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ORIGINAL RESEARCH

Prospective clinical study of bleeding sites in idiopathic adult posterior epistaxis

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OBJECTIVES: The precise identification of the bleeding point is important to the efficient management of epistaxis. Our hypothesis was that the septum was the commonest bleeding site.
STUDY DESIGN AND SETTING: This was a prospective clinical study of 50 consecutive adult idiopathic posterior epistaxis patients carried out in a busy teaching hospital.
METHODS: The nasal cavity was inspected with endoscopy to identify the site of bleeding before any intervention. The location of bleeding sites was recorded on a proforma.
RESULTS: Of bleeding sites posterior to the piriform fossa, 94 percent were identifiable, with 70 percent arising from the septum.
CONCLUSIONS AND SIGNIFICANCE: This is the largest prospective study of the bleeding site in adult patients with posterior epistaxis and the only one with a well-defined population. The vast majority of posterior bleeding sites can be identified by endoscopy without general anesthesia. The septum should be examined closely in cases of idiopathic bleeding.

Epistaxis is the most common ENT emergency.[1] From 5 to 10 percent[2,3] of nosebleeds arise from the posterior part of the nasal cavity, but the precise figure depends on which arbitrary definition of posterior epistaxis has been used.[4] Although bleeding point identification is key to efficient management, debate and uncertainty remain around the actual location and distribution of the bleeding sites in epistaxis. Curiously, British authors[5,6] tend to support the idea that the septum is the most common site, whereas North American authors[7,8] favor the lateral nasal wall, in particular referring to Woodruff's plexus, which is a group of blood vessels lying at the posterior part of the inferior meatus.[9] Although there have been many reports in the literature describing the distribution of bleeding sites (Table 1), all of these have inherent design problems, particularly with regard to heterogeneous patient populations. We aimed to use a uniform patient group to test the hypothesis that idiopathic posterior epistaxis in adults arises most frequently from the septum.

MATERIALS AND METHODS

During the 1-y period of this prospective clinical study, 50 consecutive adult emergency admissions to the Glasgow Royal Infirmary for idiopathic posterior epistaxis were examined by the senior author. The procedure was approved by the local institutional review board. In order to have a well-defined population, patients with a discernible cause for their epistaxis, such as trauma, surgery, or bleeding diathesis, were excluded, as were those who bled from a point anterior to the piriform fossa or aperture (our boundary dividing the anterior from the posterior nasal cavity). The plane of the aperture corresponds to the bony−soft tissue junction of the external nose and is identified by using Thudicum's speculum, noting the junction of the upper lateral cartilages and nasal bones superiorly and following this inferolaterally to just anterior to the anterior end of the inferior turbinate and then to the septum.

Before any definitive intervention, rod lens endoscopy was used to identify the bleeding sites. A strip of cotton wool soaked in 1.5 mL of 10 percent cocaine was inserted before examination. A 2.7-mm 25° endoscope (Richard Wolf Endoscope Limited, London, UK) was preferred to a 4-mm scope because the narrower diameter allowed easier negotiation of septal deviations and spurs, reducing patient discomfort and also allowing more room for the insertion and manipulation of other instruments such as a suction catheter or cautery probe.[10] A systematic search was carried out starting with the inferior meatus and turbinate, then examination of the middle meatus and turbinate, followed by the septum, nasal vault (including the superior turbinate and sphenoethmoidal recess), and then the floor of the nose and postnasal space. A structured classification scheme was used to precisely record the location of bleeding sites in the nasal cavity (Fig 1).

RESULTS

The mean age of the patients (all whites) was 64 years old; 28 of the 50 were males. A source of bleeding was

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Table 1
Summary of articles that describe the site of bleeding in posterior epistaxis

Authors, y, country	Lateral bleeding sites (n)	Medial bleeding sites (n)	Unidentified bleeding sites (n)	Comments
Ogura and Senturia,[11] 1949, US	23	5	10	*†‡{parallel marks}
Hallberg,[7] 1952, US	22	6	37	*†‡{parallel marks}
Tucker,[12] 1963, UK	2	5	27	‡{parallel marks}
Shaheen,[13] 1967, UK	0	34	38	§{parallel marks}
Rosnagle et al,[14] 1973, US	25	3	30	*†‡{parallel marks}
Anderson et al,[15] 1982, US	7	3	—	*{parallel marks}
Jackson and Jackson,[16] 1988, US	39	36	0	*†‡{parallel marks}
Marcus,[17] 1988, US	16	0	—	*{parallel marks}
Wurman et al,[18] 1988, US	16	0	2	§{parallel marks}
Padgham,[6] 1990, UK	11	7	6	*†‡{parallel marks}
McGarry,[19] 1991, UK	3	8	0	*{parallel marks}
Bingham and Dingle,[20] 1991, UK	1	1	0	†{parallel marks}
O'Leary-Stickney et al,[21] 1992, US	4	1	—	§{parallel marks}
El-Silimy,[22] 1993, UK	6	16	2	*{parallel marks}
Pollice and Yoder,[23] 1997, US	118	0	0	*†{parallel marks}
Frikart and Agrifoglio,[24] 1998, Switzerland	70	21	39	*{parallel marks}
Elwany and Abdel-Fatah,[25] 1998, Egypt	23	9	0	*{parallel marks}
Thornton et al,[4] 2005, UK	29	7	7	*‡

*Patients in these studies had had treatment before inspection of the posterior bleeding sites, most commonly packing.
†These studies included patients with known causes for their bleeding such as tumors, trauma, surgery, hereditary hemorrhagic telangectasia, and coagulopathies.
‡These studies included children.
§These studies furnished very little details on their patients.
{parallel marks}These studies were retrospective in design; one study claims to be prospective.[4]

identifiable in 94 percent of cases, which is comparable to most of the recent series.[4] In three cases, no bleeding was found and none of these patients bled again after the examination. A plexus-like structure compatible with the description of Woodruff's naso-nasopharyngeal plexus was seen in some cases but was never the actual source of bleeding.

1. The majority (70%) of the posterior epistaxis arose from the septum—and was as likely to arise from the upper septum (36%) as from the lower septum (34%).
2. On the lateral wall, 4 and 12 percent of bleeds arose from above and below the lower edge of the middle turbinate, respectively. Only 8 percent of posterior epistaxis arose from an area compatible with the definition of Woodruff's plexus (Fig 2).

DISCUSSION

Precise local control of bleeding is the key to the management of epistaxis. While there have been many articles that have identified the sites of bleeding as part of their study, few have concentrated on the bleeding site alone.[4] Fundamental flaws in all clinical studies of posterior epistaxis to date have been weaknesses in their design, in particular:

- The inclusion of heterogeneous patient groups, such as epistaxis following trauma or surgery, bleeding in children, and so on.
- Patients are often seen after treatment with packing or balloon insertion.
- Studies have been retrospective.
- Definitions of posterior epistaxis are not well defined, are inconsistent, or are arbitrary (eg, failure of anterior rhinoscopy, which is variable and dependent on experience[4]).
- Examination techniques are variable, including use of endoscopy, general anesthesia, or not defined. The actual locations are not precisely recorded, and there is potential for ambiguity (eg, sphenopalatine artery,[7,24] roof,[14] or floor of the nose,[6,22] which could be either medial or lateral, or neither).

This means that conclusions drawn from individual studies have limited validity and are difficult to compare but will also make them unsuitable for meta-analysis.

Consequently, there was a need for a well-defined study to examine a population that could accurately be described as adult idiopathic posterior epistaxis. The important features in this study were as follows: