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Epistaxis in Adults: Management and Outcome

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Abstract

Background Epistaxis is defined as bleeding from the nose. It is the most common emergency encountered by otolaryngologists. It affects all age groups and both genders. Several different modalities can be used to control nose bleeds.

Objective To study the association of different health conditions with epistaxis, effectiveness of emergency interventions to control it, and the outcome of each approach.

Methods One hundred eighteen patients with epistaxis were selected during the period of one year. Examination was done for all patients after securing the airway to determine the site of bleeding followed by the proper management. Different managements were studied for efficacy and outcome.

Results The mean age for epistaxis was 53.81 years with 71.2% of patients being older than 45 years, male to female ratio was 1.68:1. There was a strong association between the incidence of epistaxis and increasing age (P = 0.002) with male predominance. The anterior septum was the most implicated area in epistaxis (58%). The most commonly encountered intranasal pathology was a deviated nasal septum (25.4%). The most commonly associated systemic disease with epistaxis was hypertension (43%). Forty one percent of the patients were on anticoagulants. Collectively, only 25.4% of epistaxis were idiopathic in nature. The most commonly used intervention to stop the bleeding was silver nitrates cauterization (45%). Ninety two percent of the patients underwent a non-surgical method to stop the bleeding, and 78% underwent a direct approach. Most failures were observed in endoscopic assisted cauterization (41.6%). Seventy five percent were treated in an outpatient setting, while the rest were hospitalized. The use of a direct approach for epistaxis management was associated with significantly lower hospitalizations (P <0.001).

Conclusion Epistaxis affects adults in all age groups and incidence increases with age. The bleeding can be associated with a nasal pathology and/or a systemic abnormality. Epistaxis should be managed with a direct approach whenever possible to minimize hospitalizations.

Keywords Adults' epistaxis, endoscopic assisted cauterization, nasal packing

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List of abbreviations: ESPAL = Endoscopic sphenopalatine artery ligation

Introduction

Epistaxis is defined as bleeding from the nasal cavity [(1)]. It's the most frequent emergency encountered by an otolaryngologist [(1-3)] and sometimes it is very difficult to treat. It affects almost 60% of the general public in their lifetime [(2,4)] of which, about 6% need medical attention [(2)]. Generally, epistaxis is mild and patients frequently do not require medical intervention, but sometimes it is severe and rarely may lead to significant morbidity or even death [(1,5)].

Classification

Epistaxis is clinically classified based on the clearly observed patterns of presentation [1]:

1. Adult or childhood epistaxis: the variation of presentation with age is sufficiently pronounced to classify epistaxis as childhood (less than 16 years) or adult (greater than 16 years) [1].
2. Primary or secondary: Between 70% and 80% of all cases of epistaxis are idiopathic, spontaneous bleeds without any proven precipitant or causal factor. This type of bleeding can be classified as primary epistaxis. A small proportion of cases are due to a clear and definite cause such as trauma, surgery or anti-coagulant overdose and can be classified as secondary epistaxis [1].
3. Anterior and posterior epistaxis: The terms anterior and posterior epistaxis are frequently used but the definitions are imprecise and inconsistent. While some authors define the cut line between anterior and posterior epistaxis as the line passing through the pyriform aperture [1]; others advocate the use of the line passing through the maxillary sinus osteum [2].

Management

Treatment may be divided into direct (bleeding point specific therapies) or indirect treatments. Indirect treatments are those that do not require identification of the bleeding point. Direct treatments are logically and theoretically superior and, therefore, a committed search for the bleeding vessel should always be undertaken [1].

Direct management

Anterior epistaxis is usually very straightforward to identify and treat and over 90% of cases can be controlled with silver nitrate cautery or bipolar. The use of packing for primary anterior epistaxis is unwarranted and should be strongly discouraged [1].

Endoscopic control

Failure to locate the bleeding point on initial examination is an indication for examination with a rod lens endoscope. Endoscopy identifies the source of posterior epistaxis in over 80% of cases. Endoscopy enables targeted hemostasis of the bleeding vessel using insulated hot wire cautery or modern single fiber bipolar electrodes.

Indirect therapies

Failure to find the bleeding point is an indication for use of one of numerous traditionally favored indirect strategies [1].

Nasal packing

Packing can be anteriorly or posteriorly placed. Anterior packing has been the mainstay of treatment for centuries. Skills required for accurate packing are difficult to acquire and with modern techniques of nasal surgery, less frequently encountered in a surgeon's training. Ribbon gauze impregnated with petroleum jelly or Bismuth Iodoform Paraffin paste (BIPP) is inserted the entire length of the nasal cavity in attempt to tamponade the bleeding.

Surgical management [1]

If the techniques described above fail, surgical intervention is required. Endoscopic diathermy of the bleeding point under anaesthetic may control the bleeding but if the vessel still cannot be controlled (or even located) indirect surgical therapy is indicated. Surgical management for continued epistaxis consists of:

- Posterior packing
- Ligation techniques for one of the following arteries; sphenopalatine, internal maxillary, external carotid or anterior or posterior ethmoidal artery.
- Septal surgery techniques
- Embolization techniques

This study aimed to find the associations of different health conditions with adult epistaxis and to study the effectiveness of emergency

interventions to control epistaxis, and the outcome of each approach.

Methods

Source of data

This study was conducted in Al-Imamein Al-Kadhimein Medical City in the Outpatient Clinic of the Otolaryngology Department, or in the Emergency Department. The study sample was collected from the first of January 2019 to the first of January 2020 and included (118) patients.

Inclusion criteria

1. Patients with active epistaxis aged 16 years old and above.
2. Patients providing consent for all interventions.

Exclusion criteria

1. Pediatric age group (patients below 16 years of age).
2. Patients with no active bleeding at time of presentation and the following observation period.
3. Trauma patients.
4. Pregnant females.
5. Post-surgical bleeding.
6. Patients lost during follow up or discharging against medical advice.

Design of the study

Cross-sectional, descriptive study.

Methods

Upon presentation, all patients underwent primary survey (airway assessment, breathing, circulation, and conscious level assessment), vitals (pulse rate, respiratory rate, blood pressure and temperature) were assessed, a brief introduction of the treating personnel was done to the patient and/or relatives. Those who can obey the instructions, were instructed to pinch their noses in the sitting position, with the head bending forward (Hippocratic method), a short history was obtained, intravenous access was established for patients in need, a blood sample was taken for blood grouping and cross matching, and circulatory support with intravenous fluids was done if needed.

Preparations for initial examinations were made during this period; the treating team dressed with surgical gowns, gloves and headlight worn. All examination instruments were checked for availability and readiness for use. Consent was obtained from all patients and/or from their next-off kin for examination and management, verbal consent was considered sufficient for non-surgical interventions and a written one for surgical procedures.

The patients were seated on the ear, nose, and throat (ENT) examination chair with head supported. A more detailed history was obtained. Every procedure was explained. First the patient was asked to unpinch his/her nose, and anterior rhinoscopy done with the Killian's speculum accompanied by suction clearance of blood clots under good illumination, seeking for a bleeding point and any intranasal abnormalities. If an anterior bleeding point was identified and hemostasis sufficiently achieved by the prior Hippocratic method then the nose would be sprayed with 2% lidocaine solution for anesthetizing the nasal cavity, a waiting period of 2-5 minutes was undertaken, then silver nitrate (75-95%) cautery was done using Jobson's horn probe as an applicator.

If an anterior bleeding point was identified and still with active bleeding rendering silver nitrates cauterization ineffective then cauterization was done with bipolar electrical cauterization.

If no bleeding point was identified then after spraying the nose with the anesthetic solution, the nasal cavity was examined with a 4 mm 0 degrees Hopkin's rod with a camera system. If a posterior point of bleeding was identified then bipolar electrical cauterization was done using the electrical cauterization probe blades applied directly on the bleeding point, and electrical current application done (set at 25-50 degrees) until achieving control of bleeding.

Then the nose was examined and the oropharynx inspected using a Luc's metallic tongue depressor to exclude persistent bleeding. Afterwards more detailed history and more thorough examination was done. Findings are all recorded in a questionnaire forum. If the bleeding was controlled and the patient has no systemic disease then the patient was discharged home with instructions to use intranasal antibiotic ointment for ten days and a scheduled follow up visit was planned. Otherwise, medical consultations and managements were done accordingly.

If these measures fail to control the bleeding and/or if no bleeding point was identified even with endoscopic examination, then bilateral anterior nasal packing with glycerin impregnated ribbon gauze was done in layers through the whole length of the nasal cavities. Those patients were admitted to the otolaryngology ward and kept under antibiotic coverage and analgesia. Further questioning and more thorough examination done. Blood transfusion started for patients who needed it, and again, consultations were done accordingly.

Anterior nasal packings were kept in situ for at least 48 hours.

In cases of failure of anterior packing, insertion of a Folley's catheter was done, the tip of which was inspected in the oropharynx. The catheter would be inflated with 5-10 ml of distilled water, pulled gently securing the posterior choana, followed by the insertion of bilateral anterior nasal packing. The Folley's catheter was then clamped with an umbilical cord clamp against the anterior nares or fixed with adhesive plaster. Reexamination was done to check for any persistent bleeding. If the bleeding was controlled then the patient was admitted to the otolaryngology wards with further detailed questioning about any preexisting medical condition/anticoagulant use. Blood transfusion and medical consultations were done accordingly. Packing was also left in situ for 48 hours.

In failure cases, endoscopic examination under general anesthesia was done; posterior and anterior nasal packs were removed in the theater, suction clearance was done and a cotton wick soaked with 5% xylometazoline, kept for 5 minutes then removed, and a 4 mm 0 degrees Hopkin's rod introduced. If a bleeding point was recognized then bipolar electrical cauterization was done, and the patient was readmitted to the otolaryngology ward and kept on antibiotic coverage with analgesia and observation for 24 hours. But when no bleeding site could be identified then endoscopic ligation of the sphenopalatine artery was carried out: the middle turbinate of the bleeding side was mediatized with the Freer's dissector, and the crista ethmoidalis identified as a small pyramidal prominence in the middle meatus just inferior to the ethmoidal bulla. An incision would be made 5 mm anterior to it and a mucosal flap would be elevated with the Freer's dissector. The sphenopalatine artery was identified as a pedunculated structure attached between the mucosal flap and the lateral ethmoidal bone just anterior and slightly cephalic to the crista ethmoidalis alongside branches of the vidian nerve. Bipolar electrical cauterization was done to it.

Reassessment was done, patient was admitted, and further managements and consultations were carried out accordingly.

Those patients were kept under observation in the ward for at least 24 hours for monitoring and for any further medical interventions (like managing hypertension or elevated blood sugar for example).

For a selected group of patients especially in patients with recurrent attacks of epistaxis with spurs, septoplasty was done.

Patients' data were collected and grouped for statistical and analytical purposes.

Results

Age and gender distribution

Age ranged from 16 to 75 years with a mean of 53.81 years. Males were more predominant to females (63% vs 37%, M/F=1.68:1).
According to age, cases were distributed in four groups as shown in table (1). The largest group was those above (60) years old (52 patients, 44%), while the smallest group was those between (16-30) years old (12 patients, 10%). There was an increased incidence of epistaxis with increasing age (P = 0.002), 84 patients (71.2%) were older than 45 years.

Table 1. Distribution of sex according to age groups

	16-30 yr	31-45 yr	46-60 yr	>60 yr	Total
Male	8	12	18	36	74
Female	4	10	14	16	44
Total	12	22	32	52	118

Location of the bleeding
Sixty-eight patients (58%) had a bleeding point on the anterior septum, which represents the highest percentage. 10 patients with anterior bleeding point on the lateral wall of the nasal cavity (inferior turbinate), 20 patients had a posterior septal bleeding, 10 patients with a posterior bleeding point from the lateral nasal wall, 4 patients (3.3%) with bleeding originating from the nasal floor (posterior), which represents the lowest percentage, and 6 patients with an unidentified bleeding point.

Local (intranasal) pathologies
Initial nasal examination revealed these pathologies in the following frequencies: septal deviation 30 (25.4%), crustations in 4 cases (3.4%), local vascular dilatation in 8 cases (6.8%), septal perforation in 2 patient (1.7%), and in 72 (61%) patients no local pathology was detected. Only two of the patients in our series had a mass in the nasal cavity.

Systemic diseases
Twenty-eight patients (23.7%) had one systemic disease, 42 patients (35.6%) had multiple systemic diseases, and 48 patients (40.7%) had no systemic disease. Overall, there were 116 records of a systemic disease in the in the study sample; the most frequently encountered systemic disease was hypertension (50 records, 43%), followed by diabetes mellitus (26%), ischemic heart disease (12%), renal disease (9%), liver disease (4%), malignancy (3%), and the least was hereditary hemorrhagic telangiectasia (3%).

Anti-platelets/anticoagulants
Forty-eight patients (40.6%) used anti-platelets/anticoagulants. Aspirin was used by 34 patients (28.8%), 2 patient (1.7%) were on Warfarin, and 12 patients (10.2%) used Clopidogril (Plavix). The remainder 70 patients (59.3%) didn't use anti-platelets/anticoagulants.

Social habits
Twenty-eight patients (20.3%) were smokers, and 6 patients (5.1%) were alcoholics.

Etiology
Eighty-eight patients (74.6%) had an etiological factor, while 30 patients (25.4%) had no etiological factor.

Interventions
These interventions included silver nitrates cauterization in 78 instances (45%), electrical cauterization in 27 occasions (15.6%), 36 endoscopic assisted cauterizations (20.8%), 22 (12.7%) anterior nasal packing, 5 (2.9%) posterior nasal packing, septoplasty in 4

instances (2.3%), and endoscopic sphenopalatine artery ligation/cauterization done once (0.57%).

Two groups resulted according to the type of intervention that succeeded to control the bleeding: the non-surgical (silver nitrate cautery, electrical cautery, endoscopic assisted cauterization and anterior nasal packing), and the surgical group (posterior nasal packing, septoplasty and endoscopic sphenopalatine artery ligation). One hundred and nine patients (92.3%) underwent a non-surgical technique to control epistaxis while the rest 9 patients (7.6%) needed a surgical intervention. This is illustrated in table (2).

Table 2. Types of successful interventions that controlled epistaxis

Non-surgical interventions	No. of cases	Surgical interventions	No. of cases
Silver nitrates cauterization	51	Posterior nasal packing	4
Electrical cauterization	20	Septoplasty	4
Endoscopic cauterization	21	Endoscopic sphenopalatine artery ligation	1
Anterior nasal packing	17		
Total	109		9

According to the type of approach, two groups were noted: A direct (silver nitrate cauterization, electrical cauterization and endoscopic assisted cauterization) and an indirect (anterior nasal packing, posterior nasal packing, septoplasty and endoscopic sphenopalatine artery ligation (ESPAL)) approaches of epistaxis management: 92 patients (78%) underwent a direct approach, while 26 (22%) underwent an indirect approach. This is illustrated in table (3).

Table 3. Types of approaches that succeeded to control epistaxis

Direct approach	No. of cases	Indirect approach	No. of cases
Silver nitrates cauterization	51	Anterior packing	17
Electrical cauterization	20	Posterior packing	4
Endoscopic cauterization	21	Septoplasty	4
		ESPAL	1
Total	92		26

ESPAL: Endoscopic sphenopalatine artery ligation

Seventy-six patients (64.4%) responded to a single intervention, while 42 patients (35.6%) required multiple interventions, 173 total interventions were used in this study of which 55 (31.7%) had failed. Regarding the failure rates of the interventions, these are listed in table (4) from the highest failure rate to the lowest.

Table 4. Total, successful, failed and failure percentage of each intervention

Intervention	Total	Successful	Failed	Failure percentage
Endoscopic assisted cauterization	36	21	15	41.6%
Silver nitrates cauterization	78	51	27	34.7%
Electrical cauterization	27	20	7	25.9%
Anterior packing	22	17	5	22.7%
Posterior packing	5	4	1	20.0%
ESPAL	1	1	0	0.0%
septoplasty	4	4	0	0.0%
Grand total	173	118	55	31.7%

ESPAL: Endoscopic sphenopalatine artery ligation

Hospitalization

Eighty-eight patients (74.6%) were treated as out-patients, while 30 patients (25.4%) required hospital admission. Hospitalization could be categorized according to the type of approach used (direct and indirect approach); 88 patients with a direct approach were treated as out-patients and 4 were hospitalized. While all the 26 patients treated with an indirect approach were hospitalized. The type of approach used in managing epistaxis patient significantly influenced the chance of hospitalization, as the use of direct approach was strongly associated with lower hospitalizations than the use of an indirect approach (P <0.001).

Hospitalization ranged from 1 to 5 days with a median of 2 and a mean of 2.1 days. Distribution of days of hospitalization is illustrated in table (5).

The mean hospital stay for the non-operative group of patients is (1.8) days with a range of 1-2 days, while that of the surgical group is (2.9) days with a range of 1-5 days.

Table 5. Percentage of patients according to days of hospitalization

Days of hospitalization	Percentage of patients
One day	23.3%
Two days	60.0%
Three days	3.3%
Four days	10.0%
Five days	3.3%

Blood transfusion

Transfusion of blood was required in 26 patients (22%) during the course of treatment, while the remainder 92 patients representing (78%) of the total didn't need transfusion.

Discussion

Age and sex distribution

In the current study, the age distribution was somewhat consistent with the other studies. There was a significant increase in the incidence of epistaxis with increasing age, 84 (71.2%) patients of the 118 in the current study are older than 45 years. Current finding agree with Goddard and Reiter [6] who reviewed the records of 9778 patients with epistaxis; the mean age was 64.8 years, males composing 53.3% and females 46.7% of the sample. The male to female ratio was 1.14:1. Also, agree with Shaw et al. [7] who conducted a study on 65 patients with nose bleeds, their mean age of 62 years and male to female ratio was 1.8:1.

Likewise with Supriya et al. [8] who studied 100 patients with epistaxis: their mean age was 68.5 years and male to female ratio was 1.13:1. Regarding sex distribution, the percentage of males with epistaxis was found to be higher than females, which was also similar to the aforementioned studies. This may be due to the effects of male hormones

Location of the bleeding

Varshney and Saxena [4] reported the location of bleeding as follows: anterior septum 40.91%, posterior septum 15.91%, lateral wall inferior turbinate 13.64%, middle turbinate 12.5%, floor anterior 25%, floor posterior 4.55% in addition to 11 of the 88 cases had bilateral bleeding (multiple bleeding locations). Supriya et al. [8] reported 53% anterior septal, 27% posterior septal, 11% posterior lateral and 9% with an unidentified bleeding site.

The above figures align with the current study, an exception is in figures from Varshney and Saxena [4] where higher numbers of lateral nasal bleeding were observed, that might be because Varshney and Saxena [4] included traumatic epistaxis in their study, while traumatic patients were excluded from this study.

Local (intranasal) pathology

An intranasal abnormality was seen in 39% of patients. Those abnormalities included nasal septal deviation, local vascular dilatation, dryness and crustations, septal perforations and a tumor. Some authors suggested a correlation between septal deviation and epistaxis [2] while others [1] did not mention a deviated nasal septum to be correlated with nose bleeds.

Systemic diseases

Goddard and Reiter [6] plotted the systemic disease in their series as the following percentages: hypertension (45.4%), diabetes mellitus (9.7%), and ischemic heart disease (14.6%). Pollice and Yoder [9] estimated the presence of systemic diseases as follows: hypertension (43%), diabetes mellitus (11.6%), liver disease (4%), renal disease (4%), and collagen vascular disease (2.8%). The incidence of hypertension in present study well correlated to its incidence in other studies. But regarding other systemic conditions, each individual study had different figures from its sibling studies, and that's also the case with this study.

Use of anticoagulants

More than 40% of patients in this study were on an anticoagulant. Pollice and Yoder [9] estimated that 33% of their epistaxis patients were on anticoagulants. Herkner et al. [10] reported only 25%, and Goddard and Reiter [6] stated that 13% of patients with epistaxis were taking anticoagulants. Although the use of anticoagulants is a well-recognized risk factor for epistaxis [1,2], Herkner et al. [10] had did not find a correlation between use of anticoagulants with nose bleeding.

Social habits

The incidence of tobacco and alcohol abuse in the current study was 20% and 5% respectively. Varshney and Saxena [4] estimated the percentage of smokers in epistaxis patients to be (26%), while alcoholics were 27%. Pollice and Yoder [9] had similar results for smokers and alcoholics being 27% and 27% respectively. Shaw et al. [7] reported a total incidence of smoking of 40%, and that of alcoholism being 15%, while Fuchs et al. [11] reported smokers in the epistaxis arm to be of 37.6% and alcoholics of 8.7%. In this study though, the observation was that we had lower tobacco and alcohol abuse. This is probably related to social and religious factors.

Etiology

In this study, 75% of patients had a predisposing factor, and the remainder 25% fall into the idiopathic type. Many authors stated that the majority of cases of epistaxis are idiopathic in nature [1,2], with the total percentages of idiopathic epistaxis ranging from 70 to 80% [1]. However, in more recent studies, the percentage of a diagnosis of an idiopathic epistaxis is declining. Kotecha et al. [12] reported 38.69% idiopathic epistaxis. Similarly, Varshney and Saxena [4] estimated it to be 35.23%. This decrease in the percentage

of idiopathic epistaxis is probably due to the advancement of more sophisticated diagnostic tools, namely the examination endoscope.

Interventions

In this study, a step-wise approach was used to treat epistaxis [1], that is: treatment was started with the simplest of all; silver nitrates cauterization, whenever possible. If this fails, or was unfeasible, a more aggressive approach was used, that is electrical cauterization. The endoscope was utilized accordingly depending on the location of the bleeding. If those initial interventions fail or were inapplicable, a more aggressive approach was used. That explains the higher number of interventions used (173) compared with the number of patients (118), as 42 patients required two or more interventions.

Epistaxis was successfully managed non-surgically in (92.3%) of the cases. This is higher than the data from Pollice and Yoder [9], Shaw et al. [7], and Varshney and Saxena [4] studies, being (83%), (78%) and (70.45%) respectively.

A comparison could be made between the treatment modalities used in the current study with those published by Pollice and Yoder [9] and Kotecha et al [12]; as Pollice and Yoder [9] reported that local cauterization represented (6.6%) of all used modalities, endoscopic assisted cauterization (7.6%), anterior packing (49.7%), posterior packing (25.5%), septoplasty (1%), and arterial ligation represented (0.7%) of all interventions. While Kotecha et al. [12] reported that silver nitrates cauterization was used in (21.7%) of all instances, electrical cauterization (2.4%), anterior packing (65.3%), posterior packing (8.3%), septoplasty (1.6%), and arterial ligation represented (0.7%) of all treatment modalities.

It is noted from the results above that, in this study, local cauterization (both silver nitrates and electrical) was used in (60.6%) of times collectively, which is higher than that of Kotecha et al. [12] and far exceeds that of Pollice and Yoder [9]. This huge difference in the use of local cauterization between the current study and previous mentioned two studies is probably due to the incremental approach used in this study, and the higher percentage of posterior epistaxis in Pollice and Yoder's study (44% vs 29% in this study), rendering local cauterization impractical.

It can also be noted that endoscopic assisted cauterization was used almost three times as often of that in Pollice and Yoder [9], which may reflect a trend for direct control of the bleeding in the current study.

It is also noticeable that the frequency of use of anterior nasal packing is less than that in the other studies, probably due to the graduated approach used in this study, and the use of posterior nasal packing in Pollice and Yoder [9] is much higher than that used in the current study and in Kotecha et al. [12]. this again is probably due to the high percentage of posterior bleedings in their study.

Septoplasty was done in 4 patients; those met the criteria of using septoplasty to control epistaxis. These criteria included recurrent nose bleeds in patients with septal deviation/spur without an additional local or a systemic factor for epistaxis. This represented (2.3%) of the total interventions, which aligned with the other two studies.

As for arterial ligation, endoscopic sphenopalatine artery ligation (ESPAL) was used in one case with recurrent epistaxis leading to hemodynamic instability and no identifiable/correctable local or systemic cause for epistaxis. This corresponds to (0.8%) of the total sample size. This aligned well with the other two studies.

The literature [1] lists a percentage of (80%) for the success of endoscopic examination to localize the bleeding point in epistaxis patients, with around (90%) chance of successfully cauterizing it with endoscopic assistance. This means an overall success of (72%) of the endoscopic assisted cauterization in controlling epistaxis, which hence means a (28%) chance of failure. In the current study however, a higher figure of failure of (41.6%) was noticed. This was due to heavy bleeding rendering visibility of the scope difficult in 9 patients out of 36, and patient intolerance of the procedure in 6 out of 36.

McGarry [13] listed a failure rate of 8.3% of endoscopic assisted cauterization. Silver nitrates cauterization was used in 78 patients

with anterior epistaxis and it failed to control the bleeding in 27 patients. It's the most frequently used intervention in this study. In spite of high failure rate (34.7%), it is cost effective, available, the least irritant and the least technically demanding method of stopping anterior epistaxis. Razdan et al. [14] reported a 27.3% failure rate of silver nitrates cauterization, and Toner and Wably [15] reported it to be 29.6%.

Anterior nasal packing had a failure rate of (22.7%). mainly because of posterior bleeding points, necessitating posterior nasal packing. The combined use of anterior and posterior nasal packing however failed once (20%). That's why it may be considered the most reliable method in controlling epistaxis without the need of a general anesthetic, in spite of patient discomfort and the need for hospitalization, analgesics and antibiotics to decrease the risk of toxic shock syndrome. Razdan et al. [14] reported a 16% failure rate of anterior packing, and 4% rate of failure of posterior packing. Schaitkin et al. [16] reported a combined failure rate of packing of 52%.

Bipolar electrical cauterization was used in 27 patients with a failure rate of (25.9%) in controlling anterior epistaxis in an outpatient basis. Discomfort was the main drawback. Toner and Wably [15] reported a failure rate of electrical cauterization of 23%.

Septoplasty succeeded to control epistaxis, but it can only be used in a selected group of patients with recurrent epistaxis originating from the septum and associated with septal deviation/spur.

Endoscopic sphenopalatine artery ligation/cauterization was done in one patient. It succeeded in controlling epistaxis in a patient with recurrent posterior epistaxis in whom posterior packing failed. Razdan et al. [14] reported a failure rate of arterial ligation of 0%, Schaitkin et al. [16] reported a failure rate of 12%, and Pollice and Yoder [9] reported 3 cases requiring arterial ligation, with one of them failing (33%) requiring an embolization procedure.

Hospitalization

The use of direct therapy to control epistaxis (silver nitrates cauterization, electrical cauterization and endoscopic assisted cauterization) was significantly associated with lower hospitalization, and resulted in (75%) of patients to be able to leave the hospital at the same day of presentation with no need for admission in the ENT wards. This advocates the use of direct therapy to control nose bleeds whenever possible to minimize the burden of hospital admissions on both patients and medical staff. The mean hospital stay in the current study was (2.1) days with a range of 1 to 5 days. It was the least compared with Varshney and Saxena [4] and Pollice and Yoder [9] (3.2 days and 4 days respectively). This is probably due to the inclusion of trauma patients in their studies who needed longer hospitalization.

While Shaw et al. [7] revealed a significant difference of 5 days of hospitalization in the non-surgically treated patients in comparison to those treated surgically, being 3.27 days versus 8.22 days, the current study failed to show a significant difference between the two groups; being 1.8 days for the non-surgically treated versus 2.9 days for the surgically treated patients. Indicating that the type of treatment does not significantly impact the length of hospital stay.

Blood transfusion

The decision for blood transfusion depended on the degree of hemodynamic instability on admission and the days of hospitalization that followed, and on the hemoglobin levels of each individual patient obtained either at presentation or during the hospitalization period. It was done for all patients with class III or IV hemorrhagic shock - low blood pressure (100/60 mmHg or lower) and high pulse rate (120 or more) [17], or a hemoglobin level of 7 g/dl or less.

The current study listed a 22% need for a blood transfusion. Kotecha et al. [12] and Goddard and Reiter [6] reported a lower need for transfusion (4.7% and 10.3% respectively). Pollice and Yoder [9] reported a (23%) need for blood transfusion, almost similar to the results obtained in this study. Shaw et al. [7] reported a higher need (38%) for blood transfusion.

This study concluded:

1. Non traumatic epistaxis affects adults in all age groups, with a significant male predominance. The incidence increases with age.
2. The bleeding point in epistaxis can be located anywhere inside the nasal cavity, with the anterior septum being significantly more implicated in nose bleeds, and in all patients with epistaxis, an intranasal pathology should be looked for and excluded.
3. Most cases of non-traumatic adult epistaxis are secondary in nature, so a thorough assessment is mandatory.
4. The best approach for managing epistaxis is a graduated one (using simple methods first and escalate when necessary). The use of a direct approach for managing epistaxis patients is associated with significantly lower hospital admissions, reducing the burden of hospitalization on patients and medical staff.
5. There is no significant difference in the mean duration of hospital stay between admitted epistaxis patients that are treated non surgically and those treated surgically.
6. Although endoscopic assisted cauterization had the most failures in controlling epistaxis, its use is still warranted as it is regarded as a direct approach method of management which significantly decreases hospital stay whenever successful.

The current study recommended:

1. Further studies are needed to study the correlations of local and systemic abnormalities with epistaxis.
2. The use of a direct approach to control epistaxis is warranted whenever possible.
3. Equipment needed for the direct approach should be provided and made accessible 24/7 in every otolaryngology department.

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Author contribution

Dr. Kadhim put the research plan. Dr. Saeed collected the data, did the statistical analyses, and wrote the manuscript. Both authors supervised patients' treatments and follow up, and both of them revised and approved the final version of the manuscript that was submitted.

Conflict of interest

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