



Comparison of Margin and Survival between Transoral Robotic Surgery (TORS) and Non-Robotic Endoscopic Surgery for Oropharyngeal Cancer

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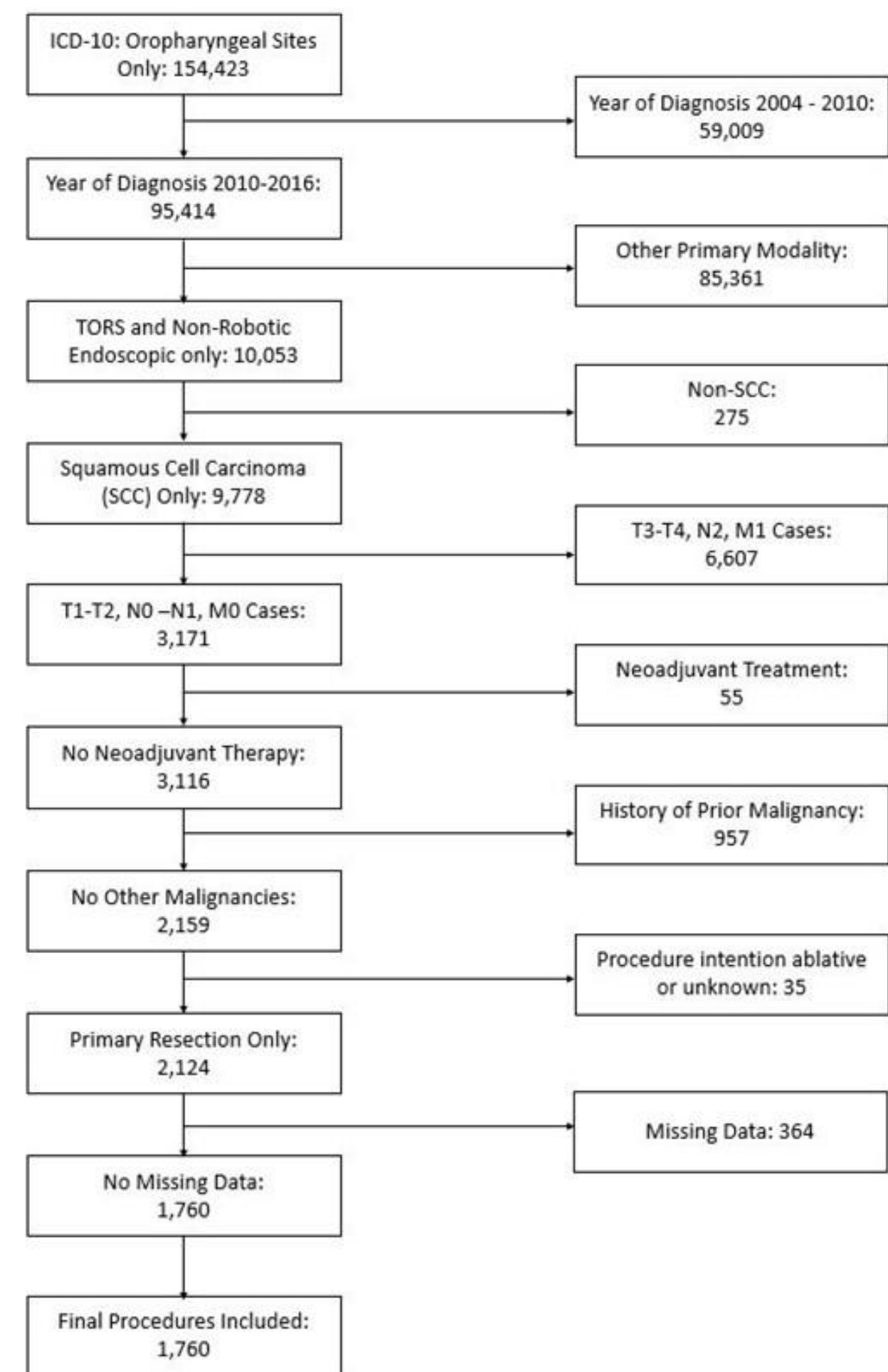
Objective

To evaluate the impact of transoral robotic surgery (TORS) and non-robotic transoral endoscopic surgery (NRES) on margin positivity, rates of adjuvant therapy and survival in early-stage oropharyngeal squamous cell carcinoma (SCC).

History of Transoral Cancer Surgery

- **1950's – Huet describes first transoral surgical approach for oropharyngeal cancer**
 - Treatment of head and neck cancer becomes minimally invasive for the first time
- **1990's – Invention of transoral laser microsurgery (TLM)**
 - TLM endoscopic surgery allows for primary resection of tumors at the base of the tongue
- **2005 – Rise of transoral robotic surgery (TORS)**
 - TORS provides improved access and visibility of the oropharynx, letting surgeons perform en-bloc resections
- **Today – Refinement of surgical techniques**
 - Oncologic outcomes between primary surgical resection and primary chemoradiation therapy are now comparable
 - Primary surgical resection decreases exposure to chemoradiation therapy and associated side effects

Patient Selection



- De-identified patient data was collected from the National Cancer Database (NCDB) which represents more than 70% of all newly diagnosed cancers nationally

- Inclusion Criteria
 - Diagnosis of oropharyngeal squamous cell carcinoma made between 2010 - 2015
 - Clinical T1-T2 sized cancer
 - N0 or N1 nodal disease
 - Primary resection performed with either TORS or non-robotic endoscopic surgery

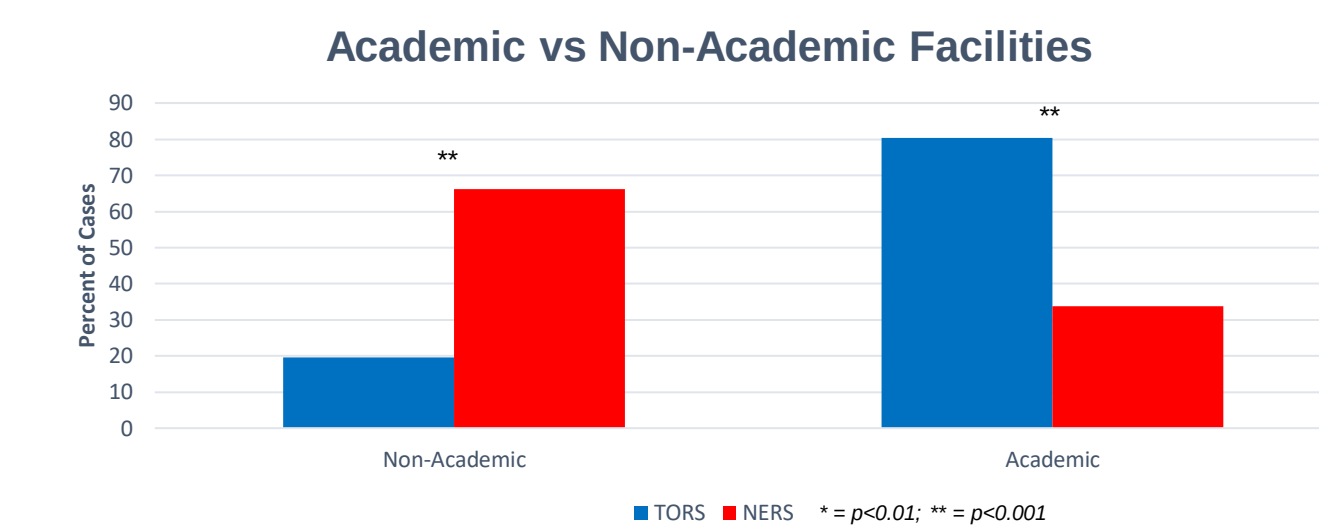
- Exclusion Criteria
 - Neoadjuvant therapy
 - Additional malignancies
 - Missing patient data

Statistical Analyses

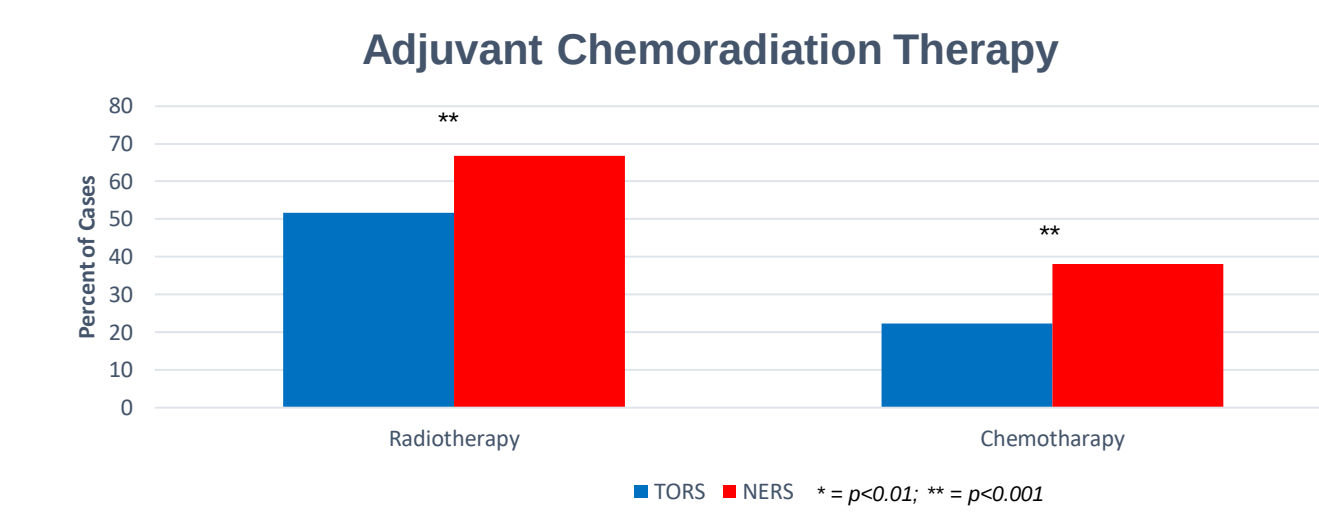
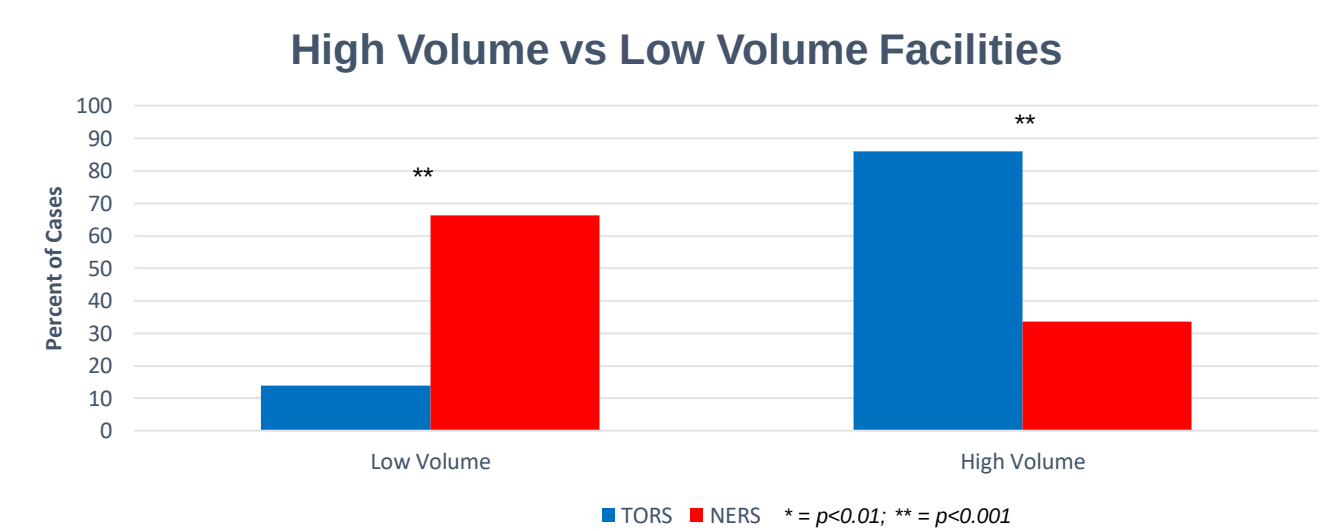
- Patient characteristics data collected for this study included age, sex, race, insurance status, primary tumor site, clinical stage and nodal status, Charlson-Devo score, treatment in an academic center, and treatment in a high-volume facility
- Patient characteristics were compared between TORS and non-robotic endoscopic surgery groups with student t-tests (continuous variables) and Pearson chi-squared tests (categorical variables)
- A binary logistic regression evaluated the association between patient demographics, health, disease, and treatment characteristics (surgical procedure and margin positivity)
 - Patient with unknown margin status were excluded (n=128)
- Univariate and Multivariate survival analysis was performed using the cox proportional regression model and Kaplan Meier Curves

Results

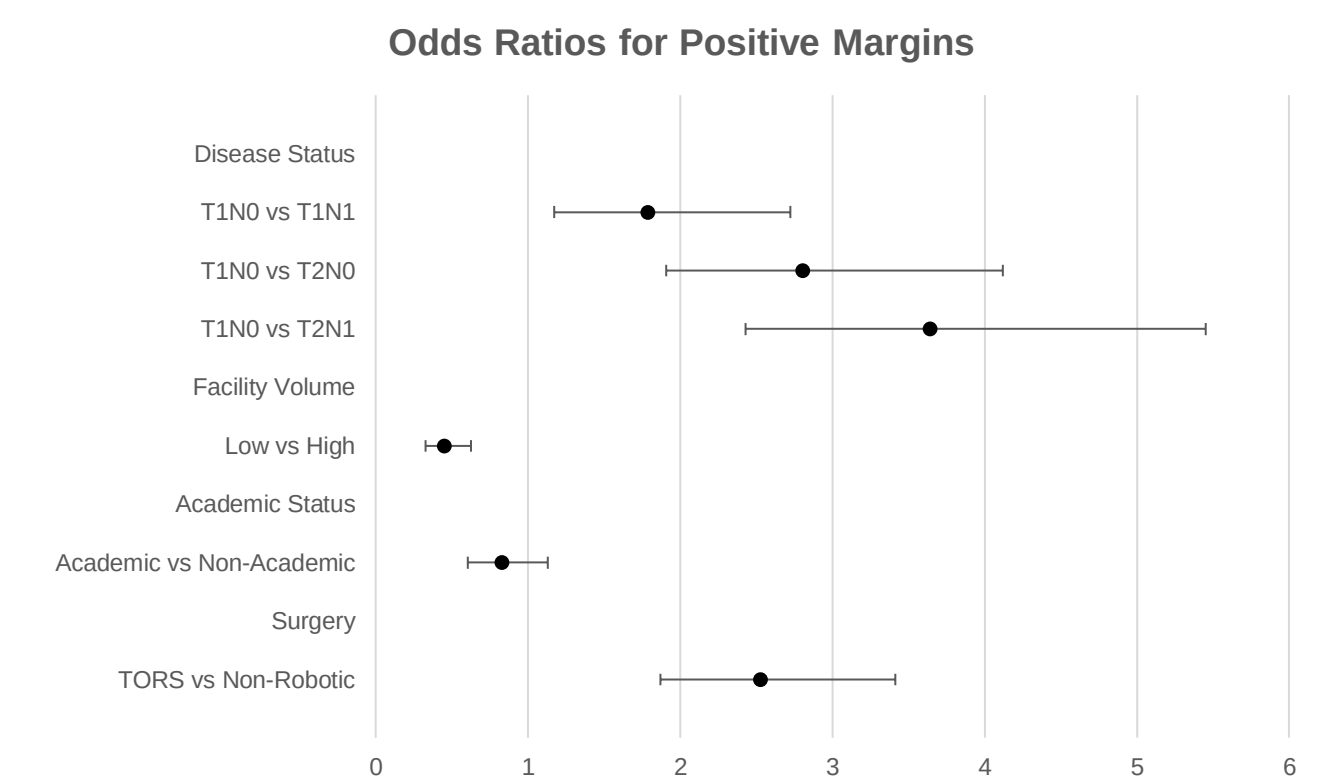
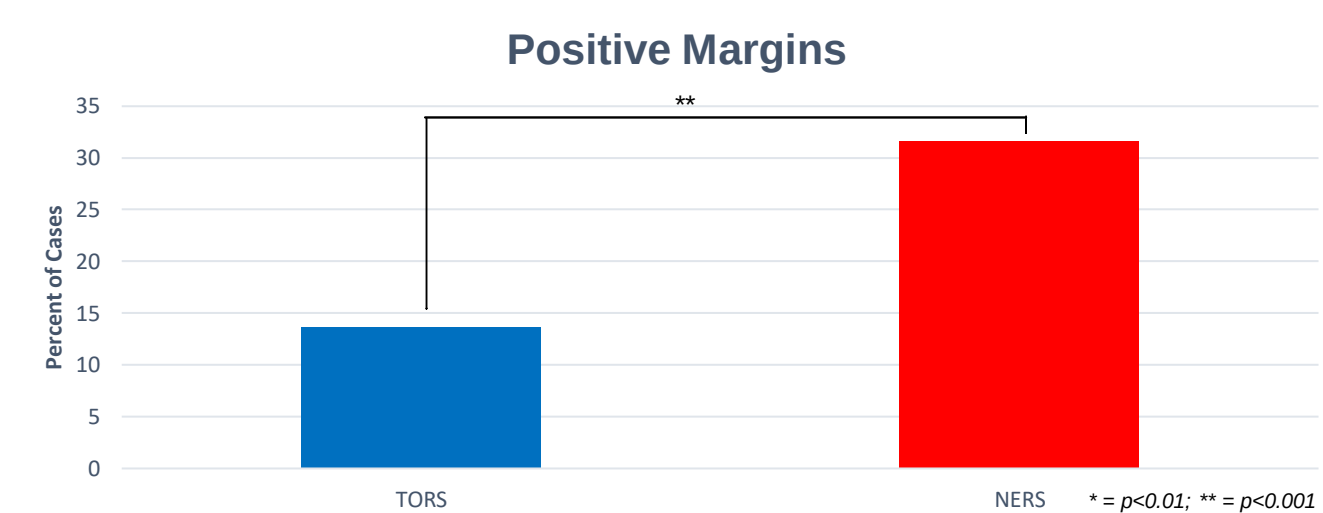
A total of 1,026 patients received TORS while 734 patients received non-robotic endoscopic surgery



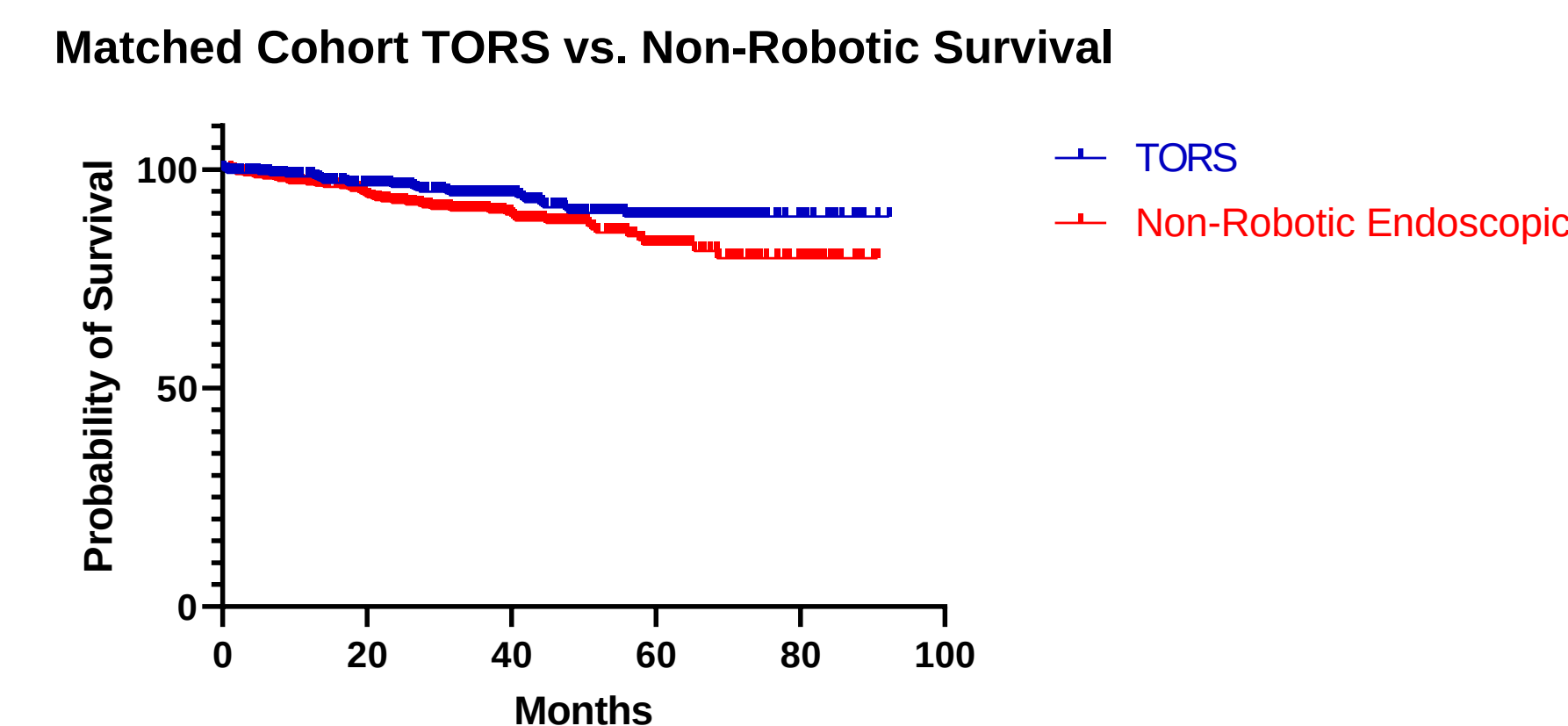
TORS was significantly more likely to occur at academic and high-volume centers



TORS was significantly associated with fewer positive margins and adjuvant chemoradiation therapy



Significantly great odds of positive margins were associated with worsening disease status, low volume facilities, and NERS



TORS was associated with greater long-term survival but not to a statistically significant degree

Conclusions

- TORS surgery was performed significantly more at academic facilities and those with high volume head and neck cancer surgeries
- Non-robotic endoscopic surgery had higher rates of margin positivity and adjuvant chemoradiation therapy following surgery
- While TORS did result in better surgical margins and less adjuvant chemoradiation therapy, these did not convey a survival benefit
 - Multivariate cox proportional regression did not show significant differences in survival between surgical groups

TORS vs. NRES

TORS	NRES
• Pros – Enhanced visualization and access to oropharynx – Improved en-bloc resection of whole tumors • Cons – Expensive – Requires subspecialty training of surgeons	• Pros – Less costly – More widely available in non-academic centers • Cons – Increased technical difficulty of surgery – Requires subspecialty training of surgeons