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Completion thyroidectomy-indications and complications

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We have read the manuscript by Sawant and Nixon et al. in the European Journal of Surgical Oncology with considerable interest [1]. The subject of completion thyroidectomy has generated considerable debate and controversy over many decades. This has also become a subject of discussion in various international guidelines regarding the impact of completion thyroidectomy on the overall prognosis, outcome, complications, and true indications. What remains somewhat unclear is the decision-making of completion thyroidectomy on the biology of thyroid cancer, prognostic factors, and risk group analysis.

The authors studied their experience of completion thyroidectomy to assess the impact of completion thyroidectomy in terms of duration of admission and associated complications [1]. They reviewed prospective multidisciplinary team records of Southeast Scotland from 2009 to 2015. This is a retrospective study of 361 patients of whom 161 (45%) underwent completion thyroidectomy. Clearly, this manuscript has the drawbacks as any other retrospective, multi-institutional study of data entry and missing information in various fields of analysis. However, we must give credit to the authors for their honesty in reporting their complication rates. They reported 14% of patients having suffered complications, 3% with postoperative hematoma, 2% with permanent nerve palsy, and 8% with hypoparathyroidism. They also reported complication rate to be 18% in low-risk (T1-T2) thyroid tumors. This complication rate may be somewhat under reported as routine post-operative vocal cord evaluations were not done. This reminds us of the old surgical aphorism – when you hear a surgeon talking about the number of cases divide by 2, and when the surgeon talks about complications, multiply by 2.

Clearly, the focus of this manuscript is to discuss the complications of completion thyroidectomy. However, we would like to take this opportunity to discuss the entire philosophy of completion thyroidectomy, the biology of low risk thyroid cancer, and the indications for completion thyroidectomy considering new American Thyroid Association (ATA) guidelines. Even though there are several publications in the literature suggesting completion thyroidectomy can be performed safely, we must realize that there are definite complications related to scarring and fibrosis, probably slightly higher risk of nerve injury and higher risk of parathyroid issues. The status of the ipsilateral parathyroid remains unclear to the operating surgeon performing contralateral surgery. The authors reported 45% of patients underwent completion thyroidectomy [1]. Clearly, this number is much higher than we would have expected. In our institution, the overall need of completion thyroidectomy is generally less than 5%-10% after lobectomy. However, the authors do admit that their decisions were largely based on British Thyroid Association Guidelines of generous approach towards total thyroidectomy and radioactive iodine [2]. The decision about extent of thyroidectomy would be best made in the operating room during the first surgical procedure, based on prognostic factors and risk group analysis.

The definitive diagnosis, whether it is a follicular neoplasm or papillary carcinoma, rarely changes the philosophy of extent of thyroidectomy. The preoperative ultrasound is very critical to make sure there are no concerning abnormalities on the opposite lobe, and there are no nodules more than 5mm that may haunt the operating surgeon in the future. The purpose of completion thyroidectomy is primarily to facilitate giving radioactive iodine, and this can be determined at the outset when a patient presents for initial consultation based on the extent of the disease, risk group analysis, and prognostic factors.

The authors noted microscopic papillary carcinoma in 22% of the contralateral lobe [1]. This probably is most appreciated by each patient and family as to removal of microscopic thyroid cancer. However, we all recognize that presence of microscopic thyroid cancer is well known in 6%–10% of the general population, and it has no major clinical implication. The need of radioactive iodine in the low-risk group has been challenged recently, and most of the guidelines are now against the routine use of radioactive iodine in low risk thyroid cancer, since it does not have major impact on the long-term outcome [3].

The prognostic factors in thyroid cancer are extremely well-defined from earlier publication by Byar et al. from EORTC, and subsequently from Mayo Clinic, Lahey Clinic, and Memorial Sloan Kettering Cancer Center [4–7]. Each one of the institutions developed their own prognostic factors and eponyms for the same. The Mayo Clinic popularized age, grade of the tumor, extrathyroidal extension, and size of the tumor (AGES)[5]. They developed a prognostic score and related overall outcome based on the prognostic score. Cady from Lahey Clinic popularized age, distant metastasis, extrathyroidal extension, and size (AMES), and his data is quite convincing that overall prognosis depends mainly on the risk group

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stratification into low- or high-risk group rather than extent of surgery [6]. The Memorial Sloan Kettering Cancer Center published GAMES (grade, age, distant metastasis, extrathyroidal extension and size of the tumor) [7]. The Mayo Clinic re-visited their large database and published metastasis, age, completeness of resection, invasion, and size of the tumor (MACIS) as important prognostic factors [8]. Initial complete oncologic resection is very important in thyroid cancer. The goal of the initial surgery should be to consider oncologically sound and full-proof surgical procedure. It is the responsibility of the operating surgeon to determine the presence of gross extrathyroidal extension and modify the surgical procedure if a patient is likely to need radioactive iodine either soon after surgery or sometime in the future. The patients who are likely to develop distant metastasis such as hard, fixed tumor, or gross extrathyroidal extension or aggressive histology would be most benefited by total thyroidectomy at the outset. Obviously, the patient and the referring endocrinologist may get very concerned when the final pathology report comes back as papillary carcinoma or minimally invasive follicular carcinoma. Interestingly, the authors have reported 45% of their patients having undergone completion thyroidectomy for follicular carcinoma of the thyroid [1]. However, what is lacking is the risk group analysis of these follicular carcinomas. The follicular cancers are divided into two groups: low-risk groups and high-risk groups based on the capsular and vascular invasion. The minimally invasive follicular carcinoma is considered to be non-threatening malignancy as reported by Jon Van Heerden from Mayo Clinic [9].

The knee-jerk reflex around the world has been completion thyroidectomy when the lobectomy reports diagnosis of malignant tumor. However, it should be our responsibility to discuss with the pathologists the implications of the final pathology report and whether there is a gross extrathyroidal extension, any residual tumor, or major vascular invasion and aggressive of histology. Various studies in the literature, including our own study from Memorial Sloan Kettering Cancer Center, reported similar long-term outcomes with lobectomy versus total thyroidectomy in the low-risk group [7]. The risk group stratification is very important to avoid over treatment in well differentiated thyroid cancer to avoid treatment-related medical and surgical complications. The complications related to nerve injury and permanent hypoparathyroidism may be worse than the disease itself, and they are directly proportional to the extent of thyroidectomy and inversely proportional to the experience of the surgeon.

Pre-operative evaluation is very important in terms of clinical or radiological gross extrathyroidal extension, status of the central compartment and lateral nodes, and the high-risk features of thyroid cancer in the pre-operative ultrasound. If necessary, a computerized tomographic scan with contrast is also very important for better evaluation of the extent of the disease, which will help the surgeon make appropriate decisions for the first surgical procedure, rather than routinely considering completion thyroidectomy. If there is substantial nodularity on the other side more than 5mm, one may consider a fine needle aspiration biopsy of the nodule on the other side or monitor the opposite lobe. If the nodule on the other side increases in size later, the patient may require appropriate further evaluation and appropriate intervention if there are suspicious findings. If there are substantial sized nodules on the other side, we generally would consider total thyroidectomy as the initial surgical procedure. The current major indications for completion thyroidectomy are:

1. Gross extrathyroidal extension on the ipsilateral side.
2. Gross residual disease on the esophagus, recurrent laryngeal nerve, or the tracheal wall.
3. Major vascular or capsular invasion.
4. Poorly differentiated carcinoma or aggressive Hürthle cell carcinoma.

Obviously, the reason behind these major indications is to facilitate patients receiving radioactive iodine, which may be of some benefit in long-term follow-up. However, in patients with poorly differentiated thyroid carcinoma or aggressive Hürthle cell carcinoma, the role of radioactive iodine remains unclear. The decisions about completion thyroidectomy are quite complex, and depend upon each surgeon's experience, judgment, institutional philosophies, and the concern raised by endocrinologist who is likely to follow the patient. Fortunately, in our institution endocrinologists and surgeons share similar philosophies, which clearly helps to make appropriate decisions regarding extent of thyroidectomy [7]. Even though the debate about completion thyroidectomy has been a hot topic over the last 50 years, the recent guidelines published by ATA seem to lean more towards hemi-thyroidectomy and avoid completion thyroidectomy in most of the patients with low-risk group [3,10]. This clearly has been reflected in the 8th edition of staging system, showing increasing incidence of hemithyroidectomy in the United States and downstaging of thyroid cancer [11]. We would like to take the opportunity to congratulate the authors of this interesting manuscript for their honesty in reporting the complications of completion thyroidectomy and their excellent discussion regarding the current role of completion thyroidectomy in view of biology of low-risk thyroid cancer. We are hopeful that the British Thyroid Association will follow the ATA guidelines and the philosophy of “less is more” in low risk well differentiated thyroid cancer patients.

Conflict of interest statement

None declared.

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