Supraglottic airway devices (SADs) continue to gain popularity and are increasingly used in anesthetic practices. However, the efficacy and safety of SADs for laparoscopic surgery are disputed. Although not traditionally used in laparoscopic surgery, SADs offer several benefits for appropriately selected patients.

**EVLOLUTION OF THE SAD**

Since the invention of the first SAD, the device has undergone several design advancements that improve its safety profile. The classic laryngeal mask airway developed by Teleflex (Wayne, PA) was one of the first SADs. It had a relatively simple design, but it revolutionized the concept of airway management as it allows for a hands-free approach to ventilation and bypasses upper airway obstruction relative to the facemask. Innovation has led to the creation of second-generation SADs, which allow for higher oropharyngeal leak pressures. This improvement allows for better protection against regurgitated gastric contents and reduces aspiration risk. In addition, it allows for the delivery of more successful positive pressure ventilation.

**SUPRAGLOTTIC AIRWAY AND HEMODYNAMICS**

One potential benefit of SADs in laparoscopic surgery is improved hemodynamic stability. In a study that assessed hemodynamics and catecholamine levels in obese patients undergoing laparoscopic gastric banding, patients randomized to receive an endotracheal tube (ETT) rather than a SAD had higher blood pressure and higher circulating catecholamine levels throughout the procedure than those in the SAD group. High catecholamine levels can increase a patient’s heart rate, which may impair myocardial oxygen delivery. They also lead to a prothrombotic state. The increase of catecholamines can exacerbate perioperative complications; therefore, SADs are an appealing alternative in certain high-risk populations. Placement of the SAD leads to less sympathetic stimulation and has the potential to require less anesthetics, avoiding reductions in systemic vascular resistance and myocardial depression. The combination of a catecholamine surge and increased anesthetic requirements for ETTs can further lead to hemodynamic alterations that may not be well tolerated in certain patient populations.

**COMPARING SAD VS. ETT OUTCOMES**

Another potential benefit of SADs over ETTs is that SADs may be associated with less airway morbidity than the ETT. The incidence of sore throat in the ambulatory surgical setting was found to be 45.5% in patients with an ETT compared to 17.5% in patients with an SAD in a meta-analysis of randomized controlled trials comparing the SAD and ETT in patients undergoing elective laparoscopic surgery, there was a higher incidence of laryngospasm, dysphagia, sore throat, and hoarseness in the ETT group. Similarly, pediatric patients undergoing anesthesia with recent upper respiratory infections are at an increased risk for respiratory complications, even in a high risk group for bronchospasm, laryngospasm, and desaturation. Furthermore, studies mentioned above suggest reduced patient airway complaints associated with SADs as well as a reduction in airway complications.

The reductions in airway morbidity and fewer hemodynamic disturbances may contribute to earlier discharge times in patients who undergo airway management with SADs. In a randomized controlled trial that assessed postanesthesia care unit (PACU) and hospital length of stay, patients who received a SAD during their anesthetic for laparoscopic gastric banding met PACU discharge criteria 17 minutes earlier than those patients who received an ETT for their anesthetic.
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gastric contents from the airway and serve as a conduit for gastric tube placement.1,2 SADs have been successfully used without evidence of aspiration in appropriately selected patients undergoing laparoscopic surgery.15

CONCLUSION

Second-generation SADs are a safe alternative for laparoscopic surgeries in appropriately selected patients. They are better than the first-generation SADs at protecting against gastric insufflation and aspiration. They also have improved ventilation that is effective even with pneumoperitoneum (Table 2). Anesthesia professionals may need to discontinue the use of first-generation devices in laparoscopic surgery due to the lower oropharyngeal leak pressures and increased incidence of gastric insufflation if improperly sealed. Otherwise, SADs may offer a variety of benefits over ETTs in laparoscopic surgery including improved hemodynamic stability, a reduced risk of perioperative respiratory complications, reduced airway morbidity, and they may even contribute to earlier hospital discharge. Second-generation SADs have many benefits that warrant their use in laparoscopic surgery.

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SADs (Cont’d)

Table 1: Patient Characteristics Indicating SAD Use14,17,20

<table>
<thead>
<tr>
<th>Beneficial for:</th>
<th>Controversial for:</th>
<th>Contraindicated for:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fasted patients</td>
<td>• Patients with morbid obesity</td>
<td>• Unfasted patients</td>
</tr>
<tr>
<td>• Patients with a BMI &lt;30</td>
<td>• Patients with a BMI &gt;40</td>
<td>• Patients at high aspiration risk</td>
</tr>
</tbody>
</table>

BMI, body mass index; SAD, supraglottic airway device.

Table 2: Potential Benefits of SADs12,46,97

<table>
<thead>
<tr>
<th>Potential Benefits</th>
<th>Added Potential Benefits of Second-generation SADs</th>
</tr>
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<tbody>
<tr>
<td>• Reduced airway morbidity: sore throat, dysphagia, hoarseness</td>
<td>• Improved oropharyngeal leak pressure</td>
</tr>
<tr>
<td>• Improved hemodynamic stability</td>
<td>• Ability to provide PPV</td>
</tr>
<tr>
<td>• Reduced PACU and hospital stay</td>
<td>• Gastric drainage port</td>
</tr>
<tr>
<td>• Fewer respiratory complications</td>
<td>• Ability to pass orogastric tube</td>
</tr>
</tbody>
</table>

PACU, postanesthesia care unit; PPV, positive pressure ventilation; SAD, supraglottic airway device.

REFERENCES


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