# Efficacy of Different Treatment Modalities Used in Epistaxis

**Hiwa As'ad Abdul-Kareem** *FICMS; CABS (ENT*).

## *Abstract*

***Background:*** This is a cross-sectional, clinical study, implemented in the Department of Otolaryngology / Sulaimani Teaching Hospital; from July 15th 2004 to April 15th 2005.

***Objectives:*** The aim of the study is to describe the demographic characteristics, aetiological factors and therapeutic measures for epistaxis in Sulaimani region, to improve our experience in the management of this common condition.

***Methods:*** This study included 100 patients of different age and sex who attended ENT department during the period of the study.

***Results:*** At the end of the study we found that most cases of epistaxis can be treated by simple measures like application of lubricants to nose, or cauterization and anterior packing.

***Conclusion:*** Active intervention should be done when indicated.

***Keywords:*** epistaxis, lubricants, cauterization, anterior packing, active intervention**.**

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## *Introduction*

Epistaxis is a common disorder, with most people having experienced one or more episodes in their lifetime. Some estimates suggest that as many as 60% of the population may have suffered from epistaxis at some point in their lifetime, current available data suggests that only approximately 10% of patients seek medical attention for nosebleeds [1, 2]. It occurs in persons of all ages without predilection for sex [3]. Minor recurring nosebleeds are usually caused when the mucosa of the anterior nasal septum becomes compromised as a result of one or more factors. One key factor is a dry external climate or dryness caused by the lack of humidity when heating in the winter. Dryness can also be caused by various medications such as antihistamines and diuretics. These nosebleeds tend to be minor and are relatively easily managed with pressure or stop spontaneously.

**Dept. Surgery /ENT, Teaching Hospital, College of Medicine, University of Sulaimani.**
**Address Correspondence to: Dr. Hiwa As'ad Abdul Kareem**
**E- mail: hiwa_ent@yahoo.com**
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Only a small percentage requires consultation with an otolaryngologist to control the bleeding, suggesting that otolaryngologists see only 0.5% to 1% of the total population who experience nosebleeds [4]. On occasion, however, epistaxis can be quite difficult to manage. This is particularly true in patients who have hypertension, are on anticoagulants or aspirin, or have a familial history of a bleeding disorder such as hemophilia, or have a blood disease like leukemia [4].

The upper parts of the nose are supplied by branches from internal carotid artery (anterior and posterior ethmoidal arteries) and the rest from branches of the external carotid artery (greater palatine, sphenopalatine and superior labial artery which is a branch of facial artery) [5]. In the caudal end of the septum the branches of the two systems anastomose forming Kiesselbach's plexus. The middle turbinate is regarded as the dividing line between the internal and external carotid distributions. Retrocollumelar vein also runs at the caudal end of the septum which sometimes may reveals a tiny area of local ballooning, and this could possibly signify an area of vessel wall weakening which easily bleeds,

perhaps as a result of localized ischaemia and/or trauma [6].

The most common source of bleeding (in about 90% of cases) is Kiesselbach's plexus on the anterior portion of the septum (Little's area), retrocollumelar vein at the caudal edge of the septum is also a frequent site of bleeding in young persons [7], the mucosa in the anterior portion of the septum is very fragile and is tightly adherent to the underlying cartilage, and thus offers little resistance to mechanical or functional stress, so easily irritated via nose picking, cold dry air, cigarette smoking, etc. [8].

The etiological factors for epistaxis include idiopathic, trauma, upper respiratory tract infections, tumors, iatrogenic and disorders of blood vessels and clotting mechanisms [9].

Epistaxis remains a common problem treated by otolaryngologists. Although most cases are managed on an outpatient basis, some require hospitalization for more invasive treatments. Nasal packing is used commonly for epistaxis that requires inpatient management [10]. Sometimes an anteriorly-placed bleeding point is visible with a head mirror and may be easily cauterized; also direct cauterization under endoscopic control appears to be an effective treatment of posterior epistaxis [11]. The elderly population with their associated morbidity often requires more intensive treatment and subsequent admission [12].

**Patients and methods**

One hundred patients included in this study were consecutively seen in the ENT department at Suleimany Teaching Hospital over a 10 months period from July, 15th 2004 to April, 15th 2005.

A careful history was taken from every patient (or his/her parents or relatives), then a thorough ENT examination was done to locate the bleeding site and to find out any possible anatomical or pathological abnormalities in the nasal cavity.

In active bleeding an attempt was made to arrest the bleeding by local pressure and cautery if necessary, if this failed anterior packing was performed, if failed too then anterior and posterior packing was done. If the bleeding point was inactive then applications of lubricants (in form of gentamicin eye ointment) and/or cautery of the dilated vessels were tried. Admission and blood transfusion was done if clinically indicated.

Any relevant medical illness was treated, like hypertension. The laboratory tests which were done include the hemoglobin level and platelets count, however, when the diagnosis was unclear after history and physical examination, further tests were done like PT, PTT, CT and BT. Sinus X-ray film and X-ray of nasal bones were useful adjuncts if one is considering local trauma, or acute sinusitis. Additional blood investigations, like complete blood picture and blood film, renal and liver function tests were done in indicated cases.

**Results**

The highest proportion of epistaxis was among individuals less than twenty years of age 50 cases (50%). Sixty three (63%) males were affected as compared to thirty seven (37%) females, giving a male: female ratio of 1.7:1, as shown in figure 1.

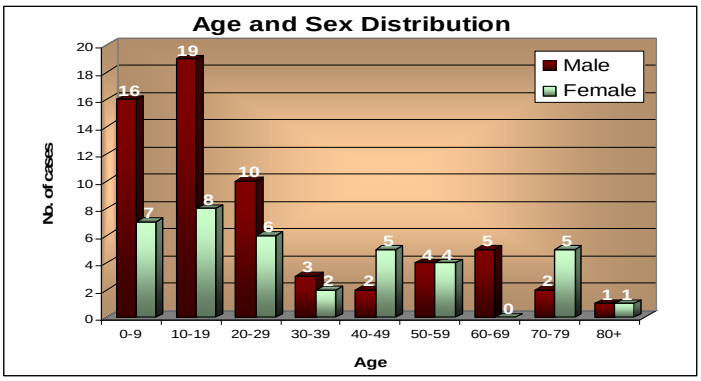


**Figure 1: Showing the age and sex distribution.**

Eighty patients (80%) were urban inhabitants whereas rural inhabitants were only 20 (20%), as shown in figure 2.

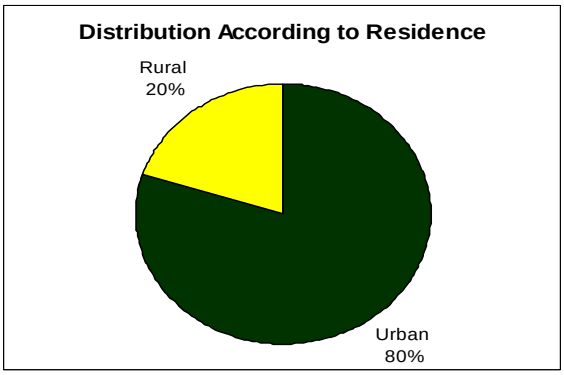


**Figure 2: Showing distribution of patients according to residence.**

Out of hundred patients who were studied, 59 patients (59%) had active bleeding at the time of examination, as shown in table 1.

**Table 1: Showing types of bleeding.**

| Type of bleeding | No. of cases | % |
|---|---|---|
| **Active** | 59 | 59 |
| **Inactive** | 41 | 41 |
| **Total** | 100 | 100 |

Eleven patients (11%) were smokers, five cases (5%) were alcoholics, and the rest were none (84%), as shown in figure 4.

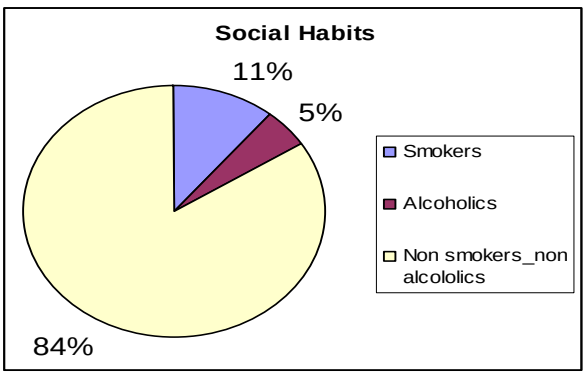


**Figure 3: Showing relation of social habits with epistaxis.**

Among the local causes, idiopathic group was the commonest (43%), followed by inflammatory causes (30%) and trauma (23%).

Among the general causes; one case had hemophilia and another case was on anticoagulants (Warfarrin).

Only one case of neoplasm (squamous cell carcinoma of the nose and paranasal sinuses) was presented with epistaxis.

One case of chronic renal failure (Uraemia) was presented with epistaxis; the above results are shown in figures (4 and5).

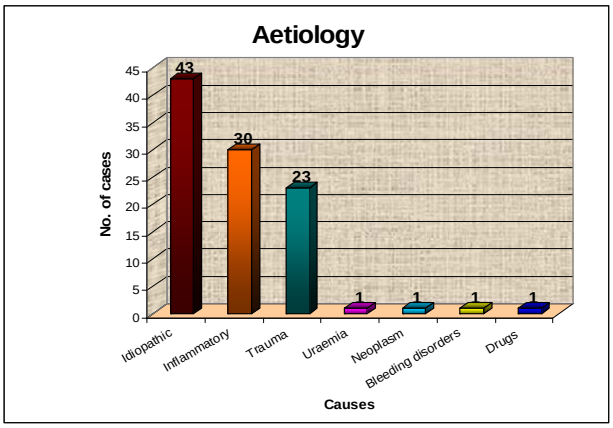


**Figure 4: Showing the aetiological factors for epistaxis.**

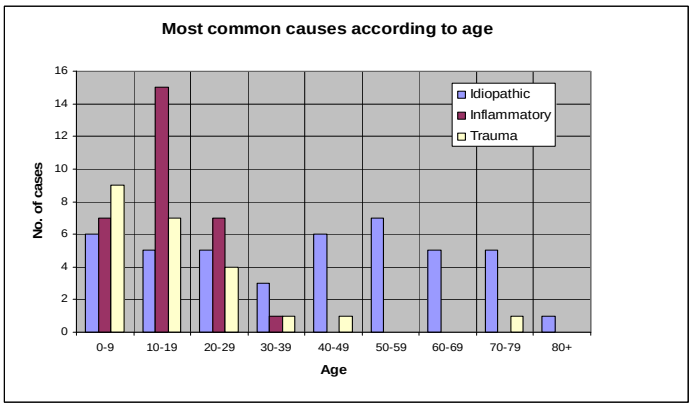


**Figure 5: Showing the frequency of most common causes according to age.**

The most common traumatic cause was nose picking in 12 cases out 23 cases (52%), followed by accidental trauma in 9 cases (39%), and while surgical trauma was reported in only 2 cases (9%), as shown in figure 6.

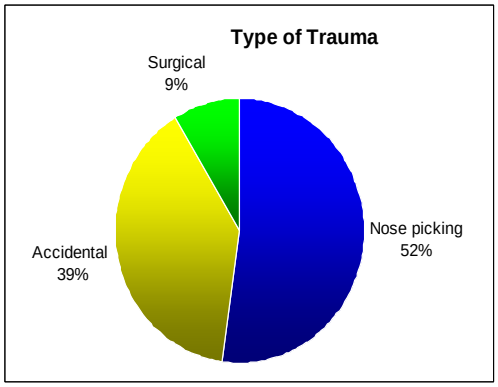


**Figure 6: Showing the frequency of traumatic causes of epistaxis.**

The bleeding was arising from the right nasal cavity in 48 cases (48%) and from the left in 41 cases (%41), while in 11 cases (11%) was bilateral, as shown in table 2.

**Table 2: Showing the distribution of the side of bleeding.**

| Side of Bleeding | No. of cases | % |
|---|---|---|
| **Right** | 48 | 48 |
| **Left** | 41 | 41 |
| **Bilateral** | 11 | 11 |
| **Total** | 100 | 100 |

Anterior septum was the commonest site of bleeding (75%). The site of bleeding was not detected in 13 cases (13%), as shown in figure 7.

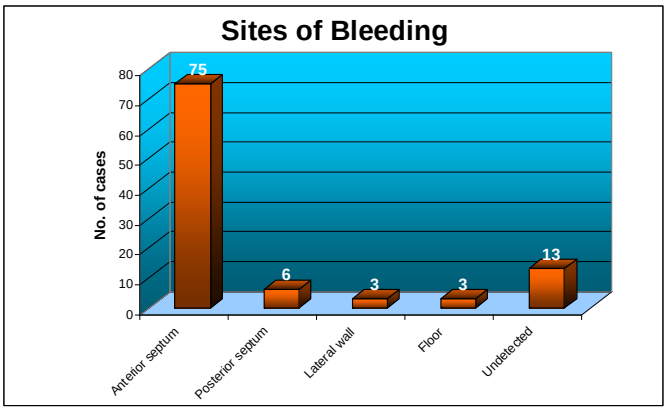


**Figure 7: Showing sites of bleeding.**

The Little's area was the commonest site of bleeding from anterior septum (67 out of 75 cases , 89.33%), in 4 cases (5.33%) the source of bleeding was from the retrocollumelar vein, and in the rest (4 cases , 5.33%) other sites were detected, as shown in figure 8.

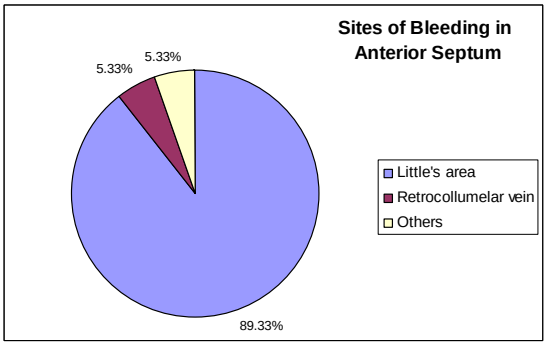


**Figure 8: Showing the sites of bleeding in anterior septum.**

Fifty five percent of cases had at least one previous attack, as shown in figure 9.

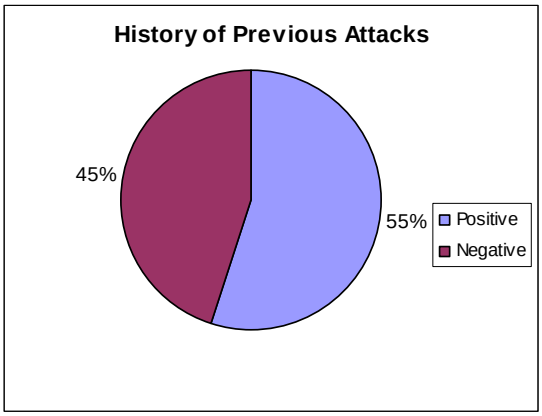


**Figure 9: Showing history of previous attacks.**

An associated systemic illnesses was present in 20 cases (20%), among them 12 cases had hypertension, as shown in table 3.

**Table 3: Showing the frequency of associated systemic illnesses.**

| Associated systemic illnesses | No. | % |
|---|---|---|
| **Hypertension** | 12 | 12 |
| **Diabetes mellitus** | 2 | 2 |
| **Hemophilia** | 1 | 1 |
| **Uraemia** | 1 | 1 |
| **Ischaemic heart disease** | 1 | 1 |
| **Ventricular septal defect** | 1 | 1 |
| **Asthma** | 1 | 1 |
| **Rheumatic fever** | 1 | 1 |
| **Total** | 20 | 20 |

The haematological investigations and radiological examinations were performed in indicated cases and the results are shown in table 4.

**Table 4: showing positive findings in investigations**

| Investigation | No. of cases | % |
|---|---|---|
| **Hb<10** | 5 | 5 |
| **Leukocytosis** | 7 | 7 |
| **Thrombocytopenia** | 3 | 3 |
| **X- ray showing fractured nasal bones** | 6 | 6 |
| **X- ray showing acute sinusitis** | 1 | 1 |
| **CT scan showing a mass of the nose and paranasal sinuses** | 1 | 1 |

Most of the cases were managed by cauterization of the bleeding point (61 cases, 61%), the second treatment in frequency was anterior packing (19 cases, 19%), while lubricants in form of gentamicin eye ointment were applied to the Little's area in 16 cases (16%).

Only Three cases needed posterior packing, and one case

underwent submucous resection of the septum to remove a spur which was the site recurrent refractory bleeding inaccessible to cautery, as shown in figure 10, and table 5.

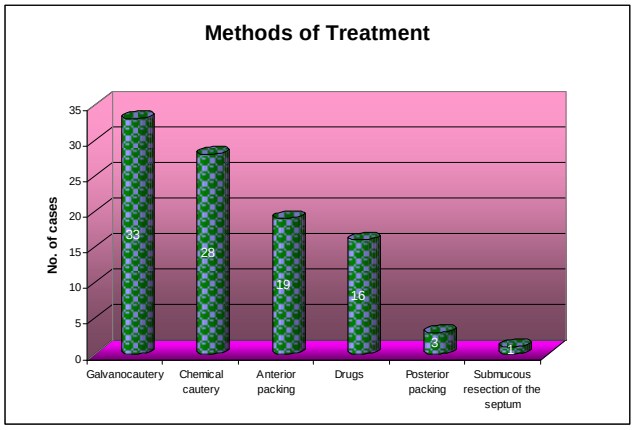


**Figure 10: Showing frequency of different methods of treatment.**

There is no statically significant difference between the two methods of cauterization regarding efficacy.

**Table 5: Showing the outcome of different methods of treatment**.

| Outcome / Method | Success | | Failure | | Total | | Chi-square | P Value |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | | |
| **Galvanocautery** | 27 | 81.82 | 6 | 18.18 | 33 | 33 | 1.5920 | 0.2070 |
| **Chemical Cautery** | 19 | 67.86 | 9 | 32.14 | 28 | 28 | | |
| **Anterior Packing** | 16 | 84.21 | 3 | 15.79 | 19 | 19 | | |
| **Drugs** | 10 | 62.5 | 6 | 37.5 | 16 | 16 | | |
| **Posterior packing** | 3 | 100 | - | - | 3 | 3 | | |
| **Submucous resection of the septum** | 1 | 100 | - | - | 1 | 1 | | |

P value > 0.05,

Only ten cases (10%) were admitted, and four of them had received blood (one Pint for each)in addition to intravenous fluid.

**Table 6: Showing number of admitted cases and method of resuscitation.**

| Admitted cases | Resuscitation | | | |
|---|---|---|---|---|
| | Blood Transfusion | | Intravenous Fluid Infusion | |
| | No. | % | No. | % |
| 10 | 4 | 4 | 10 | 10 |

The main complications of treatment was seen with the two method of cauterization, specially pain with galvanocautery in 5 cases (15.15% of total cases treated by galvanocautery), and staining of the

area reported in 4 cases out of 28 cases (14.28%) with chemical cautery, only on case of acute sinusitis was complicating anterior packing (5.25%), while one case of acute otitis media was reported with posterior packing (33.33%), treatment by drugs and surgery was not followed by any complication, as shown in table 7.

**Table 7: Showing complications of treatment.**

| **complication**<br><br>**Method** | **Pain** | **Temporary staining of vestibule and external nose** | **Acute sinusitis** | **Acute otitis Media** | **Total** | **%** | **chi-square** | **P value** |
|---|---|---|---|---|---|---|---|---|
| **Galvanocautery** | 5 | - | - | - | 33 | 15.15 | 0.0580 | 0.8100 |
| **Chemical cautery** | 1 | 4 | - | - | 28 | 17.85 | | |
| **Anterior packing** | - | - | 1 | - | 19 | 5.25 | | |
| **Drugs** | - | - | - | - | 16 | - | | |
| **Posterior packing** | - | - | - | 1 | 3 | 33.33 | | |
| **Submucous resection of the septum** | - | - | - | - | 1 | - | | |

P value > 0.05 so the difference between the two methods of cauterization is not significant statistically regarding complications.

***Discussion***

The occurence of epistaxis in our study was most common in the first two decades of life forming 50% of cases (*Figure 1*); this could be explained by more frequent upper respiratory tract infections and a more susceptibility to trauma in this age group. This rate was 43% in the study of Nafi and others in Mousil [13]. The male to female ratio was 1.7:1, which may be attributed to a more liability of trauma in males; another possible explanation is that the female pre-menopausal state may provide a significant protection from epistaxis, the mechanism for this is unknown, but may be secondary to a direct effect of oestrogen on the nasal mucosa or vasculature, this was stated by Tomkinson who showed a significant male predominance (1.6:1) in his study in Wales [14].

Eighty cases (80%) were urban inhabitants while rural's were only 20 cases (20%) (*Figure 2*), this difference may be due to tendency of applying self-treating measures in minor bleeding attacks in areas far from health facilities, or are managed in their local health centers, air pollution in urban areas also contributes to this difference in distribution.

Epistaxis showed higher proportion in winter months (34 cases, 34%), this can be explained by a high incidence of upper respiratory tract infections in winter, also cold dry air in winter months or dryness due to effect of heating all lead to dehydration of the nasal mucosa and subsequent erosion of superficial vessels. Schonweiler conclude from his study on relation of epistaxis to the weather that it is most often occurs between September and March [15]. Other studies in Greece [16] and in Boston [17] showed also an increase in occurrence in winter.

The bleeding was active in 59 cases (59%), and in the rest was inactive (*Table 1*). Those cases who were smokers were only 11 cases (11%), while alcoholics were 5 cases (5%), and the rest were non smokers-non alcoholics (84 cases, 84%) (*Figure 4*), and that is because the majority of our patients were children and adolescents (*Figure 1*).

In the present study the cause of epistaxis was similar to other study reported in Santiago by Vaamonde and others [18]. While in that of Basrah ([19], the traumatic causes was next in frequency to idiopathic group and the inflammatory causes was third. Nose picking was the commonest traumatic causes and was accounted for 52% of all cases with trauma (*Figure* 6) this difference is because of a higher rates of upper respiratory tract infection in our governorate and this inflammation makes nasal mucosa more liable to be injured even by minor trauma, some studies showed even a higher percentage (75% by Razdan) [20].

Localization of the site of bleeding is of utmost importance for subsequent management. In this study we found that in majority of cases the bleeding site was from the anterior part of the septum (75 cases-75%) (*Figure* 7) because this area is more near to the outside and rich in blood supply making it more vulnerable to have epistaxis, of which the Little's area was the commonest site (67 out of 75 cases with anterior epistaxis - 89.33%) (*Figure* 8) because of higher vascularization, the retrocollumelar vein was the source of bleeding in only 4 cases (5.33% of cases with anterior epistaxis) since it causes bleeding when it is dilated. Bleeding from posterior part of the septum was detected in 6 (6%) cases due to its location deep in the nasal cavity making it more protected(4 of them were hypertensive), the lateral wall bleeding occurred in 3 cases (3%) with trauma, and in 3 cases (3%) the bleeding was from the floor. Those cases with undetected site of bleeding were 13 cases (13%) (*Figure* 7). Similar results were reported by Nafi et al in their study in Mosil [13].

Fifty-five cases (55%) had had a similar previous attack indicating persistence of etiological and predisposing factors in these poepole. Most common systemic disease associated with epistaxis was hypertension (12%) (*Table 3*) because of atherosclerosis that makes the blood vessel fragile and looses contractility leading to severe epistaxis sometimes even by simple truama.Similar results was reported by Al-Robaee et.al in Basrah [19].

Regarding investigations, Haemoglobin level was below 10 gm/dl in only 5 cases (5%) and 4 of them had received blood due to recurrent or severe bleeding. Leukocytosis was detected in 7 cases (7%) due to infection and thrombocytopenia in 3 cases (3%) caused by systemic disease. X-ray showed nasal bone fractures in 6 cases (6%) due to severe trauma enough to cause fractured nasal bone, and acute sinusitis in only one case (1%), while CT scan was done in only one case (1%) whom was suspected to have a tumor by his age and clinical presentation and showed a mass in the nose and paranasal sinuses (*Table 4*).

The most used way for treatment was cautery which was applied in 61 cases (61%) with success rate of 75.41% because it was applicable, rapid and effective in controlling the bleeding in most of our patients, chemical cautery was performed for those with inactive bleeding with small vessels in the site of bleeding while galvanocautery for those with active one with larger bleeding vessels in the site of bleeding. The study showed no

statistically significant difference between the two methods of cautery regarding the results (*Table 5)* and complications (*Table 7*) because we have done the procedure according to indication and the need of each patient. The second treatment in frequency was the use of lubricants in form of gentamicin eye ointment by local application for one month which was used in 16 cases (16%) with success rate of 62.5%; it was mainly used in children with inflammatory causes for the bleeding. Anterior packing was used in 19 cases (19%) with success rate of 84.21% due to failure of previous method or being non-appllicable due to severity of bleeding or the bleeding site was not identified. In 3 cases (3%) all the above methods failed to control bleeding and we proceeded to do posterior packing which allowed application of a better anterior pack in addition to packing of more area, of which one of them was done under general anaehtesia . In one case (1%) the bleeding site was a septal spur in which lubricants and cautery failed to resolve the problem, so we were obliged to do submucous resection of the septum under general anaethesia to remove the spur and get axis to bleeding site and the resultant pibrosis also helped to stop bleeding(*Table 5, Figure 10*).

Only 10 cases (10%) were admitted and resuscitated by blood transfusion (4 cases), and intravenous fluid infusion (6 cases). Two cases of all were received general anaethesia (one for posterior packing and the other for submucous resection of the septum), and the rest were done under local anaethesia depending on the condition of each individual patient and his need for specific treatment.

The main complication of treatment was pain in 6 cases with cauterization, especially with galvanocautery (5 cases -15.15% of total cases treated by galvanocautery) due to more depth and area of cauterization by galvanocautery compared to chemical cautery, while in those who underwent chemical cautery, only one case developed pain and in 4 cases the external nose and vestibule were stained by the chemical agent due to its ability to spread which was temporary and disappeared after few days (complications of chemical cautery was 17.85% of total cases treated with that method). Only one case with anterior packing was complicated by acute sinusitis (5.25% of total treated with anterior packing) due to nasal obstruction and impaired ventilation of the sinuses, and an acute otitis media was reported in one case with posterior packing (33.33% of total posterior packing) (*Table 7*) due to of obstruction of a posteriorly located Eustachian tube. No complications were reported in this study with the other two methods of treatment (drugs and surgery) (*Table 7*).

In the study of Razdan and others ([21]) in India on 300 patient's cautery was done in 74% of cases with a success rate of 72.6%, while anterior nasal packing was used in 39% with a success rate of 83.5%, posterior packing was only performed in 7.6% of cases with a success rate of 95.6%. Two (1.1%) patients with anterior packing developed complications in the form of fever and a picture like toxic shock syndrome while 10 (8.5%) patients developed facial oedema. Acute otitis media in patients with anterior packing was noted in 2 (1.1%) patients. One (4.5%) patient with posterior packing showed acute otitis media.

Local non-operative measures control majority of cases with minimum complications, but active intervention should be done when indicated.

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