

COVID-19 era and thyroid surgery

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ABSTRACT

We aim to update the pandemic literature concerning thyroidectomies for benign and malign conditions. The inclusion criteria: PubMed published papers, the key words of research are "thyroidectomy" or "thyroid surgery" or "endocrine surgery" and "coronavirus", "pandemic" or "COVID-19". The reduction of thyroid ultrasound and fine needle aspiration is reflected in a lower volume of indications for surgery depending on the phases of pandemic and the rate of infections in general population. Imperative surgical approach is needed in cases with poor prognostic like poorly differentiated, undifferentiated, anaplastic and medullary carcinoma, while cases with well differentiated carcinoma originating from follicular cells associate a less aggressive behavior, thus the overall prognostic might not be affected if surgery is postponed. During the period of times with severe restrictions and high infection rates in general population, the delay of surgical procedures was unavoidable, thus scores of assigning the moment of operation were introduced as PAPS (Physician Assigned Priority Scoring) and MeNTS (Medically Necessary Time Sensitive). The need of assessing post-thyroidectomy complications is essential in situations when telemedicine is not a solution as severe cases of hypocalcemia, vocal folds damage, local liquid collections, etc. In conclusion, scores validation is still needed. Critical pre-operative decision takes into consideration the pandemic circumstances (COVID-19 status of the patient and of the health workers involved in the procedure). Use of digital health care systems might reduce the pre- and post-operative burden. Overall, a reduction of thyroid surgery volume was registered during the first year of pandemic all over the world, while the procedure itself seems safe for the patient from a point of view related to the risk of coronavirus cross-infection.

Keywords: thyroidectomy, thyroid, nodule, COVID-19 pandemic, coronavirus, endocrine surgery, thyroid surgery

INTRODUCTION

Thyroid hosts the coronavirus, thus the potential implications on thyroid conditions and associated thyroid surgery (1,2). The reduction of thyroid ultrasound and fine needle aspiration is reflected in a lower volume of indications for surgery depending on the phases of pandemic and the rate of infections in general

population (3-6). Imperative surgical approach is needed in cases with poor prognostic like poorly differentiated, undifferentiated, anaplastic and medullary carcinoma while cases with well differentiated carcinoma originating from follicular cells associate a less aggressive behavior thus the overall prognostic might not be affected in cases with delayed surgery (7,8,9) (Figure 1).

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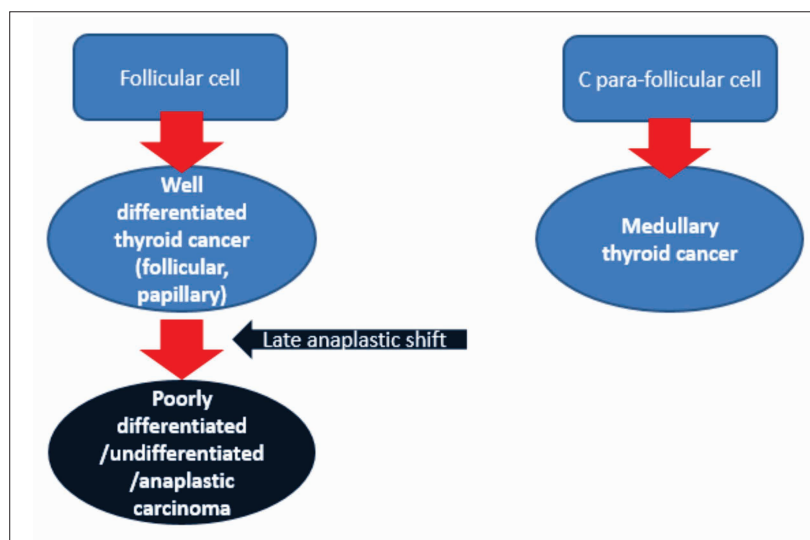


FIGURE 1. Types of thyroid cancers originating for follicular and para-follicular cells (1-9)

METHOD

We aim to update the pandemic literature concerning thyroidectomies for benign and malign conditions. This is a review type of paper. The inclusion criteria: PubMed published papers, the key words of research are “thyroidectomy” or “thyroid surgery” or “endocrine surgery” and “coronavirus”, “pandemic” or “COVID-19”. We cited articles of various types like original studies, case reports and reviews, respective experts’ opinions. The selection is based on clinical relevance for practitioners related to the field of thyroid surgery according to the subsections we created below.

ASSIGNING / PLANNING A SURGICAL INTERVENTION AMID PANDEMIC

During the period of times with severe restrictions and high infection rates in general population, the delay of surgical procedures was unavoidable, thus scores of assigning the moment of operation were introduced as PAPS (Physician Assigned Priority Scoring) and MeNTS (Medically Necessary Time Sensitive) (10-23). One study on 146 patients (68% women, median age of 60) showed a statistically significant delay between low and high PAPS (79 days versus 35 days, $p = 0.01$) while by using MeNTS, the subjects with benign thyroid conditions had a statistically significant higher score than people with suspected or confirmed thyroid malignancy without correlations to delay of surgery, thus PAPS seems a better predictor than MeNTS concerning the timing of intervention (24). A retrospective study included patients between 2017 and 2020 showed that patients referred to thyroidectomy during pandemic are more likely to be confirmed after surgery with a

more aggressive thyroid neoplasia (25). THYCOVIT is a study dedicated to thyroid surgery, realized in Italy during the first year of pandemic; this is a multi-centric (28 centers), national, case-controlled study comparing the volume of interventions in 2020 versus 2019; 3,892 procedures were taken into consideration; (38% in 2020), the reduction of procedures number depends of pandemic months, varying between 5% and 65% (26).

VOLUME OF SURGICAL PROCEDURES AMID PANDEMIC

One study evaluated the changes on endocrine surgery practice that were required as an adjustment to pandemic; this is a retrospective study enrolling patients from April to October 2020 and similar period of time from 2019; a number of 130 surgeries was reduced to 89 procedures during pandemic; the initial pre-operative assessments were similar between pre-pandemic and pandemic surgeries; 68% of operation capacity was conserved amid pandemic months; the post-operative complications were similar, while no patient became COVID-19 positive during hospitalization (27). The thyroid surgery experience of a tertiary center during 2020 showed the impact of pandemic in terms of 20% volume reduction when compare to 2019 (28). A prospective study coming from China showed that during 2020 there was a massive reduction of thyroid surgery versus 2019 (up to no surgery during first phase of pandemic) and the procedures that were performed had a statistically significant shorter hospitalization stay; no case was re-admitted for post-operative complications, and no case of COVID-19 infection during admission was detected (29).

POTENTIAL SURGERY-RELATED COMPLICATIONS

The need of assessing post-thyroidectomy complications is essential in situations when telemedicine is not a solution as severe cases of hypocalcemia, vocal folds damage, liquid collections, etc (30,31,32). One study on pediatric thyroidectomies focused on iatrogenic recurrent laryngeal nerve and vocal folds anomalies by using ultrasonography during surgical procedure since standard flexible naso-endoscopy exposes to an increased risk of contracting the coronavirus (as a post-operative additional evaluation) (33). This is a prospective study for 2 years showed on 15 thyroidectomies that the accuracy of intra-operative ultrasound is 92% which is a more useful alternative amid pandemic circumstances (33). Post-thyroidectomy hypothyroidism does not seem a particular COVID-19 infection risk (34,35). A positive coronavirus infection might associate a higher risk of hypocalcemia in severe cases or hepatic damage in peri-operative circumstances considering the potential anesthetics exposure (36,37). As seen in others medical and surgical domains, the pandemic stress should be taken into consideration in patients referred to thyroidectomy and followed after that or patients waiting for a thyroid surgery (38,39).

A meta-analysis from 2021 on thyroid surgery included 293 papers; 9 studies were selected for statistics and revealed on 2217 procedures that 60.8% of patients had a diagnostic of thyroid cancer; the protocol varied with hospital; the average hospital stay was 48-72 hours; cross-infection ratio was of 1.9% and 0.4% of them associated a severe COVID-19-related lung involvement which is considered a good safety profile based on infectious rational amid pandemics (40).

A multi-centric, international (26 countries), observational study on 1,137 surgical interventions for head and neck cancer (including thyroid cancer – 21% of them) identified a percent of 1.2% as 30-day mortality, as well as a ratio of 3% as being those who were found COVID-19 positive during first month after surgery; the

severe infection was correlated with advanced tumor at presentation; 3% of health care professionals were also found positive at coronavirus test within the first 30 days after operation (41). Overall, thyroid surgery might seem a safe procedure for both patient and surgical team (41). However, other procedures like emergent tracheostomy (with local anesthesia) in cases where oro-tracheal intubation is not feasible, it represents a particularly infectious high-risk procedure for practitioners (42). Intubation issues are found in patients with respiratory conditions, sleep apnea as seen in acromegaly, obesity or heavy smokers, which also might complicate a potential coronavirus infection (43,44,45).

DISCUSSIONS

Whether the implementation of mandatory vaccination before thyroidectomy will become the “new normal” is still a matter of debate (46,47). Until then, the rule of self - isolation at home for 2 weeks before surgery seems rational to avoid a positive infectious status at the moment of surgery, and to avoid unnecessary exposure of health care practitioners (46,47,48). Also, case-finding and case-treating strategies via digital medicine are still a new and open chapter of medicine (48-51).

CONCLUSIONS

Validation of scores is needed. Critical pre-operative decision takes into consideration the pandemic circumstances (COVID-19 status of the patient and of the health workers involved in the procedure). Use of digital health care systems might reduce the pre- and post-operative burden. Overall, a reduction of thyroid surgery volume was registered during the first year of pandemic while the procedure itself seems safe for the patient from a point of view related to the risk of coronavirus cross-infection.

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