



AMERICAN
THYROID
ASSOCIATION

FOUNDED 1923

Editor-in Chief

Jerome M. Hershman, MD
Distinguished Professor of Medicine
UCLA School of Medicine
and VA Greater Los Angeles Healthcare System
Endocrinology IID, 11301 Wilshire Blvd.
Los Angeles, CA 90073
Email: jhershmn@ucla.edu

Associate Editors:

Albert G. Burger, MD
Professor, University of Geneva
Geneva, Switzerland
Email: agburger@bluewin.ch

Jorge H. Mestman, MD
Professor of Clinical Medicine and OB/GYN
University of Southern California,
Keck School of Medicine
Los Angeles, CA
Email: mestman@usc.edu

Elizabeth N. Pearce, MD, MSc
Associate Professor of Medicine
Boston University School of Medicine
Boston, MA
Email: Elizabeth.pearce@bmc.org

Wendy Sacks, MD
Cedars-Sinai Medical Center
Department of Medicine
Health Sciences Assistant Clinical Professor
University of California, Los Angeles
email: wendysacks@cshs.org

Stephen W. Spaulding, MD
Professor of Medicine
Department of Medicine
University at Buffalo, SUNY
Email: medspaul@buffalo.edu

Cord Sturgeon, MD
Associate Professor of Surgery
Director of Endocrine Surgery
Northwestern University
Feinberg School of Medicine
Chicago, IL
Email: csturgeon@nmh.org

President

Bryan R. Haugen, MD

Secretary/Chief Operating Officer

John C. Morris, MD

Treasurer

David H. Sarne, MD

President-Elect

Hossein Gharib, MD

Past-President

James A. Fagin, MD

Treasurer-Elect

Gregory W. Randolph, MD

Executive Director

Barbara R. Smith, CAE
American Thyroid Association
6066 Leesburg Pike, Suite 550
Falls Church, VA 22041
Telephone: 703-998-8890
Fax: 703-998-8893
Email: thyroid@thyroid.org

Designed By

Karen Durland (kdurland@gmail.com)

Clinical Thyroidology

Copyright © 2013

American Thyroid Association, Inc.

Printed in the USA. All rights reserved.

Clinical THYROIDOLOGY

VOLUME 25 • ISSUE 3

MARCH 2013

Clin Thyroidol 2013;25:50-52.

Is Robotic Thyroidectomy Too Expensive for Routine Use in the US?

Cord Sturgeon

Cabot JC, Lee CR, Brunaud L, Kleiman DA, Chung WY, Fahey TJ III, Zarnegar R. Robotic and endoscopic transaxillary thyroidectomies may be cost prohibitive when compared to standard cervical thyroidectomy. Surgery 2012;152:1016-24.

SUMMARY

Background

This study was designed to compare the costs of standard cervical (SC) thyroidectomy, transaxillary endoscopic (TAE) thyroidectomy, and transaxillary robotic (TAR) thyroidectomy in the context of the flat reimbursement schedule for surgical procedures in the United States.

Methods

This was a retrospective review of the costs unique to each of the three procedures. A cost model was created based on data from 140 patients who underwent surgery at either the Yonsei University College of Medicine in Seoul (n = 90) or Weill Cornell Medical Center in New York (n = 50). At Yonsei, 30 patients underwent SC, 30 patients TAE, and 30 patients TAR. All patients had papillary thyroid cancer (PTC). In each of these groups, there were 15 total thyroidectomies and 15 hemithyroidectomies. At Cornell, all 50 patients underwent SC, and 88% had PTC. Cost analysis was performed from the perspective of reimbursement in the United States. Sensitivity analysis was used to evaluate the effects of uncertainty in the model.

Results

Mean total costs for the SC, TAE, and TAR approaches were \$9,028, \$12,505, and \$13,670, respectively. Higher costs of consumables (e.g., robotic instruments, which cost \$2,200 each, must be replaced after 10 uses) and longer operating times are the main contributors to the higher costs in the TAE and TAR groups. One-way sensitivity analysis was used to determine the threshold operating time required for cost equivalence. The operating time for TAE would have to

continued on next page

[Back to Contents](#)

Robotic Thyroidectomy Costs More But Is Not Better Than Standard Cervical Thyroidectomy

Cabot JC, et al.

decrease from 185 to 111 minutes, and the operative time for TAR would have to fall from 166 to 68 minutes to reach cost equivalence with the SC group.

Conclusions

TAE and TAR thyroidectomy were more expensive than SC thyroidectomy, chiefly because of the higher

equipment depreciation costs and substantially longer operating times. The flat reimbursement schedule in the United States is a disincentive to implementing the TAE or TAR approaches. It is unlikely that TAE and TAR thyroidectomy will become common in the United States, but they may survive as niche operations.

ANALYSIS AND COMMENTARY ● ● ● ● ●

Until recently, there was considerable enthusiasm for robot-assisted remote-access thyroidectomy. Many centers across the United States developed programs for remote-access thyroidectomy and attempted to reproduce the Korean experience with this new technique. However, enthusiasm began to wane in October 2011 when Intuitive Surgical, the manufacturer of the da Vinci surgical robot, indicated that it would stop supporting robotic thyroid surgery. In addition, controversy exists in the literature as to which of the remote-access approaches is superior, and even whether remote-access thyroidectomy is superior to conventional thyroidectomy. Lee and colleagues from Yonsei University have published that the TAR approach is superior to the TAE approach in terms of shorter operating time, greater lymph-node retrieval, and a shorter learning curve (1). In contrast, other authors from Korea have found the TAR approach to be longer, more costly, and associated with more drainage than the TAE approach (2). Another remote-access technique, the robotic facelift thyroidectomy, has also been compared with the TAR and was found to have a shorter operating time and was associated with a greater chance of being managed in the outpatient setting (3).

Few studies, however, have compared robotic with conventional techniques for thyroidectomy. In this model developed by Cabot and colleagues, the remote-access approaches were found to be consid-

erably more costly than the conventional approach. This is not surprising, considering the costs of robotic and laparoscopic devices, consumables unique to the remote-access techniques, and increased operating time. Broome and colleagues came to the same conclusion in a similar study comparing the costs of conventional and robotic thyroidectomy; they found the latter to be approximately twice as costly (4). Considering the fact that hospitals and physicians in the United States are not reimbursed at a higher rate by third-party payers for these procedures, those increased costs of the operation could substantially burden the health care delivery environment in which they are performed. In addition to these cost concerns, other researchers in the United States have identified issues with remote-access thyroidectomy that have led them to abandon the procedure. Landry and colleagues from the MD Anderson Cancer Center found TAR to be associated with a longer operating time, a potential for brachial plexus injury, numbness in the anterior chest wall, and greater blood loss. They called for a prospective study to evaluate cost, quality of life, and patient-reported satisfaction (5). In addition, the senior author of that manuscript has recently publicly declared that they have abandoned robot-assisted transaxillary surgery (6). In her opinion, the cosmetic benefit of robotic transaxillary thyroidectomy does not offset the risks and liability of performing an operation that takes greater resources, might have some additional complications, and is not supported by the robotic equipment manufacturer.

continued on next page

Robotic Thyroidectomy Costs More But Is Not Better Than Standard Cervical Thyroidectomy

Cabot JC, et al.

In Korea, where much of the robotic thyroidectomy literature and enthusiasm originates, reimbursement is apparently twice the standard amount for endoscopic thyroidectomy and four times the standard amount for robotic thyroidectomy (7). In contrast, in the United States there are no such incentives for TAE or TAR; reimbursement is equal for thyroidectomy regardless of surgical approach. The higher cost of the procedure is therefore borne by the health care facility instead of the third-party payer. Furthermore, because of declining reimbursements and shrinking

health care budgets, there is currently much interest in the United States and abroad in comparative-effectiveness studies. Increased costs should be associated with a substantial improvement in outcome as compared with the standard approach in order for these remote-access approaches to be considered cost-effective. This study and others appropriately question whether the increased costs of remote-access surgery are warranted, and suggest that these approaches might be cost-prohibitive.

References

1. Lee J, Lee JH, Nah KY, Soh EY, Chung WY. Comparison of endoscopic and robotic thyroidectomy. *Ann Surg Oncol* 2011;18:1439-46. Epub December 24, 2010.
2. Yoo H, Chae BJ, Park HS, et al. Comparison of surgical outcomes between endoscopic and robotic thyroidectomy. *J Surg Oncol* 2012;105:705-8. Epub September 27, 2011.
3. Terris DJ, Singer MC. Qualitative and quantitative differences between 2 robotic thyroidectomy techniques. *Otolaryngol Head Neck Surg* 2012;147:20-5. Epub February 27, 2012.
4. Broome JT, Pomeroy S, Solorzano CC. Expense of robotic thyroidectomy: a cost analysis at a single institution. *Arch Surg* 2012;August 20:1-5.
5. Landry CS, Grubbs EG, Warneke CL, et al. Robot-assisted transaxillary thyroid surgery in the United States: is it comparable to open thyroid lobectomy? *Ann Surg Oncol* 2012;19:1269-74. Epub November 8, 2011.
6. Perrier ND. Why I have abandoned robot-assisted transaxillary thyroid surgery. *Surgery* 2012;152:1025-6.
7. Duh QY. Robot-assisted endoscopic thyroidectomy: has the time come to abandon neck incisions? *Ann Surg* 2011;253:1067-8.