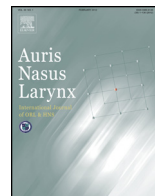




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Risk factors for recurrent epistaxis: Importance of initial treatment

Yuji Ando^{a,*}, Jiro Iimura^{a,1}, Satoshi Arai^{a,1}, Chiaki Arai^{a,1}, Manabu Komori^{a,1}, Matsusato Tsuyumu^{a,1}, Takanori Hama^{b,2}, Yasushi Shigeta^{a,1}, Atsushi Hatano^{a,1}, Hiroshi Moriyama^{b,2}

^a Department of Otorhinolaryngology, Jikei University Daisan Hospital, 4-11-1, Izumi-honcho, Komae-shi, Tokyo 201-8601, Japan

^b Department of Otorhinolaryngology, Jikei University School of Medicine, 3-25-8, Nishi-shinbashi, Minato-ku, Tokyo 105-8461, Japan

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ABSTRACT

Objective: A retrospective study of risk factors for recurrent epistaxis and initial treatment for refractory posterior bleeding was performed. Based on the results, proposals for appropriate initial treatment for epistaxis by otolaryngologists are presented.

Methods: The data of 299 patients with idiopathic epistaxis treated during 2008–2009 were analyzed by multivariate logistic regression analysis. Treatment data for 101 cases of posterior bleeding were analyzed using the chi-square test.

Results: Recurrent epistaxis occurred in 32 cases (10.7%). Unidentified bleeding point (adjusted odds ratio (OR) 5.67, 95% confidence interval (CI) 1.83–17.55, $p = 0.003$) was predictive of an increased risk of recurrent epistaxis, and electrocautery (adjusted odds ratio (OR) 0.07, 95% confidence interval (CI) 0.03–0.17, $p = 0.000$) was predictive of a decreased risk of recurrent epistaxis. In terms of initial treatment for posterior bleeding, the rate of recurrent epistaxis was significantly lower for patients who underwent electrocautery as initial treatment compared with those who did not (6.4% vs. 40.7%, $p < 0.01$), and it was significantly higher for those who underwent endoscopic gauze packing compared with those who did not (39.5% vs. 15.9%, $p < 0.01$).

Conclusion: In the present study, the risk factors for recurrent epistaxis were unidentified bleeding point. Thus, it is important to identify and cauterize a bleeding point to prevent recurrent epistaxis. The present results also suggest the effectiveness of electrocautery and the higher rate of recurrent epistaxis for patients who underwent gauze packing as initial treatment for posterior bleeding. Electrocautery should be the first-choice treatment of otolaryngologists for all bleeding points of epistaxis, and painful gauze packing may be inadvisable for posterior bleeding. More cases of posterior bleeding are needed for future studies involving multivariate analyses and appropriate analyses of factors related to hospitalization, surgery, and embolization.

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1. Introduction

Epistaxis is one of the commonest otolaryngological emergencies, occurring in 60% of adults over their lifetimes, but treatment is required in only 10% of cases [1]. Although surgical intervention is rarely necessary, refractory recurrent epistaxis may occur in some cases, and epistaxis is a common cause of hospitalization in departments of otolaryngology [2]. There have been many studies of epistaxis, with constant debate as to whether factors such as hypertension and antithrombotic agent use constitute risk factors,

but to the best of our knowledge, there have been few reports addressing risk factors for recurrent epistaxis, and it is remarkable that no studies that have used statistical analyses for their investigation.

Hemostasis is particularly difficult for posterior bleeding compared with anterior bleeding, and treatment fails in many cases, with recurrent epistaxis occurring frequently. However, cotton packing, balloon catheters, Foley catheters, and other such methods are still the main forms of treatment, rather than pinpointing the bleeding point and achieving hemostasis.

In this study, a retrospective study of risk factors for recurrent epistaxis was carried out in 299 patients. Posterior bleeding was treated with either endoscopic electrocautery after endoscopic identification of the bleeding point insofar as this was possible or endoscopic gauze packing, and their efficacies were compared.

* Corresponding author. Tel.: +81 3 3480 1151x3141; fax: +81 3 3430 3611.

E-mail address: andoh.ent@gmail.com (Y. Ando).

¹ Tel.: +81 3 3480 1151x3141; fax: +81 3 3430 3611.

² Tel.: +81 3 3433 1111x3601; fax: +81 3 3578 9208.

2. Patients and methods

2.1. Patients

A total of 346 patients visited The Jikei Daisan Hospital because of epistaxis between June 2008 and May 2009. Of these patients, 24 children who were 15 years old and under were excluded, because, unlike in adults, the cause of epistaxis in children is usually from picking, rubbing, and hitting their nose, as well as an infection [3,4]. A further 10 patients with traumatic epistaxis, 6 with bleeding from the nasal cavity and paranasal sinus tumors, 4 with postoperative epistaxis, and 3 with hereditary hemorrhagic telangiectasia were excluded because the methods to stop such bleeding differ from those for idiopathic epistaxis. Thus, 299 patients with idiopathic epistaxis were studied.

2.2. Methods

2.2.1. Medical examination

First, to identify the risk factors for recurrent epistaxis, the following patient characteristics were examined at their first visit to the hospital: age, sex, antithrombotic agent use (i.e., aspirin, warfarin, etc.), past history (hypertension, hematologic disease, allergic rhinitis, chronic sinusitis, nasal and/or paranasal surgery, benign or malignant tumor, trauma), and deviated nasal septum.

Next, at the time of their second visit (1 week later), the patients were interviewed about the incidence of recurrent epistaxis after their first treatment. Furthermore, tampons were removed if they had undergone gauze packing, and whether the bleeding in their nose had stopped was checked.

If epistaxis recurred within a week, the patients were told to come back to the hospital so that the recurrent bleeding point could be identified and treated.

2.2.2. Bleeding point identification

Visible bleeding points, such as Kiesselbach's plexus (Little's area), were initially identified with a nasal speculum, and cotton was inserted into the posterior nasal cavity to prevent blood from running down the pharynx.

If a bleeding point could not be identified, the patient's nose was examined in detail using a flexible endoscope and a rigid endoscope with zero degrees of view. Because blood flows from top to bottom when the patient is seated, the search for a bleeding point with an endoscope was performed in the following order: upper olfactory cleft, upper middle meatus, lower olfactory cleft, lower middle meatus, common meatus, and inferior meatus. If it was difficult to locate a bleeding point even with this method, a rigid endoscope with 70° of view was used to examine the lateral wall of the nasal cavity, for example, the posterior middle meatus.

When a very swollen blood vessel was found, it was checked for bleeding by rubbing it and by applying suction.

In this way, each patient's bleeding point was identified as follows: *Kiesselbach's plexus, olfactory cleft, middle meatus, inferior meatus, other regions, and unidentified bleeding point.*

2.2.3. Treatment

The treatment used to stop the bleeding was classified into three groups.

The first group, the *hemostatic material* group, included patients with a very small amount of bleeding and those in whom oxidized cellulose (SURGICEL Absorbable Hemostat[®], Ethicon Inc., Somerville, NJ, USA) was inserted into the nose.

The second group was the electrocautery group. Electrocautery was considered the first-choice treatment for a certain amount of bleeding. A bleeding point was cauterized initially using straight or curved bipolar forceps under direct vision with the naked eye, and

then with endoscopy secondarily. A monopolar electrode, as effective as bipolar forceps, however, causes stronger heating damage [5,6], was used only if it was difficult to cauterize the bleeding point with bipolar forceps.

The third group was the *endoscopic gauze packing* group. Gauze packing was selected for treatment of epistaxis only when the bleeding point was unidentified or electrocautery was difficult, for example, in patients with a narrow space in the nasal cavity. Gauze was packed intensively into all possible bleeding space with an endoscope.

Balloon catheters (e.g., the Epistat[™], Medtronic Inc., Jacksonville, Florida, and Storz T-3100, KARL STORZ GmbH & Co. KG, Tuttlingen, Germany) and Foley catheters were not used as first-choice treatments in this study.

2.2.4. Statistical analysis

First, baseline characteristics stratified by the incidence of recurrent epistaxis, including patient characteristics, bleeding points, and treatments, were analyzed. Student's *t*-test and the χ^2 test were used to evaluate differences in these characteristics between patients with and without recurrent epistaxis.

Next, logistic regression analysis was performed, defining recurrent epistaxis as the dependent variable, and patient characteristics, all of the bleeding points, and medical treatment as the independent variables. Of these risk factors, patients were classified by age into those aged 45–65 years, which has been identified in the literature as an age group at risk of epistaxis, and others [7].

Finally, the relationship between recurrent epistaxis due to 'posterior bleeding' and treatments was examined using the χ^2 test. 'Posterior bleeding' was defined as bleeding points other than those from Kiesselbach's plexus, because all anterior bleeding in this study arose only from Kiesselbach's plexus.

All statistical analyses were performed by SPSS 11.0J for Windows (International Business Machines Corporation, Armonk, NY, USA). A value of $p < 0.05$ was considered significant.

3. Results

3.1. Characteristics and recurrent epistaxis

The baseline characteristics of the patients (126 women, 173 men; mean age \pm SD, 64.8 ± 14.5 years), stratified by the incidence of recurrent epistaxis, are shown in Table 1. Recurrent epistaxis occurred in 32 cases (10.7%). Overall, 94 patients (31.4% of all) had taken an antithrombotic agent. Their principal past history included hypertension (155 patients, 51.8%) and allergic rhinitis (61 patients, 20.4%). A deviated nasal septum on the bleeding side was seen in 149 cases (49.8%). However, there were no significant differences in these factors between patients with and without recurrent epistaxis. On the other hand, Kiesselbach's plexus (198 cases, 66.2%), unidentified bleeding point (31 cases, 10.4%), and each category of treatment (i.e., hemostatic material (27 cases, 9.0%), electrocautery (234 cases, 78.3%), endoscopic gauze packing (38 cases, 12.7%)) were significantly different between patients with and without recurrent epistaxis ($p < 0.05$).

3.2. Risk factors for recurrent epistaxis

The results of the univariate and multivariate analyses for recurrent epistaxis according to each factor are presented in Table 2.

On univariate analysis, unidentified bleeding point (unadjusted odds ratio [OR] 20.48, 95% confidence interval [CI] 8.51–49.30, $p = 0.000$), hemostatic material (unadjusted OR 4.35, 95% CI 1.72–10.99, $p = 0.002$), and endoscopic gauze packing (unadjusted OR

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