

Trans Oral Endoscopic Thyroidectomy Vestibular Approach (TOETVA), Report of the First Case Series from Ecuador

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ABSTRACT

Conventional thyroid surgery has been employed for over 100 years, and it is considered as the standard technique, in the last years several minimally invasive access techniques have been described, Anuwong describes his series of the first 60 human cases of Trans-Oral endoscopic thyroidectomy vestibular approach (TOETVA) in 2015, in Latin America and Ecuador our group published the first case in 2016, this is the report of our cases made by this technique to date.

Keywords: Transoral endoscopic thyroidectomy; Minimally invasive video-assisted thyroidectomy; Bethesda Clasification; TOETVA; Recurrent laryngeal nerve

INTRODUCTION

Conventional thyroid surgery has been used for several years, was modify by Kocher in XIX century, since that it is considered as the standard technique [1]. The endoscopic technique for neck surgery was described in 1996 for a partial parathyroidectomy [2] and thyroid surgery in 1997 [3], remote minimally invasive procedures by transaxillary or retroauricular approach can now be identified to name a few of them [4,5], Miccoli [6] described the: minimally invasive video assisted thyroidectomy (MIVAT) in 1998 that addresses a single 2 cm incision in the neck without the use of endoscopic instruments or gas. In 2008 Witzel [7] described for the first time the sublingual transoral approach in cadaveric models and in porcine models. Wilhelm in 2009 also describes the anatomy of the floor of the oral cavity and the cervical spaces for transoral procedures and in 2010 makes the first clinical case report calling it endoscopic minimally invasive thyroidectomy eMIT [8,9]. In 2012 Nakajo [10], describes a new endoscopic technique for transoral thyroid surgery: video-assisted neck surgery (TOVANS) where mechanical retraction is used for gas-less exposure. The first series of 60 cases was reported in 2015: transoral endoscopic thyroidectomy vestibular approach (TOETVA) by Anuwong [11]. In Ecuador and latinamerica, we performed the first surgery using TOETVA in 2016 [12]. Since then, this technique has been chosen taking into account the patient selection criteria described by Anuwong [13]. TOETVA

offers an excellent aesthetic result by not leaving visible scars, as well as favorable oncological results, and for some authors it is no longer considered an experimental procedure. There are several comparative studies whose results are favorable in contrast to other techniques [14]. Progress has been made towards transoral modified radical dissection [15]. Even Dr. Anuwong himself, has taken this technique one step forward by performing a thyroidectomy with right modified radical dissection (levels II, III, IV, Va) in June 2020.

In this study we present the first case series in our country of TOETVA and its medium-term results.

METHODS

As part of the search for all patients who have undergone vestibular thyroidectomy (TOETVA) since 2016, when it was first performed, patients who were candidates for TOETVA met the following criteria in the single integrated medical record system of the Ecuadorian Institute of Social Security AS-400: (a) have signed in written consent; (b) a thyroid diameter estimated by ultrasound ≤ 10 cm; (c) gland volume estimated at ≤ 45 ml; (d) nodule size ≤ 50 mm; (e) presence of a benign tumor such as a thyroid cyst or a single or multiple nodular goiter; (f) Bethesda III or IV category; and (g) papillary microcarcinoma not evidencing metastasis.

All patients with giant goiter, advanced thyroid cancer, presence of adenopathies and patients previously submitted to conventional

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Surgery was excluded. The following variables were taken into consideration: age, sex, histopathological diagnosis, type of surgery (total vs. partial and level VI central compartment dissection), and signs suggestive of hypocalcemia, presence of dysphonia, low ionic calcium at 24 hours post-surgery, surgical time and additional complications. Moreover the surgical technique was the same described and used by our group in the first report of 2016 [11].

RESULTS

A total of 24 patients undergoing TOETVA were included; the mean age was 39.64 ± 10.76 years with a 95% CI (39.64;0.35) with a minimum age of 28 and a maximum of 65 years, with higher concentration in the 28-58 year old age group with 85% representativeness (N=20,4/24) (Table 2.), a total of 6 patients (25%) presented symptoms of transient hypocalcemia; 8 patients (33.3%) presented transient dysphonia (Table 1); the most prevalent preoperative histopathological diagnosis was BETHESDA IV with 11 patients (45.83%), in 62.5% (N=15/24) needed total thyroidectomy, in 37.5% (N=9/24) lobectomy and 8.3% (N=2/24) we removed the nodes from level IV. A low ionic calcium value was evident in 80.44% of patients with a standard deviation of ± 42.76 and 95% CI; in terms of surgical time the average was 156.67 minutes with a standard deviation of ± 26.34 and 95% CI (143.56, 169.78) the lowest time recorded was 120 minutes and the highest was 210 minutes (Table 3), with a progressive decrease from the first cases to the last; as additional complications we had a case of thermal tracheal injury that led to perforation, resolved by realizing tracheostomy with favorable evolution and withdrawal

Table 1. Complications in patients undergoing TOETVA, number of cases and percentage of total 24 patients.

Complications	Total 24	Percentage	Resolution
Signs of hypocalcemia/ hypocalcaemia	6	25%	Yes
Dysphony	8	33,50%	Yes
Low Ca ionic	19	80,44%	Yes
Others:			
Dyspnea	1	0,24%	Yes
Tracheal perforation	1	0,24%	Yes
Hematoma	1	0,24%	Yes
Erythema	1	0,24%	Yes

Table 2. Minimum (min), maximum (max) and average patient age range. Post-surgical histopathological diagnosis Bethesda (Beth) IV or V and indeterminate (Ind) where the behavior was defined by transoperative freezing study.

Age			Histopathology		
Min	Max	Average	Beth IV	Beth V	Ind
28 years	65 years	39,64 +/- 10,76	11 (45,83%)	9 (37,5%)	4 (16,6%)

Table 3. Type of surgery: total, partial, and central neck dissection CND. Minimum (min), maximum (max) surgical time in minutes and average.

Surgery			Time		
Total	Parcial	CND	Min	Max	Average
15 (62,5%)	9 (37,5%)	2 (8,3%)	120 minutes	210 minutes	156,67 +/- 26,34

of the same at 3 weeks, a case of dyspnea that required support with oxygen for 36 hours and with spontaneous resolution, a patient with cervical hematoma with immediate detection and drainage with good subsequent evolution, a patient who presented edema and mild erythema at the site of a drainage wound that improved at 3 days with conservative measures and the absence of antibiotic treatment; finally, no recurrent laryngeal nerve damage was evident in any of the cases and the dysphonia present in the patients resolved spontaneously at 3 +/- 1.2 days.

DISCUSSION

The use of the TOETVA technique offers advantages in selected cases, good haemostatic control as well as results comparable to the classical technique; in thyroidectomies performed under specific circumstances such as Graves' disease, cases of conversion have been reported due to hypervascularity secondary to that disease [16], however the endoscopic approach offers adequate visualization and favorable control of haemostasis. Another minimally invasive technique offers the same advantages as TOETVA and is safe in benign pathologies, although it is not totally scar-free [17]. Regarding certain transitory complications such as hypocalcemia, which is evident in a non-negligible percentage of thyroidectomies [18], TOETVA does not appear to be a risk factor for their development according to the series reported by Anuwong and in accordance with the results of our series; in comparative studies in patients with thyroid neoplasia and with suitable selection criteria for performing TOETVA, post-surgical complications as well as the oncological outcome were favorable and even comparable to the techniques of open thyroidectomy [19]. In the same way, it is a technique with good results and few complications in patients diagnosed with papillary thyroid microcarcinoma [20]. The minimally invasive approach was described for neck surgery approximately 25 years ago, as an option and alternative in those patients where a favorable aesthetic result can be obtained without altering an adequate proceeding and resolution of the pathology [21]. Complications present in thyroid surgery, such as recurrent laryngeal nerve injury, infection, bleeding, upper laryngeal nerve injury, occur similarly in these techniques [22]; however, there is an increased risk of infection due to the oral approach, which implies an adequate use of antibiotic prophylaxis and therefore no infection has occurred in our series. In a general context and according to data published for TOETVA, major complications occur in less than 5%, and infections are usually sporadic [23,24]. In short, several authors agree that TOETVA thyroidectomy in selected patients is comparable to the conventional technique in terms of complications and results [25-27]. Likewise, a comparative study was carried out in our institution where there were no statistically significant differences regarding complications and evolution comparing TOETVA and conventional surgery.

CONCLUSIONS

Endoscopic thyroid surgery (TOETVA) is safe and the results obtained do not show a significant complication rate compared to conventional surgery according to our series. During its execution, it has been possible to identify and preserve important structures such as the laryngeal nerves and the parathyroid glands, with adequate vascular control and hemostasis. We have evidence of a

low level of pain and being a NOTES technique the aesthetic result is excellent, except for a small scar of 5 mm in the case of having left drainage. On the other hand, there is no need for special instruments or equipment for its realization. The surgical time is longer in general compared to the classic technique, however there was a reduction of it and to the last cases the time between the open and TOETVA techniques is the same.

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