Surgical management of airway dysfunction in Parkinson’s Disease compared with Parkinson-plus syndromes

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ABSTRACT

Objectives
1. To compare the laryngeal symptoms of Parkinson’s disease (PD) with those of multiple system atrophy (MSA), a Parkinson-plus syndrome (PPS).
2. To review the differences in surgical management of upper airway dysfunction in PD versus MSA.
3. To present a treatment algorithm for management of upper airway disorders in PD and MSA.

Methods
Case series of 30 patients (24 with PD, 6 with MSA). Data analyzed included airway manifestations of each disease including clinical and physiological test results and management outcomes.

Results
Vocal cord atrophy causing bowing with mid-cord glottic gap was common in PD patients. One third of PD patients underwent vocal cord augmentation with noticeable improvement in vocal volume and phonation time. Tracheostomy was required in 50% MSA patients for life threatening sleep apnea. Systemic medications and speech therapy were integral components of the management regime.

Conclusions
Surgical management of laryngeal disorders in PD should focus on restoring bulk to atrophic vocal cords to minimize glottic gaps, thus improving vocalization efficiency even in the presence of impaired respiratory effort. Conversely, the autonomic dysfunction that characterizes MSA results in upper airway obstruction and thus surgical management focuses primarily on maintaining an adequate airway and frequently necessitates tracheostomy.

METHODS AND MATERIALS

Retrospective case series of 30 patients (6 MSA, 24 PD) with clinical evidence of vocal or breathing abnormalities.

All patients underwent a functional laryngeal examination with fiberoptic direct laryngoscopy with or without pulmonary function testing (PFT) and evaluation for sleep apnea in the sleep laboratory.

Outcome measures
Patient demographics
Upper airway disease manifestations
Management specifics including surgical and non-surgical interventions

Primary outcome of surgical intervention: hypophonia improvement

An algorithm for management of upper airway disorders in PD versus MSA was constructed.

RESULTS

Table 1. Patient and disease characteristics

<table>
<thead>
<tr>
<th>Disease classification</th>
<th>N (%)</th>
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<tbody>
<tr>
<td>Parkinson’s Disease</td>
<td>24 (80.0)</td>
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<tr>
<td>Parkinson Plus Syndrome</td>
<td>6  (20.0)</td>
</tr>
<tr>
<td>Male</td>
<td>20 (66.7)</td>
</tr>
<tr>
<td>Female</td>
<td>10 (33.3)</td>
</tr>
<tr>
<td>Dysarthria</td>
<td>20 (66.7)</td>
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<tr>
<td>Laryngoscopy findings</td>
<td></td>
</tr>
<tr>
<td>Asymmetric vocal fold motion</td>
<td>20 (66.7)</td>
</tr>
<tr>
<td>Paradoxical vocal fold motion</td>
<td>10 (41.7)</td>
</tr>
<tr>
<td>Bowed vocal cords</td>
<td></td>
</tr>
</tbody>
</table>

Age (years) Median (range)

60 (41-84)

PD Parkinson’s Disease, PPS Parkinson-plus syndrome, OSA obstructive sleep apnea

Surgical intervention included vocal cord augmentation in 3 MSA patients (50.0%) required tracheostomy for airway obstruction secondary to severe OSA.

No MSA patient received vocal cord augmentation surgery due to airway concerns.

All PD patients with bowed vocal cords and normal PFT (n=8) underwent vocal cord injection augmentation.

6 patients (75.0%) had improved vocal loudness >50% of baseline postoperatively (Figure 1a,b).

CONCLUSIONS

Appropriate surgical management of dysphonia for PD versus MSA patients is different and requires that surgeons have knowledge of the main airway issues related to these two disease processes.

Sleep studies are essential when evaluating patients with MSA as tracheostomy is the most common surgical intervention.

PFTs for PD patients in combination with laryngoscopy will assist in selecting those who may benefit from vocal fold augmentation.

REFERENCES