Sphenopalatine Artery Control Instructional Course

Mr Maged Abdelkader
MSc MD FRCS(Edin.,Glas.,Irel.) FRCS(ORL-HNS)Edin

Consultant ENT Head&Neck surgeon
Basildon & Thurrock University Hospitals
Associate Teaching Hospitals, University College London
UK

Topics

- Introduction
- Anatomy
- Indications
- Instruments
- Technique and pitfalls
- Results
- Conclusions
Epistaxis treatment cascade

- SPA not yet 1st line
- Direct therapy is best
- Nasal packing – if direct treatment fails
- Ligation or embolisation if packing fails
Introduction

- Around 20% of nose bleeds are posterior (Schaitkin, 1987)

- Posterior epistaxis poses a challenge. (O’Flynn and Shadaba, 2000)

- Failure rates of AP packing varies widely from 0% to 52% (Pollice PA, 1997. Cannon CR, 1993)

Introduction

- Transnasal endoscopic sphenopalatine artery (SPA) ligation has become a popular technique

- Published data suggest cessation of epistaxis in 90-100% of patients

- Individual study sample sizes are small, continuing audit of surgical outcome is required to validate these early results (Kumar et al, 2003)
Anatomy

Aim

- Review applied anatomy for SPA ligation
- Consider immediate anatomical relations
Ligation Hierarchy

- Ligate as close to bleed as possible
  - Sphenopalatine
  - Internal Maxillary
  - External Carotid
  - ? Anterior ethmoidal

Internal maxillary artery
Sphenopalatine artery anatomy
Endoscopic anatomy

Target: sphenopalatine foramen
Relations to neighbouring structures
Basic outline - matchbox ethmoid cavity

Anterior relations
Posterior relations

II

Vb

Vidian
Posterior septal branch
Posterolateral nasal artery

Fig. 3. The major feeding artery to the fontanelle. The major feeding arteries to the fontanelle were from the inferior turbinate branch in 23 cases (A), from the middle turbinate branch in 10 cases (B), directly from the posterior lateral nasal artery near the inferior turbinate in 9 cases (C), and from a single trunk to the middle turbinate branch to the fontanelle branch in 6 cases (D).
Instrumentation
Three Different Clip Applier Tips To Choose From:

- **Straight Tip**
- **Angle Tip 60°**
- **Right Angle Tip 90°**

**LC304**

- **LX105**
- **LX205**
- **LC307**

- **Clip Cartridges**
  - Color-coded to match the size of the clip applier.

- **Grooves on the Inside Jaw Surfaces**
  - Hold clip securely in place.

- **Load the Clip Applier**
  - With a simple, pencil-hold grip.

- **Lateral and Transverse Grooves on Inside of Clip**
  - Provides on-resewl security.

**Technique and pitfalls**
Endoscopic SPA ligation

- 3 techniques
  - Via a middle meatal antrostomy
  - Direct via middle meatus
  - Combined antroscopic approach

The MMA approach

- Infundibulotomy
- MMA
- Resect fontanelle
- Create tunnels
Accessory nasal artery 10%

Middle meatal approach

- Good if meatus wide
- May miss branches
- Avoids antrosotomy
Combined MMA & antroscopic approach

- Time consuming
- Access to main trunk
- Bi-manual technique
  - Antroscope
  - Ipsilateral nasal airway - instruments

Combined antroscopic approach
Combined antroscopic approach
Combined antroscopic approach

Technical Pitfalls of MMA approach
- Curvature
Technical Pitfalls

- Curvature
- Arterial trauma
Technical Pitfalls

- Curvature
- Arterial trauma
- Failed superior tunnel
- Failure to check for 2\textsuperscript{nd} branch

What should we have done?
Creating the superior tunnel
Results

Prospective Audit

To assess the following outcome measures of transnasal endoscopic SPA ligation:

1. Immediate postoperative cessation of epistaxis
2. Assess early and late recurrence
3. Morbidity and mortality
Methods

- Prospective audit of patients who underwent transnasal endoscopic SPA ligation
- Patients were treated in one of three centres between April 2003 and April 2006
- 46 patients (minimum 9 months follow up only included)

Patients

n = 46, 34 male, 10 female

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>68.5</td>
<td>37-100</td>
</tr>
<tr>
<td>Follow up (months)</td>
<td>15.8</td>
<td>9-24</td>
</tr>
<tr>
<td>Pre-operative stay (days)</td>
<td>2.3</td>
<td>1-4</td>
</tr>
<tr>
<td>Post-operative stay (days)</td>
<td>1.5</td>
<td>1-4</td>
</tr>
</tbody>
</table>
### Technique

<table>
<thead>
<tr>
<th>Method</th>
<th>% in total sample</th>
<th>% in patients with recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clips only</td>
<td>33</td>
<td>16.6</td>
</tr>
<tr>
<td>Diathermy only</td>
<td>12.5</td>
<td>50.4</td>
</tr>
<tr>
<td>Both</td>
<td>54.5</td>
<td>33</td>
</tr>
</tbody>
</table>

### Results

<table>
<thead>
<tr>
<th>Recurrence of epistaxis</th>
<th>No. of patients</th>
<th>Time of recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate post operative period (24 hours)</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>During inpatient stay</td>
<td>2</td>
<td>MA ligation conservative 3 &amp; 7 days</td>
</tr>
<tr>
<td>Post discharge - requiring medical attention</td>
<td>1</td>
<td>- angiography      5 days</td>
</tr>
<tr>
<td>Post discharge - not requiring medical attention</td>
<td>2</td>
<td>4 &amp; 10 months</td>
</tr>
</tbody>
</table>
M & M

- Morbidity: None
- Mortality: (2 patients)

Patient 1: ARDS
Patient 2: 100 years old, HF

Literature

<table>
<thead>
<tr>
<th>Literature</th>
<th>patients</th>
<th>arteries</th>
<th>f/up in month</th>
<th>Success %</th>
<th>complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rowe-Jones, 1998</td>
<td>10</td>
<td>11</td>
<td>9</td>
<td>100</td>
<td>none</td>
</tr>
<tr>
<td>O’Flynn et al, 2000</td>
<td>12</td>
<td>14</td>
<td>9</td>
<td>100</td>
<td>none</td>
</tr>
<tr>
<td>Voegels, 2001</td>
<td>11</td>
<td>12</td>
<td>-</td>
<td>100</td>
<td>none</td>
</tr>
<tr>
<td>Ram et al, 2000</td>
<td>6</td>
<td>6</td>
<td>-</td>
<td>92</td>
<td>none</td>
</tr>
<tr>
<td>Snyderman et al, 1992</td>
<td>38</td>
<td>38</td>
<td>10</td>
<td>92</td>
<td>Crusting (34%), palatal numbness (13%)</td>
</tr>
<tr>
<td>Abdelkader et al, 2007</td>
<td>43</td>
<td>45</td>
<td>Up to 24 (mean 15.3)</td>
<td>(93.4%)</td>
<td>none</td>
</tr>
</tbody>
</table>
Conclusions

- Both post operative and long-term success rates for the procedure are lower than previously published data
- Recurrence of epistaxis requiring active intervention occurred within one month of the procedure in all of the cases where the procedure failed
- No incidence of failure in the long term found (after 12 month)

Conclusions

- Endoscopic intranasal clipping of the SpA is a reliable procedure in controlling posterior epistaxis but has a consistent failure rate ~ 10%
- Failures occur within a month of ligation
Endoscopic control of the sphenopalatine artery for epistaxis: long-term results.

Abdelkader M, Leong SC, White PS

Department of Otolaryngology, University of Dundee, Ninewells Hospital and Medical School, Dundee, Scotland, UK.

The aim of this study was to prospectively evaluate post-operative cessation of bleeding and late recurrence of epistaxis in a cohort of patients treated by endoscopic ligation of the sphenopalatine artery. Participants comprised patients undergoing sphenopalatine artery ligation for posterior epistaxis at three east Scotland hospitals. Main outcome measures were recurrence of epistaxis in the immediate post-operative period and at long-term follow up (minimum nine months). Forty-three patients (30 men and 13 women) underwent 45 procedures; two patients underwent bilateral ligation. Two patients suffered recurrence as in-patients. Two patients experienced subsequent epistaxis requiring medical treatment. Two further patients suffered minor late epistaxis not requiring treatment. Success in preventing significant recurrence was 93 per cent. All recurrences requiring intervention occurred within one month of surgery. None of the patients in this series reported nasal complications. We found sphenopalatine artery ligation to be an effective means of achieving long-term control of posterior epistaxis.

PMID: 17201991 [PubMed - as supplied by publisher]
Questions

Thank you

Email: maged.abdelkader@btuh.nhs.uk