Original Article

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# Outcome of Silver Nitrate Cauterization in Controlling Anterior Epistaxis in Children

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## ABSTRACT

**Objective:** To assess the outcome of silver nitrate cauterization in controlling unilateral spontaneous anterior epistaxis in children in terms of success on initial attempt and complications like recurrence of bleeding, pain, infection, exposure of septal cartilage, septal perforation and stenosis of the nostrils.

**Study Design:** Cross-Sectional Descriptive

**Place and Duration of Study:** This study was conducted at Department of ENT, Mufti Mehmood Memorial Teaching Hospital, D.I.Khan, from October 2010 to September 2012.

**Materials and Methods:** All patients having ages between 6-16 years with spontaneous unilateral anterior epistaxis were included in the study. Patients with bilateral anterior epistaxis, posterior epistaxis, post-traumatic epistaxis, and epistaxis due to bleeding diathesis or neoplastic lesions were excluded. Patients were managed by silver nitrate cauterization after packing the nose with ribbon gauze soaked in 4% lidocaine and adrenaline 1:1,000 in equal amounts for 5-10 minutes. Furacin antibiotic ointment was applied to the cauterized area and was continued two times daily for two weeks. All patients were reviewed fortnightly for six weeks.

**Results:** Mean age of the patients was 10.43±3.23 years with 49 (65.35%) males and 26 (34.65%) females. Silver nitrate cauterization was successful on initial attempt in 69 (92%) patients. Recurrence of bleeding, infection and exposure of septal cartilage were noted in 7 (9.35%), 2 (2.65%) and 1 (1.33%) cases respectively.

**Conclusions:** The increased success rate and decreased post procedure morbidity associated with silver nitrate cauterization make it an effective and safe procedure for managing spontaneous unilateral anterior epistaxis in children.

**Key Words:** Unilateral Epistaxis, Silver nitrate, Children.

## INTRODUCTION

Epistaxis is a common ENT problem. Most epistaxis patients can be managed in a non-interventional manner. Interventional treatment is warranted when bleeding is continued after adequate conservative treatment or when bleeding is massive and severe. The general incidence from most reports from Europe and USA is about 10%-15% of the population. Although epistaxis may occur at any age and in any season, it is a common complaint in the pediatric age group and the winter months.[1] There are two main types of epistaxis, anterior and posterior, depending upon the site of bleeding. Anterior epistaxis is more common than posterior one, being responsible for about 80% of total epistaxis cases.[3,4] Epstaxis may be idiopathic or pathological. It may be caused by a local disorder within the nose and paranasal sinuses or result of a systemic disorder.[5]

Treatment may be non surgical or surgical. Non surgical measures include anterior nasal packing (ANP), posterior nasal packing, chemical cauterization, electrical cauterization while surgical procedures include arterial ligation (external carotid, internal maxillary, anterior/posterior ethmoidal arteries).[6]

This conservative procedure used for controlling epistaxis is potentially associated with various complications like failure to stop bleeding, infection, septal perforation, long-term crusting, tattooing or mucocutaneous or allergic reactions to silver nitrate.[20]

The objective of this study was to assess the outcome of silver nitrate cauterization (SNC) in controlling epistaxis in paediatric patients in terms of success on initial attempt and complications like recurrence of bleeding, pain, infection, exposure of septal cartilage, septal perforation and stenosis of the nostrils.

## MATERIALS AND METHODS

This cross-sectional descriptive study was conducted at Department of ENT, Mufti Mehmood Memorial Teaching Hospital, D.I.Khan, from October 2010 to September 2012. After taking ethical committee approval, a signed informed consent containing terms of inclusion in study, details of the procedures, benefits and risks involved, was obtained from each patient.

All patients having ages between 6-16 years with spontaneous unilateral anterior epistaxis were included in the study. Patients with bilateral anterior epistaxis, posterior epistaxis, post-traumatic epistaxis, and epistaxis due to bleeding diathesis or neoplastic lesions

were excluded. Detailed otorhinolaryngological history and examination was carried out.

**Identification of the bleeding point:** After sitting the patient in examination chair and stabilizing his/her head with one hand, nose was inspected with Killian nasal speculum in the other hand under direct headlight illumination. After removal of blood clots, soaked cotton balls (1-2) in a mixture of 4% lidocaine and 1:1,000 epinephrine were put into the bleeding nostril for 5-10 minutes to achieve local anaesthesia as well as vasoconstriction. After removing the cotton balls, nose was re-examined. If the offending vessel had stopped bleeding, it appeared as a red dot on the nasal mucosa. If the vessel was still bleeding, active oozing was visible.

**Silver nitrate cauterization:** After achieving a clear view of the bleeding source, chemical cautery was achieved by applying silver nitrate impregnated stick to the bleeding point with firm pressure for 5–10 seconds. Cauterization was started on the edge of the bleeding/oozing area and moved radially into the centre. The surrounding 1cm area was also cauterized for the feeding vessels to limit recurrence. Excess silver nitrate was carefully removed by a saline soaked cotton pledget to prevent staining of the vestibule or upper lip. If staining did occur, it was neutralized immediately by applying normal saline. Furacin antibiotic ointment was applied to the cauterized area and was continued two times daily for two weeks to prevent infection. Liquid paraffine nasal drops were advised 3-4 drops three times per day to prevent crusting which can restart bleeding.

If cauterization failed to control bleeding on initial attempt, ANP was done. Any nasal bleeding which reoccurred within two weeks on the same side after the aforementioned procedure was considered as recurrence.

All patients were reviewed fortnightly for six weeks. On every visit patients were asked about any bleeding episode on the cauterized side. They were also examined for signs of infection, exposure of septal cartilage, stenosis of the nostrils and septal perforation.

Gender and age were demographic variables while success on initial attempt, recurrence of bleeding, pain, infection, exposure of septal cartilage, septal perforation and stenosis of nostrils were study variables. Age being a numeric data was expressed as mean, standard deviation and range while the rest were nominal data and expressed as frequency and relative frequency. The data were analyzed by SPSS 17 (SPSS.Inc., Chicago, Illinois, USA).

# RESULTS

Out of 75 patients 49 (65.35%) were male and 26 (34.65%) female with male preponderance. (Table 1)

**Table No. 1: Gender and age wise distribution of the patients with Epistaxis undergoing Silver Nitrate Cautry (N=75)**

| Gender | N (%) | Mean Age (Years) | Standard Deviation | Range (years) |
|---|---|---|---|---|
| Male | 49 (65.35%) | 11.24 | 3.41 | 6-16 |
| Female | 26 (34.65%) | 08.88 | 2.21 | 6-16 |
| **Total** | **75 (100%)** | **10.43** | **3.23** | **6-16** |

Table-2 shows the analysis of the seven study variables. Silver nitrate cauterization was successful on initial attempt in 69 (92%) patients. Recurrence of bleeding, infection and exposure of septal cartilage were noted in 7 (9.35%), 2 (2.65%) and 1 (1.33%) cases respectively. No single case of septal perforation or stenosis of nostrils was seen.

**Table 2: Analysis of Study Variables of the patients with Epistaxis undergoing Silver Nitrate Cautery (N=75)**

| S.No | Study variables | Frequency (N) | Relative frequency (%age) |
|---|---|---|---|
| 1 | Success on initial attempt | 69 | 92.00 |
| 2 | Recurrence of bleeding | 7 | 09.35 |
| 3 | Pain | 6 | 08.00 |
| 4 | Infection | 2 | 02.65 |
| 5 | Exposure of septal cartilage | 1 | 01.33 |
| 6 | Septal perforation | 0 | 00.00 |
| 7 | Stenosis of nostrils | 0 | 00.00 |

# DISCUSSION

Most epistaxis patients can be managed in a non-interventional manner. Interventional treatment is warranted when bleeding is continued after adequate conservative treatment or when bleeding is massive and severe. In the present study we studied the efficacy of a conservative treatment modality in the form of silver nitrate cauterization in managing spontaneous epistaxis in children for the following reasons; first anterior epistaxis is a common presentation in paediatric age[7] and secondly, till now there is no single study carried out in Pakistan highlighting the efficacy of silver nitrate cauterization in this particular age group.

In the present study the age range (6-16 years) of our patients is almost similar to that in the study by Awan and Felek et al (5-16 years).[8,20] The increased incidence of epistaxis in younger age is probably due to active

involvement in out-door activities like sports and road traffic accidents.[11] Our study is consistent with other studies in showing male preponderance.[10,12,13] Globally there is a male preponderance in epistaxis except in the geriatric age group in some reports where no significant sex difference exists.[14]

Cauterization of the bleeding site can be performed chemically, electrically or with laser[15], though we used only chemical cautery with Silver nitrate. Silver nitrate was used successfully in 92% patients on initial attempt. The overall success rate for cauterization was thus higher than that reported by Razdan et al (72.07%) [15] John et al (78.6%),[16]and Felek et al (76%).[18] Nemer and Mottasim in Jordan reported a success rate of 74% which is lower than that of ours.[17]

Recurrence of bleeding was seen in 9.35% patients with silver nitrate cauterization in our study. This positive outcome may be due to the effective mode of application of silver nitrate cautery. Both patients related and technique related factors may be responsible for failure. Patient related factors may include associated pain and non-cooperation. While technique related factors may be: insufficient illumination, not identifying the bleeding point adequately and overall the patient may be suffering from any bleeding diathesis.

In our study infection (sinusitis) was seen in 6 % patients. But another study has reported a non significant incidence of infection associated with silver nitrate cauterization in children.[20]

None of our patient encountered septal perforation as supported by local and international literature.[19,20] For this positive outcome, the most probable reason may be that we performed cautery unilaterally in one setting with the fear that bilateral cautery may damage perichondrium on both the sides leading to nasal septal perforation, as reported by Hussain et al.[9] Even septal perforation was not recorded after bilateral septal cauterization with silver nitrate in children in single setting by Link et al.[20]

The present study is limited because of the small study groups. A large sized, prospective, randomized and a multi centre study is recommended to study the efficacy of silver nitrate cauterization in managing spontaneous unilateral anterior epistaxis in children.

# CONCLUSION

The increased success rate and decreased post procedure morbidity associated with silver nitrate cauterization make it an effective and safe procedure for managing spontaneous unilateral anterior epistaxis in children.

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