

# Nerve Monitors May Worsen Thyroidectomy Outcomes

Laird Harrison | November 17, 2014

SAN FRANCISCO — Using intraoperative nerve monitors for thyroidectomies can increase the risk for vocal cord paralysis — the opposite of their intended effect, a new study shows.

"We were very surprised to see this," said Thomas Chung, MD, a research fellow at the University of Alabama at Birmingham.

Dr. Chung presented the findings here at the American College of Surgeons 2014 Clinical Congress. The results were also published in the *Journal of the American College of Surgeons* (2014;219;765-770).

Whether or not nerve monitors actually reduce the risk for nerve damage as intended in thyroid surgery has been controversial, Dr. Chung explained. "There are people who feel very strongly both ways."

Advocates argue that nerve monitors can reveal the location of nerves that are difficult to see, allowing surgeons to protect them during thyroidectomy. Critics say that dissecting and visualizing the nerves is more reliable, and that monitors create a false sense of security.

Previous studies have shown modest or no benefit with the nerve monitors, but they have not included a nationwide sample of hospitals.

## Monitors in Thyroid Surgery Controversial

In their study, Dr. Chung and his team used the Nationwide Inpatient Sample to retrospectively analyze 243,527 thyroidectomies performed from 2008 to 2011.

They found that the use of nerve monitors increased yearly, from 2.6% of thyroidectomies in 2008 to 6.9% in 2011. Vocal cord paralysis also increased, from 0.9% to 1.4% of thyroidectomies.

There was significantly more vocal cord paralysis in thyroidectomies using nerve monitors than in conventional procedures (1.9% vs 1.4%;  $P < .001$ ).

"We wanted to look at this deeper because this was a very unusual finding," said Dr. Chung. He and his colleagues wondered if the nerve monitors were used in sicker patients, creating a bias in the data. They found, however, that nerve monitors were associated with a greater risk for vocal cord paralysis in all types of thyroidectomies. The one exception was total thyroidectomy with neck dissection, where the monitors were associated with a lower risk for the complication.

To eliminate institutions that used nerve monitors without reporting them, the researchers controlled for type of insurance and looked at just institutions that had billed for nerve monitoring at least once. The correlation between monitor use and vocal cord paralysis held up.

The team also determined that differential laryngoscopy rates could not explain the pattern.

One hypothesis to explain these findings is that the monitors might not work as consistently as surgeons think they do, said Dr. Chung.

"A lot of things can go wrong," he told *Medscape Medical News*, including faulty tube placement, faulty ground and probe leads, and suboptimal voltage parameters.

## Vocal Cord Damage

The rate of vocal cord paralysis was significantly lower in hospitals where surgeons used nerve monitors in more than 50% of thyroidectomies than in those where surgeons used them less often (1.1% vs 1.6%;  $P = 0.016$ ).

In addition, the lowest rates of vocal cord paralysis were seen in hospitals with the highest rates of thyroidectomy, regardless of whether or not nerve monitors were used.

A possible explanation for this could be inexperience with the technology, said Dr. Chung. "We do think there is a learning curve."

Analysis of a different database might reveal whether the less-experienced surgeons are responsible for the increased rate of vocal cord damage associated with the monitors, he said. "We caution against the broad adoption of nerve monitoring until this can be further studied," he added.

Dr. Chung said he believes that nerve monitors still have a role in cases where patients have had previous surgery or radiation treatment that changed the anatomy. "For really complex surgery, it's definitely needed," he said.

**This is an important area of study because there is a relative paucity of data for or against the use of this technology.**

After the presentation, one person in the audience argued that nerve monitoring should be effective against bilateral injury, even if it doesn't prevent unilateral injury. Dr. Chung said there were not enough cases in the database to shed light on that issue.

"This is an important area of study because there is a relative paucity of data for or against the use of this technology," said study discussant Julie Sosa, MD, from Duke University in Durham, North Carolina.

However, she cautioned, the Nationwide Inpatient Sample might not give a very complete picture of nerve monitoring and complications in thyroidectomies.

"More than 60% of thyroid surgeries are done in the ambulatory setting," she explained. And the database does not track complications after discharge or give a clear idea of what type of nerve monitoring is used — continuous or intermittent.

"In the end, I think that's the greatest challenge," said Dr. Sosa. "Sometimes we call on these databases to answer questions for which the information available cannot provide a complete answer."

*Dr. Chung and Dr. Sosa have disclosed no relevant financial relationships.*

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