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Editorial

Remote-access Thyroid Surgery: Controversies[☆]

Cirugía tiroidea con acceso remoto: controversias



Open thyroidectomy (OT) using the cervical approach is a common surgical procedure that, in experienced hands, is associated with low morbidity. Currently, Kocher's transverse cervical incision continues to be the standard access for surgical exposure of the thyroid gland because of the excellent demonstrated results and the indisputable reproducibility this technique offers.¹ In the last 25 years, we have witnessed the development, boom and consolidation of minimally invasive surgery as a result of the intense technological development that surgery has undergone (endoscopic platforms, vision improvements, appearance of robotics, etc.).² Thyroid surgery has also benefited from these advances by becoming perfected. More recently, a new range of options for treating thyroid disease has also been made available.

In this context, it is important to highlight a new concept for accessing the thyroid space from a distance, which several publications refer to as "remote-access" surgery. With this new way of understanding cervical surgery, the thyroid space is accessed endoscopically, remotely and not from the anterior region of the neck, such as the Marseille groups with Prof. Henry at the head or Dr. Vidal's team in Barcelona had previously published.³⁻⁶ In addition to the advantages of endoscopic surgery, remote-access thyroidectomy (RAT) has the added attraction of aesthetic preservation of the neck. This factor is attractive to both patients and endocrine surgeons as it is an approach with no visible scars.⁷ Reports show that these techniques have short-term surgical results similar to those of open surgery, including quality of life (voice dysfunction,odynophagia, dysphagia, sensation of a foreign body or presence of asphyxiation or cough with swallowing), which are characteristics that should be mandatory and represent a quality criterion that has been established as a standard.⁷⁻¹⁰ However, the different approaches described for RAT worldwide are contemplated with caution because they are technically challenging and could involve new risks. Furthermore, their oncological equivalence and efficiency are controversial.¹

Most of the studies evaluating these approaches come from Asian countries, particularly South Korea. However, the acceptance and implementation of these approaches has been slow in Europe and the United States.¹ Several reasons have been suggested that could explain this. These include differences in patient characteristics, patterns of clinical practice and patient interest, as well as the controversy surrounding these approaches in the community of endocrine surgeons. One example is the study by Ban et al. of 3,000 patients treated with robotic transaxillary thyroidectomy (RTT), which reported patient characteristics that are far different from those of our population: mean age 39, average BMI 22 kg m² and small thyroid nodules (mean 0.66 cm).¹¹ This study described additional complications that are rarely or never seen with OT, such as chyle leak (0.4%), brachiocephalic venous injury (0.03%), traction injury (0.1%), perforation of the axillary flap (0.1%), etc.¹¹ Another endoscopic experience is that of Lee et al., who used the bilateral axillo-breast approach and reported the results from 1,026 operated patients, showing patient characteristics that were similar to the series described above.¹² Finally, the experience with the transoral approach reported by Dr. Anuwong's group in Thailand also emphasized the baseline characteristics of the patients and the description of complications never before seen in this surgery, such as the appearance of injuries to the mental nerve or serious facial lesions.¹³ It is essential to highlight that these complications also take place in a surgical context of highly experienced hands and in early-stage disease (small nodules, <3 cm, confined to a single thyroid lobe and in patients with BMI < 30 kg/m²), which stresses the importance that these technically complex procedures should be carried out in strictly selected cases, at high-volume medical centers, with strict protocols and by very experienced surgical teams.

As for the Western world, a national review of 68,393 thyroidectomized patients from 2010 to 2011 summarized the state of RAT in the United States: 225 patients underwent RTT

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(0.3%), less than 0.1% transoral thyroidectomy, and OT was performed in the remainder; meanwhile, surgery with remote access had been conducted in 93 hospitals, but 89 reported less than 10 cases.¹⁴ The limited implementation of these techniques in Western countries underlines the differences between a more challenging nature of the disease (nodules > 3 cm and involvement of both thyroid lobes) and the patient characteristics in that region of the world (BMI > 30 kg/m²) compared with Asian countries. Reinforcing this statement, the Kandil et al. group in the United States underlines the differences in the demographic characteristics of patients who are treated surgically.¹⁵ These authors show that 70% of the procedures were hemithyroidectomies, with a frequency of complications of 24%; furthermore, there were unusual complications with the use of these procedures, associated with a longer operative time compared to OT.¹⁵

The Pisa group series about RTT showed early surgical results similar to the Asian series, with no evidence of an increase in unusual complications. The authors concluded that this approach can be safe, effective and represent an alternative in highly selected cases.¹⁶ Regarding the retroauricular and transoral approaches, the previously commented controversies are also valid. However, there are still a greater number of uncertainties to be resolved, as they are more recently introduced approaches.^{13,17}

As for the learning curve in RAT, a comparative study by Lee et al. has shown that the surgical time decreases gradually as surgical experience increases, then stabilizing after 35–40 cases for RTT and 55–60 cases for endoscopic thyroidectomy.^{18,19} In their study, Kandil et al. demonstrated a statistically significant decrease in operative time after performing 45 RTT, as well as a significant increase in total operative time in patients with a BMI > 30.20 kg/m².¹⁵ Although the number of complications between patients with normal weight and overweight patients were similar, their data highlight the technical challenges that can be expected in obese patients.¹⁵ In another interesting study, Cabot et al. prospectively compared the results of robotic total or subtotal thyroidectomy between an experienced surgeon and 3 non-experts: initially, there was a longer operative time and higher frequency of complications in patients treated by the inexperienced surgeons.²⁰ However, once the inexperienced surgeons had performed 50 total or 40 subtotal thyroidectomy procedures, the results were similar to those of the expert surgeon.²⁰

In terms of oncological safety, there are no randomized or comparative clinical trials with long-term follow-up data that assess the oncological equivalence between RAT and OT. The most recent meta-analysis published on surgical safety and oncological efficacy prepared by Son et al. has reported that the robotic approach is associated with less blood loss, greater patient satisfaction with the aesthetic results and less swallowing impairment compared to the conventional open approach. Furthermore, it was associated with shorter operative time and greater number of lymph nodes recovered in patients with thyroid cancer.²¹ But, in view of the few studies published in cancer patients with long-term follow-up, we believe that it is not justified to fully recommend its use in malignant disease.

The efficiency of these approaches has been analyzed in a study by Cabot et al., which compared the costs of OT, transaxillary endoscopic thyroidectomy and RTT.²⁰ The total cost of surgery was higher for the transaxillary approaches when compared with the conventional approach (\$13,087 vs. \$9,028); however, they reported equivalent procedure costs once the total operative time drops below a certain threshold.²⁰ Despite the data from this study, it has been demonstrated that robotic remote access surgery under current conditions is not cost-effective, since the procedure is longer and more expensive compared with OT and transaxillary endoscopy. We will have to wait for the development of new robot-assisted surgical devices and the opening of markets to new platforms in order for the costs of current robotic arms to drop. Meanwhile, various surgical groups, such as the Hospital Clinic of Barcelona, are leading the development and implementation of non-robotic transaxillary endoscopy with promising results, reduced costs and a reproducible surgical technique⁶ to be offered to patients who value avoiding an incision in the neck due to work requirements, aesthetic reasons or a history of poor wound healing, as well as patients who need to rapidly return to their daily life activities with preserved neck mobility

In closing, RAT represents a range of valuable approaches for a select group of patients (thyroid nodules < 3 cm in diameter, confined to a single thyroid lobe, with BMI < 30 kg/m², who want the aesthetics of the neck to be preserved). We therefore consider that these techniques should be part of the surgical armamentarium of surgeons who are especially dedicated to the field of endocrine surgery, have extensive experience in endoscopic approaches and work within the framework of high-volume units at referral hospitals. Taking into account the controversies that exist for their generalized implementation (such as patient selection, challenging technique, results and costs versus conventional surgery), we feel it is essential for interested surgeons to know about the different RAT options to treat the thyroid gland. We believe that their use requires rigorous patient selection with strict application of the established criteria (aware of the absolute contraindications). Likewise, it is extremely important to plan the implementation of these new techniques in a progressive, structured and supervised manner by experts in endoscopic and endocrine surgery.

Conflict of Interests

The authors have no conflict of interests to declare.

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