External Carotid Artery Embolization

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Introduction

Embolization of lesions fed by branches of the external carotid artery (ECA) has become a common and accepted practice to provide primary or adjunctive therapy of lesions fed by this arterial territory. Primary therapy is intended to effect a resolution of the problem via ECA embolization alone. Adjunctive therapy is usually performed before surgery to reduce blood loss, facilitate lesion removal, and reduce surgical risk (1).

The following guidelines are intended for use in quality improvement programs to evaluate ECA embolizations. Assessment guidelines include indications for embolization, success rates for achieving embolization goals, and complication rates.

Discussion

ECA embolization may be defined as endovascular occlusion of branches of the ECA in an attempt to terminate or reduce blood flow to a lesion in the head, neck, or skull base region. The procedure is usually performed in conjunction with diagnostic angiography and most often is completed in one session.

The embolic materials most commonly used in this arterial distribution are particulate materials (ie, polyvinyl alcohol sponge particles; Gelfoam sponge or powder; Avitene; Embospheres; pushable, fibered or nonfibered coils; electronically detachable, mechanically detachable, or injectable coils) (2, 3). Liquid agents include acrylic adhesives and sclerosants such as absolute alcohol and hypertonic glucose. The choice of the embolic agent is made on the basis of the intended goal of embolization (preoperative versus primary therapy), the inclusion of normal tissue in the embolic field, and the level of performance necessary. All liquid agents and small particles (smaller than approximately 200 μm) penetrate deeply into small normal vessels and may create severe ischemia, resulting in undesirable side effects such as skin necrosis and cranial nerve palsy. These unfavorable effects may be reduced by careful evaluation of superselective angiograms and provocative pharmacologic testing before embolization (4).

Indications

The common indications for ECA embolization are the primary treatment of a disease process affecting the vascular territory of the ECA (eg, epistaxis, arteriovenous fistula [AVF]) or the adjunc-
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<table>
<thead>
<tr>
<th>Indicator</th>
<th>Threshold (%)</th>
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<tbody>
<tr>
<td>Nerve palsy (unintentional and nerve not targeted for resection)</td>
<td></td>
</tr>
<tr>
<td>Transient</td>
<td>&gt;2</td>
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<tr>
<td>Permanent</td>
<td>&gt;1</td>
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<tr>
<td>Neurologic deficit</td>
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<tr>
<td>Major permanent</td>
<td>&gt;1</td>
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<tr>
<td>Minor permanent</td>
<td>&gt;2</td>
</tr>
<tr>
<td>Transient</td>
<td>&gt;3</td>
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<tr>
<td>Death</td>
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</table>

References