ABSTRACT

Educational Objective: At the conclusion of this presentation, the participants should be able to describe techniques used to provide hemostasis during endoscopic skull base surgery, including the use of the bipolar sealer during transsphenoidal pituitary tumor resection.

Objectives: During endoscopic skull base surgery, hemostasis is an important factor in determining length of operation, rate of surgery abortion, and success of tumor resection. The bipolar sealer is a relatively new device that uses a combination of radiofrequency energy and saline to seal blood vessels while maintaining temperatures <100 C. It was our objective to describe the use of a bipolar sealer in managing bleeding in endoscopic transsphenoidal resection of pituitary tumors. Study Design: Retrospective case series and review of the literature.

Methods: Intraoperative data and surgical outcomes were collected from charts of patients that underwent transnasal transsphenoidal resection of pituitary tumors. All interventions used the bipolar sealer (Aquamants Mini EVS 3.4 Epidural Vein Sealer) to provide hemostasis.

Results: Five patients were included; three were female, with an average age of 48 years. All tumors were resected successfully with an average estimated blood loss of 49 ml and no transfusion requirements. No postoperative complications occurred during followup including hemorrhage, infection, and CSF leaks.

Conclusions: The bipolar sealer has mainly been used for hemostasis in orthopedic procedures such as knee and hip arthroplasty. In the literature, its use has not yet been described on the dura or brain parenchyma. Ergonomically, the device was found to be well suited for endoscopic skull base surgery with its long fixed bayonet providing bipolar current without requiring parts to small areas of tissue. The bipolar sealer was found to work best on the venous plexus of the dura, but was less effective on the gland itself.

INTRODUCTION

The endoscopic transphenoidal approach (TSA) to the skull base has been shown to be effective compared to the traditional microscope assisted TSA.

Complications for the TSA which include:

Hemorrhage
Infection
CSF leaks
Sinonasal injury
Orbital/ophthalmic nerve injury
Ophthalmoplegia
Anosmia
DI/SIADH
Conversion to craniotomy

Bleeding becomes more likely in lateral dissection into the cavernous sinus to resect larger tumors

During TSA hemostasis is an important factor in determining length of operation, rate of surgery abortion, and success of tumor resection

Current methods for bleeding control: gentle pressure suction cautery/bipolar cautery bone wax gelatin sponges (GelFoam) matrix hemostatic sealant (FloSeal)

METHODS AND MATERIALS

Study Design: Retrospective case series and review of the literature.

All interventions used the bipolar sealer (Aquamants Mini EVS 3.4 Epidural Vein Sealer) to provide hemostasis

SURGICAL TECHNIQUE

1. All patients had a septoplasty in order to obtain visualization to the sphenoid sinus. Bone and cartilaginous segments of the septum are resected

2. Rostrum of the sphenoid is removed and the natural ostium of both sphenoids are identified and the bony tissue between them resected

3. Inter-sinus septum is taken down and the sella is identified and entered

4. The dura becomes visible and the bipolar sealer (Aquamants Mini EVS 3.4 Epidural Vein Sealer) is utilized to cauterize the dura

RESULTS

<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>Reoperation</th>
<th>EBL (ml)</th>
<th>Tumor Size (cm)</th>
<th>Histology</th>
<th>Complications</th>
</tr>
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<tbody>
<tr>
<td>54</td>
<td>M</td>
<td>N</td>
<td>35</td>
<td>1.8</td>
<td>Pituitary</td>
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<tr>
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<td>M</td>
<td>Y</td>
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<tr>
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<td>F</td>
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</tr>
<tr>
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<td>F</td>
<td>N</td>
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</tr>
<tr>
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<td>F</td>
<td>N</td>
<td>100</td>
<td>1.8</td>
<td>Pituitary</td>
<td>None</td>
</tr>
</tbody>
</table>

Table 1. Outcomes of TSA Patients using Bipolar Vein Sealer

The average patient age was 48.8 years

Tumors were confined to the sella turcica with an average tumor size of 2.1 cm

Average EBL was 49 ml, with the reoperation patient having the lowest EBL of 10 ml

No postoperative complications, including bleeding and CSF leaks, were found

DISCUSSION

Small amount of bleeding can lead to increased operative time, premature abortion of surgery, and decreased visibility

Bipolar sealer is particularly useful on the dural surface of the pituitary, especially the venous plexus

It was less effective within the substance of the tumor

The bipolar sealer has been used in other surgical settings for hemostasis, particularly in the field of orthopedic surgery.

CONCLUSIONS

Ergonomically the bipolar sealer is well suited for the endoscopic field

Future studies directing comparing the bipolar sealer to tradition hemostatic techniques would be useful

REFERENCES


