

**Prospective Study to Evaluate Outcomes from Trans-oral Base of Tongue Resection  
for Obstructive Sleep Apnea Hypopnea Syndrome (OSAHS)**

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## 1.0 STUDY SCHEMA

Patients with obstructive sleep apnea hypopnea syndrome (OSAHS) who are candidates for base of tongue (BOT) resection.



Informed consent obtained



Patient enrolled into study



Surgery



Patient Follow-up  
1. Post Op pain diary  
2. First post-operative visit.  
3. Routine 3-month follow-up.

## 2.0 SUMMARY

This is a prospective observational study that will collect outcome data for patients who choose to undergo transoral robotic assisted tongue base operations for Obstructive Sleep Apnea Hypopnea Syndrome (OSAHS). The da Vinci® Robotic Surgical System (Intuitive Surgical) is the system used at the University of Alabama at Birmingham (UAB) and will be utilized for this study.

## 3.0 BACKGROUND AND RATIONALE

Obstructive sleep apnea hypopnea syndrome (OSAHS) is a major public health problem, and studies suggest that the incidence of OSAHS may be even higher than estimated.

Transoral base of tongue resections are commonly preformed to improve symptoms in OSAHS, but among surgeons there is not yet consensus as to the best tongue base operation. The difficulty in treating the tongue base is illustrated by the abundance of available procedures – including genioglossus advancement, hyoid advancement, tongue base suspension, radiofrequency treatment, transoral midline glossectomy, submucosal coblation-assisted tongue base resection and recently; transoral robotic-assisted surgery (TORS) for base of tongue (BOT) resection. We will evaluate TORS BOT resection for use in OSAHS by assessing pre- and post-operative OSAHS scores and comparing them to historical data for alternative BOT operations.

Though routine, BOT resection may result in significant post-operative pain leading to dysphagia. In certain patients, major complications such as aspiration pneumonia, malnutrition and dehydration can occur as a result. Thus, reducing post-operative dysphagia is critical to improving patient outcomes and limiting complication-associated hospital admissions. Several studies have addressed the management of post-operative dysphagia, but none have evaluated TORS BOT resections in OSAHS. Additionally, TORS BOT resections for malignant neoplasms have been previously shown by Dr. Magnuson and Dr. Carroll to be safe and feasible. An outcome analysis of TORS BOT resections for OSAHS may therefore yield recommendations for reducing patient morbidity and mortality.

To evaluate TORS BOT resection as a treatment for OSAHS; patients will serve as their own controls by undergoing assessment for OSAHS pre- and post-operatively. We will characterize patient morbidities associated with surgical correction of OSAHS by reviewing data collected during regularly scheduled follow-up visits (Appendix A), and by patient pain diaries (Appendix B). In addition, we will independently assess dysphagia using the M.D. Anderson Dysphagia Inventory (Appendix C). Our goal is to improve quality of life for future OSAHS patients undergoing BOT resection.

While previous publications have documented the use of robotic assisted oropharyngeal surgery, the transoral approach is considered off-label use of robotic assisted surgery. Currently the transoral approach is being performed at UAB for oropharynx surgery (HNO 0601). Therefore, we are proposing to perform a series of tongue base resections

in 40 patients to assess this technique at the University of Alabama at Birmingham. The Division of Otolaryngology sees many OSAHS patients a year that would be candidates for operative intervention using the *robotic assisted surgery*. A robotic surgical system is available for this purpose and is currently used by multiple specialties at the University Hospital.

#### **4.0 OBJECTIVES:**

##### **4.1 Primary Objective:**

The primary objective of this study will be to determine if base of tongue (BOT) resection with transoral robotic-assisted surgery (TORS) yields improvements in OSAHS with reduction in apnea/hypopnea index.

#### **5.0 TRIAL DESIGN**

This trial is a single institution non-randomized study to evaluate the efficacy and safety of transoral robotic-assisted surgery (TORS). We propose to use the da Vinci ® Robotic Surgical System which is currently in place at UAB to perform surgical resection in 40 patients with OSAHS.

Patients with OSAHS, who present to the Division of Otolaryngology and are scheduled for base of tongue surgery and enrolled to this study, will be given a pain diary to start the morning of surgery to continue for a total of two weeks following surgery. Patients will also be asked to complete the MD Anderson Dysphagia Index (MDADI) swallowing questionnaire to be done prior to surgery, at their post operative clinic visit and at approximately three months following surgery. A sleep study will be done two to three months following surgery if allowed by participant's insurance carrier. A medical record review will be done on all participants who complete the diary and questionnaire.

#### **6.0 PATIENT SELECTION CRITERIA**

##### **6.1 Eligibility Criteria**

1. Any patient with documented OSAHS who is scheduled for tongue base resection at UAB.
2. Age > 19 years
3. Patients must sign informed consent

##### **6.2 Exclusion Criteria**

1. Psychological condition that renders the patient unable to understand the informed consent.
2. Any situation or condition that will interfere with adherence to study activities.

## **7.0 REGISTRATION**

Patients must not start protocol treatment prior to formal registration and informed consent.

### **7.1 Patient Consent**

Patients thought to be candidates for this protocol will be identified by his/her physician. The study will be explained to the patient and a consent form will be given for review.

### **7.2 Patient Screening**

Patients who agree to participate in the study and have signed informed consent will undergo patient screening.

### **7.3 Patient Registration**

Patients, who have signed the informed consent and meet the eligibility criteria, will be entered into the study prior to any protocol therapy. The following information will be required at the time of patient entry:

- Patient's name (or initials) and ID #, hospital chart number
- Verifying Physician's Name
- Eligibility Criteria Information
- Demographic Data (sex, birth, date, race, nine-digit zip code, and method of payment)

## **8.0 STUDY TREATMENT**

Robotic assisted surgery will be performed in standard fashion. If at any point during the procedure the area for resection is not well visualized, or the resection is compromised, or the procedure is felt to be unsafe (for example potential injury to teeth or gums), the procedure will be aborted. Participants will then be presented an alternative treatment plan for this condition.

Post-operative care and discharge will be performed in the routine manner for OSAHS. Medical records will be reviewed from this period of routine care to determine what effects, good and/or bad, this procedure has on the patient. These records will include hospital and clinic records such as clinic and hospital notes, anesthesia notes, radiological imaging and speech pathology information. Patients will be followed post-operatively using standard practice.

## **9.0 ADVERSE EVENT REPORTING**

### **9.1 Potential treatment hazards**

9.1.1 Injury to perioral structures during the surgical procedure. Use of the robot in transoral surgery has been demonstrated to be safe in a limited data set. However, the use of oral instrumentation for access to base of tongue resections can result in injury to teeth, gums and/or the tongue. The standard risks of surgery include post operative pain and discomfort, bleeding, infection, post operative pneumonia, laryngeal and pharyngeal swelling, difficulty in swallowing, injury to nerves and blood vessels failure to perform resection and adverse reactions or complications from anesthesia. Although very rare, with any surgery there is a risk of life threatening events that may result in persistent or significant disability/incapacity or death. In some cases, a feeding tube may be placed to ensure adequate nutrition and fluid intake. On rare occasions, severe throat edema may require prolonged intubation or re-intubation. There is also a rare risk for instrument breakage and power outage resulting in a shutdown of transoral diagnostic and therapeutic surgical equipment. UAB has backup precautions for these types of situations. It is felt that the use of the robotic assisted surgery will not add additional risks to the standard surgical risks.

9.1.2 Need for additional surgery in cases where TORS cannot be adequately performed.

9.1.4 Confidentiality: As a participant in a UAB protocol that collects data on patients including personal information and disease related information, there is a potential for breach of patient confidentiality.

### **9.2 Reporting adverse events**

#### **9.2.1 Expedited reporting methods**

Unexpected or serious adverse events (SAE) are to be reported immediately to Dr. Kirk Withrow (205) 934-9765; UAB Paging Operator (205) 934-3411. The SAE reporting period begins with signing of the informed consent. Any event that is both serious and unexpected must be reported to UAB's Institutional Review Board for Human Use within 24 hours after the investigator's initial receipt of the information. A written report must follow in 10 working days of the report.

#### **9.2.2 Adverse event reporting definitions**

In the event of an adverse event the first concern will be for the safety of the subject. Serious adverse events to be reported is

defined as any sign, symptom or medical condition that emerges during surgery through a period of 30 days following surgery that (1) was not present prior to surgery and is not a chronic condition that is in the patient's medical history OR (2) was presented prior to surgery but worsened as a result of surgery, AND that meets any of the following regulatory serious criteria:

- Results in death
- Is life-threatening
- Requires or prolongs inpatient hospitalization
- Is disabling
- Is a congenital anomaly/birth defect
- Is medically significant or requires medical or surgical intervention to prevent one of the outcomes listed above.

#### **9.2.3 Adverse event that does not require expedited reporting**

Any hospitalization for needed additional surgery or additional treatment of the disease for OSAHS or supportive care for disease that is unrelated to surgery such a PEG tube placement does not require expedited reporting.

#### **9.2.4 Safety Monitoring**

- Dr. Kirk Withrow will be responsible for review of the data. If at any time it is determined that the risks of participation outweigh the benefits, the study will be reviewed by Dr. Withrow and the research staff.
- Participant information and adverse events will be evaluated as deemed necessary at the meetings of the Office of Clinical Research for the UAB Division of Otolaryngology – Head and Neck Surgery.
- All events determined to be Serious Adverse Events, whether related to the study procedure or not, will be reported to the Institutional Review Board at UAB.

### **10.0 SUBJECT EVALUATIONS**

#### **10.1 Baseline evaluations:**

1. Routine medical exam prior to surgery.
2. Dysphagia survey prior to surgery.
3. OSAHS evaluation

**10.2** Pain Diary to be completed by participant daily starting with the day of surgery through 2 weeks post op.

**10.3** Routine follow up exams for three months: (post operative exam and three month follow up exam)

1. Routine medical exam.
2. Assessment for adverse events.
3. Dysphagia survey.
4. OSAHS evaluation (including sleep study if allowed by participant's insurance).

## **11.0 REFERENCES:**

1. Boudreaux BA, Rosenthal EL, Magnuson JS, Newman JR, Desmond RA, Clemons L, Carroll WR. Robot-assisted surgery for upper aerodigestive tract neoplasms. *Arch Otolaryngology Head Neck Surg* 2009 Apr; 135 (4):397-401.
2. Iseli TA, Kulbresh BD, Iseli CE, Carroll WR, Rosenthal EL, Magnuson JS. Functional outcomes after transoral robotic surgery for head and neck cancer. *Otolaryngol Head Neck Surg* 2009 Aug; 141(2):166-71