A Study in to the Benefits of Bilateral Nasal Packing for Epistaxis

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INTRODUCTION

Epistaxis is one of the most common emergency otorhinolaryngological presentations. Once presenting for medical attention, the primary treatment modality is normally the identification of the bleeding point and control through cautery, whether chemical or electrical. However, in a substantial proportion of cases, it may not be possible to adequately identify or control the primary bleeding point. In these cases the next step, in terms of treatment, is often nasal packing. One of the most commonly used packs for the satisfactory management of anterior epistaxis is the RapidRhino™ (Arthrocare ENT).

Unfortunately, as with any nasal pack, RapidRhino usage can be associated with significant discomfort (1), particularly as the pack is inflated. Anecdotal evidence suggests that in situations where patients are able to tolerate complete obstruction of the nose, it may be more effective and comfortable to use bilateral nasal packing from the outset, reducing septal deflection.

METHODS AND MATERIALS

A simplified model of the nasal cavity was constructed using two 95 x 50 x 50mm translucent plastic boxes, arranged so as to form the lateral, superior and inferior boundaries. The midline septum was created using a sheet of silicone, 4mm thick, secured in the midline by the placement of several bolts passing through the nasal cavity. The inferior, superior and posterior borders of the sheet were secured in place by the edges of the boxes used to make the nasal cavity. Whilst this secured the ‘septum’ in position, it allowed it to be freely deflected by pressure application from either side of the ‘nasal cavity’.

7.5cm RapidRhino™ packs were inserted in to the ‘nares’ and inflated, in a range of configurations, to a range of pack pressures: 120 mmHg, 140 mmHg, 160 mmHg, 180 mmHg and 200 mmHg.

Initially, unilateral packs were used, with the same ‘nostril’ being used on each occasion; the deflection of a point, marked in the midline of the model septum, was measured at a range of 0 mmHg. This was done by measuring the distance from each lateral edge of the model, to the marked midline point, reciprocal measuring ensuring accuracy of the readings taken (Side A and Side B). Inflation to each pressure was repeated 20 times, with full deflation of the pack in between inflations, again to ensure accurate, replicable readings were obtained.

RESULTS

<table>
<thead>
<tr>
<th>Inflation Pressure (mmHg)</th>
<th>0</th>
<th>120</th>
<th>140</th>
<th>160</th>
<th>180</th>
<th>200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packing</td>
<td>Uni</td>
<td>Bil</td>
<td>Uni</td>
<td>Bil</td>
<td>Uni</td>
<td>Bil</td>
</tr>
<tr>
<td>Mean Deflection (mm)</td>
<td>0</td>
<td>0.8</td>
<td>0.35</td>
<td>0.45</td>
<td>0.35</td>
<td>0.95</td>
</tr>
<tr>
<td>SD</td>
<td>0</td>
<td>0.41</td>
<td>0.49</td>
<td>0.51</td>
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<td>0.51</td>
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<tr>
<td>0</td>
<td>0</td>
<td>20</td>
<td>20</td>
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</tr>
<tr>
<td>N/A</td>
<td>0.0032</td>
<td>0.5309</td>
<td>0.0075</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td></td>
</tr>
</tbody>
</table>

DISCUSSION

It has been successfully demonstrated that bilateral nasal packing, with like-for-like pressures, results in significantly reduced nasal septal deviation when compared to unilateral packing, possibly indicating a more comfortable patient experience. However, the patient’s general health and co-existing medical conditions must be taken in to account: for example, there is evidence that bilateral nasal packing, and nasal obstruction, may be detrimental to the respiratory function of patients with chronic respiratory problems (3).

We recognize there are limitations to our experiment: firstly, though our model does demonstrate the movement of the nasal septum, it does not take in to account any movement of the lateral nasal wall, particularly the effect of pressure on the turbinates. In addition, whilst we tried to make our nasal septum as close an analogue as possible, to the real nasal septum, we recognize that a silicone sheet will have different mechanical properties to sepal bone and cartilage. In this experiment we also assume that the degree of septal deformity is analogous to increased pain, though this has not been proven in the literature. Finally, despite trying to ensure that our measurements of both pressure and septal deflection were as accurate as possible, through repeated measurements.

A redesigned experimental model, ensuring anatomical accuracy and looking in to the effect on the lateral nasal wall, as well as the septum, could address these limitations. In addition, consideration should be given to the conduction of in vivo studies, measuring patient discomfort with each packing method.

REFERENCES