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Minimal Invasive Thyroidectomy Versus Conventional Thyroidectomy

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Abstract
Conventional thyroidectomy (CT) is the ideal method of treating differentiated thyroid cancer. However, the modern usage of robotic thyroidectomy (RT) is frequently contentious. Even though RT integrates the exclusive advantages of the operational remote and robot remote monitoring thyroidectomy, its pertinence to cancer patients is hampered by doubtful oncological safety and advantages. The objective of this review is to compare and contrast the perioperative and oncological results of Robotic Thyroidectomy and Conventional Thyroidectomy. All available studies are retrospective or non-randomized comparisons. Liu and Ng (2016) argue that RT is inferior to CT in terms of longer operating time, higher expense, and probably inferior oncological management with fewer central lymph nodes removed. RT and CT are comparable in terms of short-term recurrence rate, quality of life outcomes, and morbidity (Kwak et al., 2015). While CT remains acceptable for most thyroid tumors, competent surgeons should continue RT on a subset of patients with low-risk thyroid malignancies and high aesthetic aspirations. Future research should employ prospective randomized experiments to facilitate objective comparisons. Also required are long-term follow-up studies to assess recurrence and survival.

Key words: *Conventional Thyroidectomy, Minimal invasive Thyroidectomy,Thyroid Cancer*

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I. Introduction

The robotic thyroidectomy is an endoscopic neck procedure that allows physicians to separate the surgical field using time-tested traction and counter traction concepts. This operation can be performed using a binocular stereo endoscope and three other tools (Holsinger & Chung, 2014). According to Kandil et al. (2020), a surgical physician can examine the operative structure in three dimensions, retract, and employ two extra instruments for dissection and hemostasis using these four "arms.". On the other hand, in conventional open thyroidectomy, patients have thyroid surgery through an incision in the neck (You et al., 2019). Since the performance of the first endoscopic endocrine neck surgery in 1996, numerous approaches to remote thyroidectomy without a typical cervical incision have been devised (Liu & Ng, 2016). As Tae et al. (2019) argue, remote access thyroidectomy by the endoscopic method is unavoidably accompanied by the restrictions of constrained working space, even though the goal of cosmetic superiority is attainable, a dual-dimensional operating concept, and limited instrument administration.

These factors have substantially reduced the utility of endoscopic thyroidectomy for treating thyroid neoplasia, as reported by Liu and Ng (2016). The robotic thyroidectomy offers physicians more surgical dexterity through multiarticulate instrumentation, a steady operating view through hand-tremor filtration technology, and superior sight through dimensional intensification (Liu & Ng, 2016). These have significantly expanded the technique's indications to include differentiated thyroid tumors. While conventional open thyroidectomy can reliably yield excellent outcomes in thyroid malignancies, many surgeons who once advocated robotic thyroidectomy have stopped doing so as a result of its use of off-label, steep learning curve, increased costs, and uncertain patient advantages.

II. Literature Review

Pan et al. (2017) conducted a meta-analysis and a systematic review comparing conventional and robotic thyroidectomy for thyroid cancer based on oncologic and surgical outcomes. The research included searching multiple records up to July 2016, including Web of Science, ClinicalTrials.gov, MEDLINE, PubMed, EMBASE, and Cochrane Library. Surgical outcomes, patient characteristics, complications, adverse events, surgical completeness, and recurrence rate were factors of interest. The meta-analysis and systematic review were based on the 5200 selected cases from 23 publications. Review findings indicate that CT is as safe as RT for thyroid cancer treatment (Pan et al., 2017). Based on surgical completeness and the long-term follow-up, the adverse events and difficulties, as well as the recurrence rate, were equal between RT and OT. RT was related to much less blood loss, fewer lymph nodes extracted, less swallowing difficulty, and higher levels of cosmetic fulfillment. In distinction, CT was associated with a shorter action period and a lower postoperative serum Tg level (Pan et al., 2017). Generally, randomized clinical tests and a larger group of patients with long-term follow-up are still required to establish the usefulness of the robotic technique.

Wang et al. (2015) aimed to evaluate the short-term results of robotic thyroidectomy with traditional open thyroidectomy for distinct thyroid carcinoma by a meta-analysis. Included were twelve non-randomized comparative studies with a total of 2513, out of which 1590 patients were in the conventional thyroidectomy cohort and 923 in the robotic thyroidectomy cohort (Wang et al., 2015). The outcomes of a meta-analysis demonstrated that robotic thyroidectomy is correlated with a considerably longer operational time and fewer central lymph nodes obtained than conventional thyroidectomy. Regarding postoperative results, Wang et al. (2015) observed no significant distinctions between conventional and robotic thyroidectomy. Therefore, robotic thyroidectomy appears possible and safe for patients with distinct thyroid carcinoma. However, additional high-quality randomized clinical tests are required to corroborate these results.

Sun et al. (2014) conducted a study that examined quality-of-life, postoperative technical, and cost outcomes for thyroid nodules and cancer patients who underwent robotic or conventional thyroidectomy. Sun et al. (2014) investigated relevant randomized controlled trials, cohort studies, and comparative effectiveness studies to identify publications that met the criteria. Using random-effects models, the authors computed the pooled relative hazard for critical postoperative difficulties, standardized mean differences in length of stay (LOS), and mean differences for the operative duration. The summary of quality-of-life results was provided in narrative format. The meta-analysis included eleven trials involving 726 individuals who underwent axilla-breast thyroidectomy or robotic transaxillary and 1205 patients who underwent conventional thyroidectomy (Sun et al., 2014). There were no cost-associated studies that qualified. The mean operation time for robotic thyroidectomy was 76.7 minutes longer than for open thyroidectomy. However, there was no substantial difference in LOS.

Persistent laryngeal nerve damage, hematoma, seroma, hypocalcemia, and chyle leakage rates did not differ significantly (Sun et al., 2014). Swallowing, voice, discomfort, and paresthesia outcomes did not differ significantly between the two methods. Although validated questionnaires were not employed and follow-up periods never exceeded three months, the robotic cluster reported a significant cosmetic satisfaction score. According to the study, transaxillary robotic and conventional thyroidectomy have comparable complication rates. However, according to Shan and Liu (2019), robotic techniques may increase the risk of new difficulties and require extended operative periods. The study suggests that robotic thyroidectomy improves cosmetic results. However, extensive follow-up periods and authenticated tools are required to study this effect more thoroughly.

III. Conclusion

Transaxillary robotic thyroidectomy techniques have similar rates of complications as the conventional approach. Nevertheless, these robotic techniques pose distinct challenges that cannot be overlooked. Robotic thyroidectomy improves cosmetic outcomes; nevertheless, long-term research utilizing authenticated tools will be required to verify the usefulness of the robotic technique (Tae, 2021). Well-designed and valid studies comparing the robotic costs versus conventional thyroidectomy continue to be a crucial void in the scientific literature. Current data suggest that RT is inferior to CT in terms of longer operating time, higher expense, and probably inferior oncological management due to fewer central lymph nodes recovered. RT and CT are equal regarding the quality of life and morbidity for thyroid cancer patients. While standard CT remains acceptable for most thyroid cancer patients, competent surgeons should continue RT on a subset of patients with low-risk thyroid tumors and high hopes for cosmetic results. Future, long-term follow-up research is required to accredit the oncological safety of radiotherapy.

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