Posterior epistaxis: systematic review on the effectiveness of surgical therapies
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CRD summary
This review assessed the effects of ligation of the internal maxillary artery and the sphenopalatine artery in patients with posterior epistaxis. The authors concluded that there was insufficient evidence to draw definitive conclusions and further research is required. Given that the evidence came from retrospective observational studies, the authors' conclusions appear appropriate.

Authors' objectives
To assess the effects of ligation of the internal maxillary artery (IMAXA) and the sphenopalatine artery (SA) in patients with posterior epistaxis.

Searching
MEDLINE, MEDLINE In-Process and the Cochrane Library (including the Cochrane CENTRAL Register) were searched from inception to May 2004 without any language restrictions. The authors stated that the search strategy was available in an appendix. The reference lists of primary studies were screened.

Study selection
Study designs of evaluations included in the review
Studies of any design that followed up patients for at least 30 days were eligible for inclusion. Case series were only eligible if they included at least 3 patients. The duration of follow-up in the included studies ranged from 1 to 48 months.

Specific interventions included in the review
Studies that evaluated ligation of the IMAXA or the SA were eligible for inclusion. Studies that evaluated occlusion of the arteries by percutaneous embolisation were excluded. The included studies evaluated ligation of the IMAXA and ligation of the SA, both with and without concomitant ligation of the anterior ethmoidal artery or both ethmoidal arteries. Ligation of the IMAXA included transantral and endoscopic ligation; ligation of the SA included transantral, transseptal endoscopic and endoscopic ligation, endoscopic electrocoagulation and SA coagulation.

Participants included in the review
Studies of adults with posterior epistaxis were eligible for inclusion. Where stated, the mean age of the participants ranged from 50 to 66 years.

Outcomes assessed in the review
The main review outcomes were recurrence of bleeding and post-operative complications. Other outcomes included the duration of the surgical procedure, the complication rate and the length of hospital stay.

How were decisions on the relevance of primary studies made?
Two reviewers independently screened identified titles and abstracts and resolved any disagreements through discussion. One reviewer selected studies from full-text reports, with any uncertainties resolved through discussion with a second reviewer.

Assessment of study quality
The authors did not report any formal assessment of validity. However, aspects of methodological quality, such as the reporting of inclusion and exclusion criteria, the number of patients eligible for surgery and losses to follow-up, were noted in the discussion.
Data extraction
One reviewer extracted the data, which a second reviewer then checked. For each study, the percentage of patients with each outcome of interest or the mean outcome value was extracted. When required, authors were contacted for missing information about the patients, duration of follow-up and outcomes of interest.

Methods of synthesis
How were the studies combined?
The studies were grouped by the type of surgery and the outcomes summarised in the text of the review and tables.

How were differences between studies investigated?
Differences between the studies were evident from the text and tables.

Results of the review
Twenty-eight retrospective case series (n=736) were included. Of these, 15 studies evaluated ligation of the IMAXA (n=472) and 13 studies evaluated ligation of the SA (n=264).

None of the studies reported inclusion and exclusion criteria, the number of patients eligible for surgery, or losses to follow-up.

Ligation of the IMAXA.
Seven studies (n=145) reported no re-bleeding within 30 days; 8 studies reported re-bleeding rates ranging from 6 to 27%. The rates of re-bleeding within 1 year ranged from 0 to 44% (based on 8 studies).

The duration of post-operative hospital stay ranged from 2 to 11 days (based on 10 studies).

Complication rates varied widely (range: 2 to 85%). The most commonly reported complications were temporary facial swelling, ecchymosis and persisting facial numbness.

Ligation of the SA.

Three studies (n=28) reported no re-bleeding within 30 days; 10 studies reported re-bleeding rates ranging from 3 to 30%. The rates of rebleeding within one year ranged from 0 to 30% (based on 10 studies).

The duration of post-operative hospital stay was between 1 and 3 days in 6 studies, and was 9 and 13 days in a further 2 studies.

Complication rates varied widely: 6 studies reported no post-operative complications, whilst 3 studies reported rates of 7%, 16% and 53%, respectively. The most commonly reported complications were crust formation, sensation of dryness in the nose and persistent posterior rhinorrhea.

None of the studies directly compared ligation of the IMAXA with ligation of the SA.

Authors' conclusions
There was insufficient evidence to draw definitive conclusions about the most effective treatment of patients with posterior epistaxis. Further research is required.

CRD commentary
The review addressed a clear question that was defined in terms of the participants, intervention and outcomes; inclusion criteria for the study design were broad. Three relevant databases were searched, no language restrictions were applied, and some limited attempts were made to reduce publication bias. Methods were used to minimise reviewer errors and bias in the study selection and data extraction processes. Some aspects of validity were discussed and the
review authors commented upon the limitations of evidence from the identified retrospective observational studies. Appropriate methods were used to summarise study outcomes in the text and tables. However, potential reasons for varying outcomes across the studies were not discussed. Given that the evidence came from retrospective observational studies and none of the studies directly compared the surgical techniques, the authors’ conclusions appear appropriate.

**Implications of the review for practice and research**

**Practice:** The authors stated that in view of the limited evidence, the selection of surgical technique for managing patients with posterior epistaxis will depend upon the personal experience and preferences of the surgeons.

**Research:** The authors stated that studies directly comparing the effects of ligation of the IMAXA and ligation of the SA on re-bleeding, post-operative complications, duration of hospital stay and costs in patients with posterior epistaxis are needed. Research is also required to determine the most appropriate time for surgical treatment.

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