Anatomic evaluation of the Montgomery® Thyroplasty Implant System

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Introduction

The concept of vocal cord medialization to treat vocal cord paralysis was first introduced early in the twentieth century. (1) This technique was later formalized as type I or medialization thyroplasty, (2) and has subsequently been shown to improve dysphonia secondary to vocal cord paralysis or atrophy after chordotomy. (3,4) Long-term follow-up. (4)

Type I thyroplasty as it was originally described (2) involves inserting a piece of cartilage through a window cut in the thyroid cartilage to medialize the vocal cord. This technique has been modified to use a variety of artificial implant materials. (5,6)

Methods

Experimental anatomic study in fixed human cadavers. Medialization thyroplasty was performed using the Montgomery® Thyroplasty implant system on each side of every male and female human cadaver specimen.

The location of the implant was compared to the predicted position, which was defined as the position that should result in maximal medialization of the true vocal cord. Measurements were taken in the horizontal and vertical planes from anatomic landmarks. The data was analyzed using the paired Student’s t-test.

Results

In the male specimens, the difference (mean plus or minus standard deviation) in position of implant with respect to predicted was 1.1 plus or minus 0.8 mm (range, 0 to 3 mm). In the female specimens, the mean difference in position of implant with respect to predicted was 1.3 plus or minus 1.1 mm (range, 0 to 4 mm). There was no statistically significant difference between predicted and measured position for either group (P greater than 0.05).

Conclusions

The Montgomery® Thyroplasty Implant System results in precise placement of the thyroplasty implant in a human cadaver model.

References


Discussion

• The Montgomery® Thyroplasty Implant System results in precise placement of the thyroplasty implant in a human cadaver model.
• Further research is warranted to assess placement in live humans, and more importantly, to determine the effect of position on functional outcomes.

Figure 1: Montgomery® Thyroplasty Implant System Instrument Set

Figure 2: Montgomery® Thyroplasty implant system measuring devices above, and corresponding implants below (9)

Figure 3: Internal surface of specimen marked to show predicted location of implant (black circles) along with anatomic landmarks used for measurements (white circles)

Figure 4: Internal surface of specimen with pins passed through from external surface to show location of cartilage window. Anatomic landmarks used for measurements marked with white circles.

Table 1: Results

<table>
<thead>
<tr>
<th>Sex</th>
<th>Difference (mm)</th>
<th>P-value</th>
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<tbody>
<tr>
<td>Male</td>
<td>1.1 ± 0.8</td>
<td>0.3</td>
</tr>
<tr>
<td>Female</td>
<td>1.3 ± 1.1</td>
<td>0.4</td>
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</tbody>
</table>

Table 1 shows the calculated difference between predicted and actual location of implant.

There was no statistically significant difference between predicted and actual location of implant for the male or female specimens.