# Retroauricular Thyroid Surgery: A Systematic Review & Meta-Analysis

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## Abstract

**OBJECTIVE:** To collate and summarize published data regarding retroauricular thyroid surgery, including average operative time and complications.
**METHODS:** A systematic review and meta-analysis of the literature was conducted examining published articles indexed on the PubMed and Scopus databases. English language articles were included if they reported operative times and complications for retroauricular thyroid surgery. A meta-analysis of proportions was then performed for nominal variables and weighted averages and standard deviations were calculated for continuous variables.
**RESULTS:** Twelve articles were included in the meta-analysis. Average unilateral thyroid surgery operative times for robotic and endoscopic approaches were 126.3±41.6 and 120.5±34.3 minutes, respectively (p>0.05). The overall operative time was 123.65±38.72 minutes. Rate of temporary recurrent laryngeal nerve (RLN) palsy was 6.54% (95% confidence interval: 3.55-10.35). Permanent palsy only occurred in the setting of gross tumor invasion requiring resection, Average tumor size was 1.29±0.99cm. Average postoperative drainage output was 137.93±67.29 mL. Average length of stay was 4.09±1.13 days.
**CONCLUSIONS:** Published data suggests that retroauricular thyroid surgery with appropriate patient selection is a safe alternative to open surgery. Development of newer techniques may cause this technique to fall out of favor.

## Methods and Materials

A systematic review of the literature was conducted on December 13, 2018 using the PubMed-NCDB and Scopus databases. Systematic reviews are exempt from institutional review board approval at our institutions. The search was performed by two individuals (Z.F. & E.Z.) and included the following terms and Boolean operators: (retroauricular OR postauricular OR facelift OR face lift) AND thyroid*.

Studies were included if they reported outcomes for unilateral thyroid surgery using the retroauricular technique and were published in the English language. The primary outcomes of interest were operative time and rate of injury to the RLN. Secondary outcomes included tumor size, blood loss, serosanguinous drainage output, and length of stay. We excluded studies that performed surgery with a technique other than the retroauricular approach (e.g. including a submental incision in the operation), studies from which sufficient data could not be retrieved from the publication or authors after contacting them, and studies that had overlapping data from multiple publications. For studies with overlapping data, the most recent/largest study was preferentially selected for inclusion in this review.

Articles were critically appraised to assess level of evidence and bias using the Oxford Center for Evidence-Based Medicine (OCEBM) criteria. If discrepancies in the reviewing process arose, the articles in questions were reviewed with the senior author (G.M.W.) to make a final decision.

## Results

294 references were identified from our search after duplicates were removed. After screening titles, abstracts, full text articles, and references, 12 articles were ultimately included in the meta-analysis.[1-12] (**Figure 1)**

Endoscopic and robotic retroauricular approaches were analyzed and compared. When combining both approaches, the overall operative time was 123.65±38.72 minutes (n=476). The average robotic and endoscopic operative times were 126.3±41.6 (n=271) and 120.5±34.3 (n=215) minutes, respectively. There was not a statistically significant difference in operative time between the two techniques (p>0.05). **Table 1** lists data from individual studies.

Temporary RLN palsy occurred at a rate of 6.54% (95% CI: 3.55-10.35) There were no reports of permanent palsy. 7 studies reported serosanguinous drainage output for 319 patients. The average output was 142.67±62.88 mL. Average length of stay was 4.09±1.13 days (n=353 patients; 7 studies). Studies conducted in Korea had a significantly longer length of stay (5.28±1.4 days vs 1.1±0.44), p<0.0001. The average tumor size reported by 8 studies was 1.29±0.99cm

| First author (year) | Origin | Study design | N | Operative time (min) |
|---|---|---|---|---|
| **Robot Assisted** | | | | |
| Lira (2018) | Brazil | Retrospective | 26 | 143.7±42.5 |
| Dabas (2018) | India | Prospective | 10 | 100.7±21.7 |
| Byeon (2018) | South Korea | Retrospective | 105 | 87.1±55.9 |
| Lee (2017) | South Korea | Retrospective | 10 | 127.5±8.7 |
| Duke (2017) | USA | Prospective | 90 | 161.9±31.1 |
| Sung (2016) | South Korea | Retrospective | 20 | 143.6±43.8 |
| **Endoscope Assisted** | | | | |
| Lira (2017) | Brazil | Prospective | 10 | 119±25.6 |
| Lee (2017) | South Korea | Retrospective | 10 | 127.5±8.7 |
| Lee (2016) | South Korea | Retrospective | 113 | 104±34.3 |
| Byeon (2016) | South Korea | Retrospective | 16 | 115.7±22.2 |
| Ban (2016) | South Korea | Retrospective | 8 | 143±29.7 |
| Park (2015) | South Korea | Retrospective | 11 | 140.9±17 |
| Chung (2015) | South Korea | Prospective | 47 | 152±48 |

**Table 1.** Operative times by study

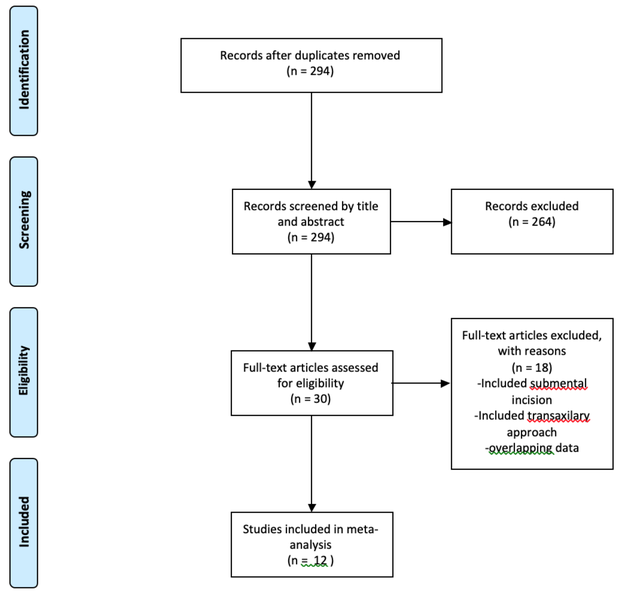


**Figure 1.** PRSIMA diagram

## Discussion

The results of this systematic review demonstrate that RAT is a feasible and safe alternative to the standard anterior cervical thyroidectomy. No statistically significant differences were seen when comparing operative times of the endoscopic and robotic techniques. The studies in this review did not compare operative times to the transcervical. The rate of RLN palsy in this review was low and all cases were temporary. Permanent RLN palsy has been reported using the retroauricular technique in the setting of gross tumor invasion.

## Conclusions

The retroauricular thyroidectomy is a safe and feasible alternative to the traditional transcervical thyroidectomy. As newer techniques emerge, this approach may fall out of favor. Nonetheless, the approach is familiar to the head & neck surgeon, provides acceptable safety profiles and operative times, and gives the surgeon access to the lateral neck, which may be of benefit as remote-access techniques become more prevalent.

## Contact

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