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ASO Author Reflections: Hypothyroidism and Wound Healing After Salvage Laryngectomy

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Past:

The treatment of laryngeal squamous cell carcinoma has shifted toward radiotherapy (RT) or chemoradiotherapy (CRT) with the goal of organ preservation and similar survival as primary laryngectomy.¹ Recurrence after treatment requires salvage laryngectomy. Radiation predisposes patients to impaired healing and pharyngocutaneous fistulas develop in 30–75% of patients. Fistulas increase the short- and long-term morbidity, for the laryngectomy patient.²

Hypothyroidism contributes to poor wound healing, and head and neck cancer patients treated with RT have a high risk (up to 48%) of hypothyroidism.^{3,4} Radiation induces microvascular damage to the thyroid gland, and during laryngectomy the thyroid gland is often devascularized or resected.

Hypothyroidism has been associated with pharyngocutaneous fistula development.³ To date, however, no studies have explored the relationship between postoperative hypothyroidism and wound healing during salvage head and neck surgery and thus this study aimed to examine the relationship between hypothyroidism and wound healing after salvage laryngectomy.

Present:

In this study, patients who experienced hypothyroidism post-operatively had a 3.6-fold greater risk for the development of fistula (95% CI 1.8–7.1; $p = 0.0002$) in the multivariate analysis. This corresponded to a 47% fistula rate for the hypothyroid patients compared with a 23% fistula rate for the euthyroid patients. Similarly, the hypothyroid patients had an 11.4-fold greater risk for the development of a fistula that required reoperation (24 vs 5%) than the euthyroid patients (95% CI 2.6–49.9; $p = 0.001$) When TSH was analyzed as a continuous variable, the risk for fistula ($p = 0.003$) and fistula requiring reoperation ($p = 0.001$) steadily increased with increasing TSH. Hypothyroidism was associated with other wound complications including postoperative hemorrhage or hematoma and dehiscence of the neck closure. This study is the first and largest to evaluate the effects of postoperative

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hypothyroidism on surgical wound healing and suggests the importance of a euthyroid state in regards to healing after salvage laryngectomy⁵

Future:

As there are biases associated with any retrospective study, correlation of hypothyroidism and wound healing needs to be confirmed in a prospective clinical trial. The findings in this study are important as hypothyroidism is a potentially modifiable risk factor, but further research is needed to determine whether wound complications can be mitigated with postoperative thyroid replacement algorithms. As this is a retrospective study, we can only establish association but cannot establish causation. Our institution currently has a prospective clinical trial evaluating thyroid hormone replacement after salvage laryngectomy evaluating wound complications. This will hopefully establish the casual relationship and verify this study's findings in a prospective manner. The findings of the current study also have potential applications to other surgical venues in which wound healing is a vexing issue. Lastly, a mechanistic model is important to further understand the effects of thyroid function on wound healing.

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