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# Epistaxis and its management: an observational pilot study carried out in 23 hospital centres in France*

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SUMMARY

***Objective:*** *The purpose of this study is to describe the treatment of epistaxis in hospital emergency departments and to identify the principal risk factors for more severe episodes of bleeding.*

***Study protocol:*** *Prospective cross-sectional epidemiological study*

*Material and Methods: This study was carried out in 23 hospital centres in France, most of them teaching hospitals. Every patient presenting non-traumatic epistaxis or else associated with hereditary hemangioma during two consecutive and separate 24-hour periods were included.*

***Results:*** *Fifty patients were included in the study. Nasal bleeding was stopped within 30 minutes for 47 patients. Fourteen patients were hospitalized. The risk factors for severe epistaxis included either copious bleeding or else bleeding for more than 6 hours or patients aged 65 and over. A history of repeated nasal packing and/or taking medication with a known hemorrhagic risk was associated with the amount and duration of bleeding ($p < 0.05$).*

***Conclusion:*** *Risk factors for severe epistaxis should be identified as to improve patient care and avoid treatment failure or useless hospitalization.*

*Key word: epistaxis, embolization, nasal packing*

## INTRODUCTION

Epistaxis is a frequent occurrence; 60% of the general public have at least had one nosebleed during their lifetime[(1)]. Although the bleeding often stops spontaneously and is of no consequence, epistaxis should be considered as a potentially serious problem. Although very few studies are available, in a large series, 11% to 25% of all patients seen in emergency departments for nasal bleeding were hospitalized[(2-4)]. Furthermore, according to the data of the French national medical statistical centre[(5)] (PMSI 2002), death occurred in 38 patients as a direct consequence of epistaxis in 2002. That fact alone confirms the vital risk of this pathology.

However, current patient care is generally based on empirical choices, due to the lack of guidelines in France since health care professionals have been unable to reach a consensus regarding the treatment of epistaxis[(1,6,7)].

The present study was carried out so as to collect information concerning the management of epistaxis in order to identify the principal factors that may influence nasal bleeding and the need to hospitalize the patient referred for epistaxis in 23 emergency departments in France.

## MATERIAL AND METHODS

*Study protocol*

This study was prospective, observational and cross-sectional with data collected during two separate consecutive 24 hour periods (June 22, 2001 and June 29, 2001), in the emergency departments of 23 hospital centers in France, 21 of which were university hospitals.

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*Patients*

During this period, every single adult patient admitted in the hospital with an epistaxis due to non-traumatic causes was included in the study.

*Treatment and data collection*

Treatments were decided and followed the routine management of epistaxis in each emergency department. No recommendation or guidelines were given before the enrollment in the study, as it was an observational study. Following the usual procedural habits in participating hospitals, the patients were either directly treated by the ENT physician on-call, or initially treated by the emergency physician and then by the on-call consultant if necessary. The following data were collected for each patient:

- Demographic (gender, age)
- Other concurrent illnesses or medications
- History of epistaxis (previous episodes over the last 6 months, previous visits, previous nasal packing 7 days and over), duration of the present episode
- Initial clinical examination:
  - blood pressure,
  - presence of nasal packing: in the nostril, anterior, antero-posterior,
  - bleeding characteristics: bleeding not copious (less than 250 ml of blood), copious bleeding (more than 250 ml of bleed), discontinuous bleeding $<$ 6 hours, and discontinuous bleeding $>$ 6 hours
- Initial treatment:
  - initial maneuvers: head forward, blowing of the nose, suction of the clot, use of a vasoconstrictor
  - local procedures: nasal packing, bidigital pressure, chemical cauterization, electric cauterization
- Initial treatment and following results.

*Ethics*

Consistent with French legislation, this study was initially registered with the National Commission of Information and Rights (CNIL). The participation of the different emergency departments in the study was announced on posters, and the patients were informed verbally by the treating specialist on-call and were shown written information about the study.

*Statistical analysis*

The statistical analysis was completed with the SAS software (version 8.2). Initially, the variables were presented as descriptive data. Then, an exploratory analysis was done to identify the risk factors influencing epistaxis failures. In this process, the variables for previous patient history, history of the epistaxis, bleeding characteristics and course and final disposition of patients were put together and their independence tested by the $\chi^2$ and Fisher tests.

RESULTS

*Patient data*

Demographic

During the two study days, 50 patients with an average age of 52 were included: males were predominant (35 M / 15 F) (Table 1). The number of patients per centre ranged from 0 to 7 with an average of 2 patients.

Other concurrent illnesses or medications (Table 1)

More than one third of these patients had had a previous history of hemorrhagic problems (poorly controlled hypertension, chronic alcoholism, hepatic insufficiency, and nasal fossa tumor) or had received a medication within the previous 10 days that increased the hemorrhagic risk (platelet inhibitors, NSAIDS, salicylate derivatives, antivitamin K, beta lactams, antidepressants, long-term steroids).

*History of epistaxis (Table 1)*

Most episodes of epistaxis had been recurrent in the case of 35 patients (70%) reporting previous epistaxis during the preceding 6 months (on the same side as the current episode), and 29 (58%) having had at least one nasal packing during the previous 7 days (Table 1). Within this last group, some of the patients had a history of multiple nasal packings (from 2 to 8 nasal packings for 6 patients).

Table 1. Demographic characteristics and previous medical history of patients.

| **Demographic and clinical characteristics** | |
|---|---|
| Patients included | n = 50 |
| Gender (%) | |
| Male | 35 (70%) |
| Female | 15 (30%) |
| Age | |
| Mean (years) | 52,46 ± 18,95 |
| Age ≥ 65 years (%) | 14 (28%) |
| Systolic arterial pressure (mm Hg) | 145 ± 24 |
| Diastolic arterial pressure (mm Hg ) | 83 ± 14 |
| **Previous History** | |
| Previous history of hypertension | 15 (30%) |
| Previous history of pathology with a hemorrhagic risk[(1)] | 18 (36%) |
| Medications with a hemorrhagic risk [(2)] currently or stopped within the last 10 days | 21 (42%) |
| History of epistaxis in the previous 6 months | 35 (70%) |
| Average number of episodes (n) | 4.06 |
| At least one nasal packing in the previous 7 days | 29 (58%) |
| Rebleeding on packing removal | 15 (45%) |
| Previous visit with a consultant | 25 (50%) |

[(1)] Poorly controlled hypertension, chronic alcoholism, hepatic insufficiency, nasal fossa tumor.

[(2)] Platelet inhibitors, NSAIDS, salicylate derivatives, antivitamin K, beta lactams, antidepressants, long-term corticosteroids.

Table 2. Location of initial bleeding and treatment.

| Location | Anterior | Posterior | Antero-posterior | Diffuse | Indeterminate |
|---|---|---|---|---|---|
| **Treatment** | **n = 31*** | **n = 2*** | **n = 4*** | **n = 8*** | **n = 5** |
| Bidigital pressure (n = 18) | 9 | 1 | 2 | 3 | 3 |
| Nasal packing (n = 23) | 11 | 2 | 4 | 4 | 2 |
| Chemical cauterization (n = 13) | 13 | 0 | 0 | 0 | 0 |
| Electrical cauterization (n = 7) | 5 | 1 | 0 | 1 | 0 |
| Balloons (n = 2) | 0 | 0 | 0 | 2 | 0 |
| No treatment (n = 2) | 2 | 0 | 0 | 0 | 0 |
| Embolization (n = 0) | 0 | 0 | 0 | 0 | 0 |

* Patients may have had multiple treatments.

Table 3. Link between bleeding characteristics on arrival and control of bleeding.

| | Bleeding > 6 hours | Bleeding < 6 hours | Copious bleeding | Bleeding not copious |
|---|---|---|---|---|
| Bleeding not controlled | 20% | 80% | 20% | 80% |
| Bleeding controlled | 97% | 3% | 100% | 0% |
| Hospitalized | 40% | 26% | 67% | 11% |
| Discharged home | 60% | 74% | 33% | 89% |
| At least one nasal packing | 100% | 48% | 67% | 54% |
| No nasal packing | 0% | 52% | 33% | 46% |
| Medication with hemorrhagic risk | 50% | 40% | 67% | 31% |
| No medication with hemorrhagic risk | 50% | 60% | 33% | 69% |

*Initial clinical presentation*

On their arrival at the emergency department, 27 patients (54%) already had a nasal packing in place (in the nostril for 15 patients, anterior packing for 11 and antero-posterior packing for 1 patient). The nasal bleeding had lasted discontinually more than 6 hours for 10 patients (20%) and was copious in 15 patients (30%). Bleeding was unilateral in 46 patients (right nasal cavity in 24 cases, and left nasal cavity in 22 cases) and bilateral in 4 patients.

*Initial patient care*

The ENT specialist was responsible for initial patient care in 78% of the cases. The most common initial step was either blowing the nose and/or putting the head in a forward position (about 60% of the cases). The utilization of a local vasoconstrictor and/or anesthetic (48%), the suction of clots (38%), and nasal endoscopy (14%) as the initial maneuver were less frequent.

The source of the bleeding was assessed for more than three-quarters of the patients (Table 2).

Regarding overall treatment procedures, 25 patients (50%) had a nasal packing placed (3 nostril, 20 anterior, 2 antero-posterior), 18 (36%) had bidigital pressure, 13 (26%) had chemical cauterization and 7 (14%) had electrical cauterization.

*Course of epistaxis and patient disposition*

The initial treatment successfully stopped nasal bleeding within 30 minutes in 47 patients (94%). A total of 14 patients (28%) were hospitalized while 36 (72%) were sent home, 14 of these with nasal packing in place.

*Analysis of risk factors for severe bleeding*

Inability to initially control bleeding was significantly more frequent in patients who had experienced bleeding for more than 6 hours ($p = 0.04$) or copious bleeding ($p = 0.006$). Hospitalization was significantly higher ($p < 0.001$) in patients with copious bleeding (Table 3). Patients aged 65 and over, were significantly more frequently hospitalized (57.1% vs 16% $p = 0.004$) (Table 3).

Additionally, the duration and amount of bleeding were confirmed to be related to a history of repeated nasal packing.

Finally, the patients who had taken medication with a hemorrhagic risk during the previous 10 days were more likely to present copious bleeding ($p = 0.02$) (Table 3). The significant links between patient history, characteristics of the bleeding, and hospitalization are presented in Figure 1.

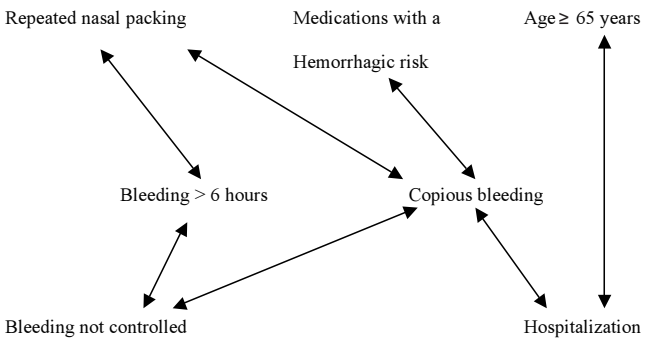


Figure 1. Significant links between previous history, bleeding characteristics and hospitalization.

## DISCUSSION

The methodology chosen for this study was well adapted to our stated goal, since it provided a "snapshot" of a phenomenon, without artificially changing any variables as is usually done in clinical studies. Nevertheless, we can't exclude that due to the information given for the study, the emergency units may have been more concerned and may have modified their management procedures, although it was recommended to proceed as usual. The centres (23 hospital centres, most of them university hospitals) are well distributed over the country and are representative of the characteristics and treatment of epistaxis in the emergency and ENT departments of hospital centres in France. The results of this study confirm the strong necessity to create guidelines for the management of epistaxis and to improve the education of primary practitioners concerned with this emergency. Further studies will be necessary to confirm these results.

*Demographic data*

The average age of 52 is slightly lower than what is found in the literature (over 56) [3,4,8-11]. However, 58% of all patients in this study were 50 and over, which confirms the increased incidence of epistaxis after that age[3,4,6,8-10,12].

*Other concurrent illnesses or medications*

Among concurrent medical problems, arterial hypertension was found higher in our patients than in the general population (30% vs 16.5%)[13], although its involvement in causing epistaxis has not been totally established[11,13-16]. However, it is suspected than such findings may be related to an anxiety situation. After the episode of epistaxis most patients were spontaneously normopressed.

Upon arrival in the hospital, 42% of the patients were taking or had taken in the previous 10 days one or two medications increasing their hemorrhagic risk[11,12,17,18].

*History of epistaxis*

The patients had generally been prone to episodes of epistaxis: they had an incidence higher than that found in other studies[4,6,9,11,19].

*Initial clinical exam*

Although most patients were examined in a university hospital, nasal endoscopy was not performed as routinely as suggested in the literature[20]. The use of an endoscope would have probably reduced the number of nasal packings and hospitalization. Nevertheless, it is not yet available in most care centres due to the lack of practitioners trained in this technique.

*Success of initial hospital treatment*

Initial treatment successfully stopped nasal bleeding in 47 out of 50 patients.

Our study confirms that hospital treatment of epistaxis involves, in most cases, treatment modalities requiring specialist experience and specialized medical equipment and supplies, such as double balloon nasal packing catheters and cauterization, as well as bipolar cauterization under local or general anesthesia and embolization[1,6,7,21-24]. However, no centre was able to propose, as has been suggested by some authors[20,25], a coagulation under endoscopic control. If this technique is costless in terms of hospitalization and associated with a low level of morbidity, it can't be considered as a routine, especially at night. Furthermore coagulation needs to be normal to allow such a procedure.

Fourteen patients were hospitalized (28%). That is slightly higher than the hospitalization rate given in the literature (11% to 25%)[2-4,9]. The need for hospitalization was associated with copious bleeding on arrival and patients aged over 65.

*Risk factors for more severe bleeding*

In the inability to control bleeding, the risk factors are the duration of bleeding of more than 6 hours and copious bleeding on the patient's arrival.

Our study also shows the aggravating role of medications that increase the risk of hemorrhage, and of repeated nasal packing placements that were linked to the amount of bleeding and its over 6 hours duration.

*Patient treatment pathway*

Our study confirms the existence of an escalating epistaxis treatment pathway.

Among the factors that can explain the escalation in epistaxis treatment, this study shows that local treatment is often not well adapted to the problem.

The two patients who required second-line treatment, under the form of a bipolar cauterization of the sphenopalatine artery under general anesthesia and an embolization, were packed and repacked nasally 5 and 8 times before arrival at the hospital, respectively.

According to a majority of authors[20,26], repeated nasal packing placement can cause mucosal damage and greatly complicate specialist treatment[4,27]. The frequency of the re-bleeding depends on the nasal packing material used[9,27-31]. The choice of the packing material has to be assessed by comparative studies.

Thus, an improvement in the education of practitioners in charge of the management of epistaxis in emergency unit would probably be the most adequate solution to promote.

## CONCLUSION

The knowledge of the risk factors for epistaxis should improve patient care in hospital emergency departments and avoid escalating treatment modalities that lead to initial treatment failures and the need for hospitalization. This way, a profile of patients at greater risk can be recognized (patient age, copious or prolonged bleeding), urging them to visit the ENT consultant.

Aggravating factors, such as the effects of medications with

risk for an hemorrhagic and repeated nasal packing, can be limited by the global treatment of the patient at every step of his care, with the use of local treatments that spare the nasal mucosa.

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