Review Article

Thyroidectomy in elderly patients aged ≥70 years

Davide Inversini[1], Andrea Morlacchi[1], Giuseppinella Melita[2], Simona Del Ferraro[1], Carlo Boeri[1], Mattia Portinari[3,4], Antonino Cancellieri[2], Francesco Frattini[1], Antonio Giacomo Rizzo[2], Gianlorenzo Dionigi[2]

[1]ASST Sette Laghi Ospedale di Circolo e Fondazione Macchi, Varese 21100, Italy; [2]Division for Endocrine and Minimally Invasive Surgery, Department of Human Pathology in Adulthood and Childhood G. Barresi, University Hospital Policlinico G. Martino, University of Messina, Messina 98125, Italy; [3]Department of Surgery, S. Anna University Hospital, Ferrara, Italy; [4]Department of Morphology, Surgery, and Experimental Medicine, University of Ferrara, Ferrara, Italy

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Correspondence to: Francesco Frattini, MD. ASST Sette Laghi Ospedale di Circolo e Fondazione Macchi, via Guicciardini 9, Varese 21100, Italy. Email: francescofrattini79@gmail.com.

Abstract: Worldwide, the indications for thyroid surgery have been continuously extended among elderly patients in the last 20 years. The balance between treatment indication and surgical risk is certainly an interesting topic for every thyroid surgeon. This paper is a review of recent literature from January 2005 up to April 2017. We analyzed three principal subjects: indications for surgical treatment, medical complications and surgical complications. We can summarize the conclusions of our analysis, stating that age could not be considered as an absolute factor, but in relation to the comorbidities and the general clinical condition of the patient. Special risk indices dedicated to geriatric patients could be very useful in order to facilitate the decision-making process; however, relying on the current knowledge, we could state that there is value in providing surgery to geriatric patients in highly specialized and high-volume centers, where access to technology and its systematic use, coupled with surgeons' experience, could certainly avail the geriatric patient management.

Keywords: Elderly; thyroidectomy; geriatric; complication; thyroid surgery

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Introduction

Thyroid diseases are very common among elderly patients (1). The improvement of diagnostic techniques, an easier access to hospital facilities and the increase in average life expectancy have made thyroidectomies more feasible for the geriatric population (2). Therefore, worldwide, the indications for thyroid surgery have been continuously extended. The incidence of differentiated thyroid cancer in the elderly is increasing (3). Also, the prevalence of thyroid nodules during US performance is higher in old patients (4).

While the incidence of thyroid disease is increasing especially in elderly population, we must consider the risk of complex surgery in this type of patients. Geriatric patients are more often affected by a large burden of metabolic and cardiovascular comorbidities. Nonetheless the use of novel surgical and anesthesiological techniques could reduce the operative time and the incidence of some complications (1).

The aim of this study is to review the modern surgical literature in relation to the complications, the risks and the benefits of thyroid surgery in geriatric patients.

Methods

We evaluated the recent literature (from January 2005 up to April 2017) on PubMed Central. Our research was based on the following terms: thyroid, complication, elderly, aged, thyroidectomy, geriatric. All abstracts were read separately

by four different residents. The scientific relevance of the papers was assessed considering the number of patients, the accuracy of the statistical method and the originality of the article. Each paper selected was read by at least two surgeons; the ones reported in the references have been considered scientifically relevant by the authors.

ResultS

We analyzed the issue focusing on three main topics.

Indications for surgical treatment

If we consider the oncologic issue, the differentiated thyroid cancer has a worse prognosis in the old patients (5). These data seem to be quite concordant in the literature. It could be due to a higher incidence of more aggressive histotypes but also to a significant diagnostic delay (6). An article published by Grogan *et al.* demonstrated a higher risk of recurrence of PTC in older patients (7).

In elderly patients the clinical and pathological features, as far as T status, LN metastasis, extranodal and extracapsular extension seem to be more aggressive. This could be due to the high frequency of late diagnosis. The 5-year disease-free survival is significantly lower than in younger patients (81.3% *vs.* 94.7%) (8).

According to Longeu *et al.*, surgeon's experience is more important than patients' age in terms of outcomes (9). Even though this study stressed the importance of surgical treatment in the elderly for oncological and histopathological reasons, the number of elderly patients in this paper was too low to make a definitive statement.

Assuming that thyroid cancer in the elderly is more invasive, increased mortality could depend also on less appropriate treatments for geriatric patients. Some surgeons tend to perform a less definitive surgery on these patients; a recent paper published by Shevchyk *et al.* showed that older patients with PTC are less likely to receive total thyroidectomy than younger patients (10).

Although the thyroid malignant disease has a lower incidence in the elderly, we must remember that it represents the 30% of all thyroid disorders compared to 6–8% in younger subjects (11). Tracheal compression and thyrotoxicosis are frequent surgical indications in the elderly (12).

Medical complications

In terms of medical complications, data on elderly patients are conflicting (13).

An interesting prospective cohort study, published by Grogan *et al.*, described an increased incidence of medical complications after thyroid surgery in old patients, analyzing 7,915 procedures (14). This study divided the population in three groups according to age: young (age 16–64 years), elderly (age 65–79 years) and super elderly (80 years and above). A different rate of complications occurred among the subjects: 1% of the young patients, 2.2% of the elderly and 5% of the super elderly. In particular there was a significant increase in systemic infections and in pulmonary and cardiac complications. However, the differences in wound infections between the three groups were not statistically significant.

Considering the association between aging and many medical comorbidities, the impact of old age on length of hospital stay, rehospitalization and costs is easily predictable (15). Other studies confirmed that readmission is slightly more frequent among the elderly, but this difference was not statistically significant (16). Indeed, some other papers suggested that the higher incidence of complications is due to a greater amount of comorbidities than age itself (17).

Surgical complications

As far as surgical complications are concerned, we considered hematoma, seroma, recurrent laryngeal nerve palsy and hypocalcemia. An interesting study conducted by Tartaglia *et al.*, examined these complications in a large number of patients (4). In this paper, subjects were divided in two groups according to age (65-year-age cut-off). The difference between the two groups was not statistically significant; however, all the surgical complications occurred more frequently in elderly patients. According to Caulley *et al.*, age could be considered as a risk factor for postoperative complications of total thyroidectomy; a BMI greater than 30 kg/m^2 is a risk factor only in the aged over 70 (18).

In regards to hypocalcemia, Seybt *et al.* published an interesting study, involving 428 patients; elderly patients had a transient hypocalcemia rate comparable to that of the younger ones (12.5% *vs.* 11.1%, respectively) (16). Other articles did not find any statistical difference concerning hypocalcemia (4,19,20). The literature seems to be quite concordant not defining age as a risk factor for hypocalcemia. However, it should be noted that the treatment of hypocalcemia in the elderly is more difficult and risky, not mainly because of age itself, but because more

frequently diuretics are used to treat hypertension and cardiac failure.

Laryngeal nerve palsy (LNP), due to the lesion of recurrent laryngeal nerve (RLN), is an important complication in thyroid surgery. Only few papers considered age as a risk factor for RLN injury. Most of them did not find any statistical difference between elderly and young patients. Bergenfelz *et al.* found instead a correlation between older age and permanent vocal cord palsy in a study conducted in 5,252 patients (21,22).

In terms of hematoma, we have to consider that older patients are more frequently on treatment with anticoagulants and antiplatelet agents. The increased incidence of postoperative hematoma in the elderly is confirmed by a study conducted by Dehal *et al.* (23). If we analyze the modern literature, it is rather clear that the use of energy-based devices can reduce the incidence of intraoperative bleeding and hematoma (24,25). Therefore, because of the higher incidence of this complication, hemostatic devices might have a greater impact on the geriatric surgical patients.

In addition, a higher incidence of diabetes could explain the occurrence of surgical site infection (9). On the other hand, a recent article published by Elfenbein *et al.* showed that in 49,326 patients that underwent thyroidectomy, age does not influence the onset of surgical site infections (26).

Certainly, the current literature analysis allows us to confirm that modern surgical devices could be helpful to minimize the risk of complications in old patients undergoing thyroid surgery. Tolone *et al.* compared surgical outcomes in old and young patients using energy-based devices; the authors found no difference in the two groups. Moreover, new technologies could be able to reduce the operation time, providing advantages especially to the elderly population (1).

ConclusionS

Modern surgery must definitely consider the individual risk factors of each patient. Attempting to summarize the vast literature on this issue, we can consider age as a risk factor not in absolute terms but in relation to the comorbidities and the general clinical condition of the patient. Recent studies showed that the increase of complications in the elderly patients is more related to the biological than the chronological age and with the amount of associated comorbidities. The issue is not whether to operate an elderly patient, but whether to operate a patient with relevant comorbidities taking age into account as a further comorbidity. Considering the increase in average life expectancy, surgeons can't avoid surgery just because of the patient age. It could be very useful to select special risk indices dedicated to geriatric patients in order to facilitate the decision-making process; however, relying on the current knowledge, we could state that there is value in providing surgery to geriatric patients in highly specialized and high-volume centers. The surgeon's experience, associated to the availability of current technology such as laryngeal and vagal nerve neuromonitoring and energy-devices are nowadays the main factors that can reduce complications and improve the patient's surgical outcomes.

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None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

References

1. Tolone S, Bondanese M, Ruggiero R, et al. Outcomes of sutureless total thyroidectomy in elderly. Int J Surg 2016;33 Suppl 1:S16-9.
2. Schwartz N, Shpitzer T, Feinmesser R, et al. Thyroid surgery in the elderly. Gerontology 2013;59:401-7.
3. Calò PG, Medas F, Loi G, et al. Differentiated thyroid cancer in the elderly: our experience. Int J Surg 2014;12 Suppl 2:S140-3.
4. Tartaglia F, Russo G, Sgueglia M, et al. Total thyroidectomy in geriatric patients: a retrospective study. Int J Surg 2014;12 Suppl 2:S33-6.
5. Cho JS, Yoon JH, Park MH, et al. Age and prognosis of papillary thyroid carcinoma: retrospective stratification into three groups. J Korean Surg Soc 2012;83:259-66.
6. Cannizzaro MA, Buffone A, Lo Bianco S, et al. The thyroid disease in the elderly: Our experience. Int J Surg 2016;33 Suppl 1:S85-7.
7. Grogan RH, Kaplan SP, Cao H, et al. A study of recurrence and death from papillary thyroid cancer with 27 years of median follow-up. Surgery 2013;154:1436-46; discussion 1446-7.
8. Chereau N, Trésallet C, Noullet S, et al. Prognosis of papillary thyroid carcinoma in elderly patients after thyroid

resection: A retrospective cohort analysis. Medicine (Baltimore) 2016;95:e5450.
9. Longheu A, Medas F, Pisano G, et al. Differentiated thyroid cancer in patients >/=75 years: Histopathological features and results of surgical treatment. Int J Surg 2016;33 Suppl 1:S159-63.
10. Shevchyk IV, Cobian BA, Martinez SR. Age-based disparities in the use of total thyroidectomy for papillary thyroid carcinoma. Clin Transl Oncol 2017. [Epub ahead of print].
11. Biliotti GC, Martini F, Vezzosi V, et al. Specific features of differentiated thyroid carcinoma in patients over 70 years of age. J Surg Oncol 2006;93:194-8.
12. Polistena A, Monacelli M, Lucchini R, et al. Surgical management of mediastinal goiter in the elderly. Int J Surg 2014;12 Suppl 2:S148-52.
13. Yu GP, Li JC, Branovan D, et al. Thyroid cancer incidence and survival in the national cancer institute surveillance, epidemiology, and end results race/ethnicity groups. Thyroid 2010;20:465-73.
14. Grogan RH, Mitmaker EJ, Hwang J, et al. A population-based prospective cohort study of complications after thyroidectomy in the elderly. J Clin Endocrinol Metab 2012;97:1645-53.
15. Tuggle CT, Park LS, Roman S, et al. Rehospitalization among elderly patients with thyroid cancer after thyroidectomy are prevalent and costly. Ann Surg Oncol 2010;17:2816-23.
16. Seybt MW, Khichi S, Terris DJ. Geriatric thyroidectomy: safety of thyroid surgery in an aging population. Arch Otolaryngol Head Neck Surg 2009;135:1041-4.
17. Gervasi R, Orlando G, Lerose MA, et al. Thyroid surgery in geriatric patients: a literature review. BMC Surg 2012;12 Suppl 1:S16.
18. Caulley L, Johnson-Obaseki S, Luo L, et al. Risk factors for postoperative complications in total thyroidectomy: A retrospective, risk-adjusted analysis from the National Surgical Quality Improvement Program. Medicine (Baltimore) 2017;96:e5752.
19. Harris AS, Prades E, Tkachuk O, et al. Better consenting for thyroidectomy: who has an increased risk of postoperative hypocalcaemia? Eur Arch Otorhinolaryngol 2016;273:4437-43.
20. Kalyoncu D, Gönüllü D, Gedik ML, et al. Analysis of the factors that have an effect on hypocalcemia following thyroidectomy. Ulus Cerrahi Derg 2013;29:171-6.
21. Ravikumar K, Sadacharan D, Muthukumar S, et al. EBSLN and Factors Influencing its Identification and its Safety in Patients Undergoing Total Thyroidectomy: A Study of 456 Cases. World J Surg 2016;40:545-50.
22. Bergenfelz A, Sadacharan D, Muthukumar S, et al. Risk of recurrent laryngeal nerve palsy in patients undergoing thyroidectomy with and without intraoperative nerve monitoring. Br J Surg 2016;103:1828-38.
23. Dehal A, Abbas A, Hussain F, et al. Risk factors for neck hematoma after thyroid or parathyroid surgery: ten-year analysis of the nationwide inpatient sample database. Perm J 2015;19:22-8.
24. Dionigi G, Boni L, Rausei S, et al. The safety of energy-based devices in open thyroidectomy: a prospective, randomised study comparing the LigaSure (LF1212) and the Harmonic(R) FOCUS. Langenbecks Arch Surg 2012;397:817-23.
25. Coiro S, Frattaroli FM, De Lucia F, et al. A comparison of the outcome using Ligasure small jaw and clamp-and-tie technique in thyroidectomy: a randomized single center study. Langenbecks Arch Surg 2015;400:247-52.
26. Elfenbein DM, Schneider DF, Chen H, et al. Surgical site infection after thyroidectomy: a rare but significant complication. J Surg Res 2014;190:170-6.

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