advice than children (6). Epistaxis is rarely causing death, however, it carries significant morbidity, especially in older age groups or patients with a history of chronic diseases like cardiovascular problems. Although in the majority of cases, the management of nose bleeds is easy to apply, it carries a challenge for the care providers in the emergency department (8).

Vascular anatomy of the nose

The nose is divided into two nasal cavities by a nasal septum. The septum is lined with a rich vascular mucous membrane. Generally, a nosebleed is divided into anterior (most common but less severe) and posterior (less common but more severe). This division depends on the vascular blood supply (Figure 1) (9).

Anterior nosebleed usually comes from the Little's area or Kiesselbach plexus, which is situated in the anterior part of the septum (5 mm behind the caudal end and 5 mm above the nasal floor) (10). While posterior bleeding comes from the sphenopalatine arteries at the posterior part of the nasal cavity (11). Moreover, posterior epistaxis may come from the internal carotid artery itself, leading to catastrophic bleeding (12).

For a long period, there is a general belief that the severe epistaxis originates from the posterior part of the nose, from a vascular pedicle called Woodruff's plexus. Nowadays, this belief changed when Aldo Cassol Stamm from Brazil in 2018 described a bleeding point from the upper part of the nasal septum around the axilla projection of the middle concha. The septal body is located anteriorly to this point. It was called "Stamm's S-point". It contains an arterial vascular pedicle (from the anterior ethmoidal artery) and is considered a source of active bleeding (5). Stamm and his colleagues conducted a retrospective study of 9 cases with severe epistaxis with the S-point bleeding by an endoscopic examination (5). All these cases were treated by cauterization without evidence of recurrence on a mean of 10 months of the follow-up period. The majority of cases were males, older age (mean age of 59.3 years), presented with anteroposterior epistaxis, and with comorbidities. There was a slight left-sided epistaxis predominance.

Recently, Rezende and his colleagues reported that the S-point area is surrounded by one or several vascular arches. These arches originate superiorly from branches of the anterior ethmoidal and posterior ethmoidal arteries, and inferiorly from the posterior septal artery (13). Therefore, this area constitutes a significant source of bleeding in considerable cases of severe epistaxis.

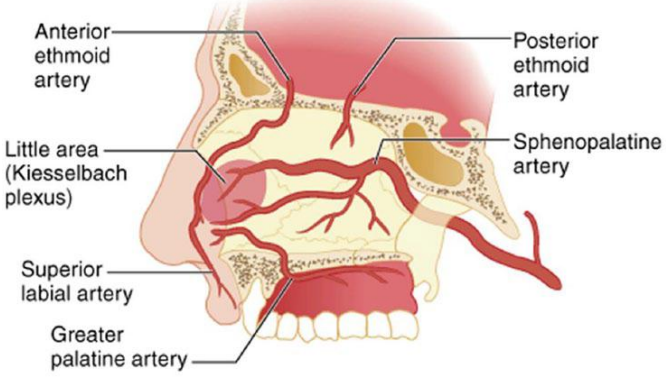

Figure 2: Vascular supply of the nose (Source: Tintinalli JE, Stapczynski JS, Ma OJ, et al. Tintinalli's Emergency Medicine: A Comprehensive Study Guide.7th ed. 2011. New York (NY): McGraw-Hill Education. © McGraw-Hill Education. All rights reserved.)

Severe epistaxis

Severe nosebleeds are defined as any attack of massive hemorrhage from the nose that needs immediate resuscitation and management (14). Fluid replacement and blood transfusion are necessary for 20% of patients with hemodynamically unstable conditions (15). Immediate anterior or posterior packing might be beneficial in controlling severe epistaxis. Different materials (such as Rapid Rhino or bismuth, iodoform and paraffin paste impregnated gauze, and Merocel packs) can be used in anterior nasal packing. While posterior packing is usually achieved by balloon catheters (Foley catheters and newer dual balloon catheters) (16). However,

in 3.5% of severe cases, surgical intervention is the solution for the such condition (17).

There are several surgical options for controlling epistaxis including; trans-antral maxillary artery ligation through a Caldwell–Luc procedure, septal surgery, arterial embolization under radiological control, external carotid artery ligation, anterior and posterior ethmoidal artery ligation, and sphenopalatine artery ligation (18). Ligation of anterior ethmoidal, posterior ethmoidal, and sphenopalatine arteries under endoscopic guidance is preferable to the traditional surgical approaches owing to the following; effective in controlling bleeding points under vision, simple, low complication rate, and short hospital stay (19). However, they need to clip all branches of these arteries.

Lakhani et al. 2013 adopted a Wexham Criteria for selecting patients with severe epistaxis for sphenopalatine artery ligation (20). It includes the following:

1. Severe persistent epistaxis from the posterior part of the nose that is not controlled by packing.
2. Drop in the level of hemoglobin more than 4 g/dL and/or those who need a blood transfusion.
3. Three attacks of recurrent epistaxis need re-packing through the time of hospital admission
4. Repeated admission to the hospital for recurrent episodes of epistaxis on the same side (more than three times during the last 3 months).

Systematic endoscopic nasal examination

Using an endoscope in the field of Otorhinolaryngology carries a revolution in the management paradigm of patients with severe epistaxis. It has changed from complicated measures, such as ligation of the external carotid artery ligation to precise and early detection of the bleeding point (5). Currently, researchers recommend a systematic endoscopic nasal examination (SENE) in handling a case with severe epistaxis (21). The SENE can identify the bleeding points in around 70% (22).

Owing to the hiding location of the S-point (behind the septal body), routine anterior rhinoscopy cannot be able to detect it. Therefore, SENE is a relevant method for the diagnosis of bleeding points in severe epistaxis, particularly from the S-point. It was reported in the literature that the prevalence of the S-point identification in severe epistaxis ranged from 28.3% to 28.3% and is considered the commonest identified site (22,23). Once the S-point is identified, electrocauterization is an excellent way (reaching up to 100%) for controlling active bleeding and preventing its recurrence (24).

The SENE is performed by a well-trained Otolaryngologist, either under local or general anesthesia in a well-equipped room (clinic or operating theater). The following points should be kept in mind in performing the evaluation; using a zero- or 30-degree rigid nasal endoscope, maintaining normal blood pressure during general anesthesia, avoiding using local nasal decongestants, and three-pass maneuver is used for comprehensive nasal examination (22).

The benefit of maintaining normal blood pressure and avoidance of any nasal decongestants is to avoid false negative results because omitting both these can lead to the disappearance of the bleeding point or the vascular source of bleeding. A bleeding point is defined as any site of active bleeding or a prominent vessel with evidence of a recent source of bleeding. While, oozing or diffuse bleeding from nasal mucosal abrasions or tears are not considered bleeding points, because they can be caused by anterior or posterior nasal packing (22).

The systematic search for the bleeding point aims to examine all parts of the nasal cavity, from superior to inferior and from the anterior part to the posterior part. At the beginning of the examination, the rigid endoscope is directed to the upper part of the nasal cavity to examine the lateral nasal wall including the middle concha and adjacent nasal septum. After that, the endoscope is directed more superiorly to assess the nasal roof with adjacent nasal septum till the superior concha is reached. Then the examiner removed the endoscope and directed it to evaluate the medial surface of the middle concha with its adjacent nasal septum till reaching the posterior aperture of the nose (choana). Then, the medial concha is medialized with gentle pressure by a saline-soaked cotton pledget to examine the middle meatus to the tail of the middle concha. The third pass is used to examine the medial surface of the inferior concha with its adjacent nasal septum until reaches the choana. In the end, the inferior concha is medialized with gentle pressure by a saline-soaked cotton pledget to examine the inferior meatus (22).

S-point identification

In cases of severe epistaxis, a 0-degree endoscope is used to examine the whole nasal cavity, particularly, the superior part. S-point is located behind the septal body corresponding with the axilla of the middle concha. (Figure 1). For the examination of the upper part of the nasal cavity, the endoscope should be directed to this area, above the middle meatus, which is usually not involved in traditional endoscopic nasal procedures. Two rules should be applied for proper detection of the S-point. First, gentle pressure on the septal body with a Cottle elevator, or sometimes septoplasty, is essential in the identification of this area. Second, two important steps are essential; maintaining the blood pressure at a normal level and avoiding the use of nasal decongestants. The application of a local vasoconstrictor during the endoscopic evaluation prevents visualization of the S-point (5).

A literature review focusing on the identification of S-point

We reviewed the literature and found that only three small case series investigated the importance of the identification of S-point as a bleeding source in subjects with severe epistaxis (5,22,23). Loures et al. reported that SENE was able to detect the bleeding points in 69.8% of patients with severe epistaxis. The Stamm's S-point was the most commonly identified bleeding point (28.3%). Superior bleeding points were detected in 27 cases out of 51 (22). Jeong et al. from the Republic of Korea 2021 reported a prevalence of S-point bleeding in patients with severe epistaxis of 28.8%. They also reported that the patients with this site of bleeding had lower body weight and hemoglobin levels in comparison with non-S-point bleeding subjects (23).

Conclusion

Early detection of the bleeding point through SENE and early treatment with electrocauterization carry effective ways of controlling bleeding, avoiding complications due to bleeding and preventing the recurrence of bleeding. S-point was identified in about 30% of cases with severe epistaxis. Although S-point is identified in considerable cases of severe epistaxis, only a few studies with small case series tackled this issue. Further studies are recommended on a large sample size of patients with severe epistaxis and from multicenter to find an effective regimen for the treatment of this condition.

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