A SUCCESS STORY OF TRANSORAL ENDOSCOPIC THYROIDECTOMY VESTIBULAR APPROACH (TOETVA) AT DR SOETOMO GENERAL HOSPITAL, INDONESIA

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Abstract

The gold standard treatment for thyroid nodules is conventional thyroidectomy. The unavoidable side effects of this procedure include permanent cosmetic defects. Transoral endoscopic thyroidectomy vestibular approach (TOETVA) is a new technique in thyroidectomy that uses a natural orifice. With minimal surgery and excellent cosmetic results, TOETVA can be the technique of choice for patients who want a scar-free operation. Here we are reporting the success case of TOETVA that was conducted at Dr Soetomo General Hospital in Indonesia. A 57-year-old woman who presented with a benign uninodular goiter that had been presented for four years. The patient requested a surgery without leaving a scar and then she was advised to have TOETVA. The operation lasted 140 minutes and there were no complications during the procedure. There were no postoperative complications such as loss of voice. The patient did not experience severe pain and was able to return home two days after the surgery. TOETVA is a promising new method for thyroidectomy and it has the cosmetic benefits of scarless skin and less postoperative pain. However, the risk of infection is increased due to the procedure's location and the length of duration. In conclusion, TOETVA procedure is a safe procedure for selected patients and can be offered to patients who are concerned about the aesthetic outcome.

Keywords: Endoscopic Thyroidectomy, TOETVA, Thyroidectomy, Transoral thyroidectomy

Introduction

Thyroid nodules are common in clinical practices, and women are more likely to develop the nodules than men (1). The prevalence rate depends on the population being studied and the diagnostic method used. However, there has been an increasing prevalence of thyroid nodules in recent years. Studies found that the prevalence of thyroid nodules was 49% in Beijing, 17% in Brazil, 67% in North America, 27% in Finland, and 19% Belgium (2-4). The majority of thyroid nodules are benign with a 7-15% risk of malignancy (5).

Treatment of thyroid nodules depends on the results of the fine needle aspiration biopsy (FNAB). Based on FNAB examination, a thyroid nodule can be classified as is benign, suspected malignant or malignant. In benign cases that are asymptomatic, it only requires periodic monitoring for thyroid stimulating hormone (TSH) and periodic ultrasounds every year or two. However, some benign cases may require surgical intervention, particularly if the nodule are large or show signs and symptoms of obstruction (6).

The conventional surgical technique of thyroidectomy is the standard treatment for removing thyroid disease. However, this technique causes permanent cosmetic defects due to an incision in the anterior of the neck. Another technique that has been developed is the endoscopic thyroidectomy approach which consists of two endoscopic approaches, cervical and extra-cervical (7). The cervical approach is known to be a minimally invasive technique but still leaves a significant scar on the anterior of the neck. Through the extra-cervical approach, the minimal scar can be hidden, but due to the long-distance and maximum dissection considering the lack of a natural anatomical plane, this technique results in a longer operation duration and a higher complication rate. The most common extra cervical approaches are trans-axillary and trans-areolar (7).

The transoral endoscopic thyroidectomy vestibular approach (TOETVA) is a new transoral procedure that provides better cosmetic results with no scarring and minimal dissection through the natural orifice (8). Here we report a case report of the success of TOETVA carried out at Dr. Soetomo General Hospital in Indonesia.

Case Report

A 57-year-old woman with a lump in her neck for 4 years presented to Dr. Soetomo General Hospital in Surabaya, Indonesia. Physical examination revealed a lump measuring 3x3x2 cm with a firm and mobile consistency on the left anterior of the neck that moved when swallowing (Figure 1A). The patient did not complain of pain or compression symptoms. The skin color over the mass appeared normal. Ultrasound examination of the neck revealed enlargement of the left thyroid lobe with normal echoparenchymal intensity, an echogenic cystic nodule measuring 2.7x1.9x2.9 cm, the right thyroid lobe, and isthmus of normal size. The FNAB result was suggestive of a nodular colloid goiter. The patient was then scheduled for a TOETVA, which was recommended due to the patient's request for no surgical scars and considering the patient's age and general condition.

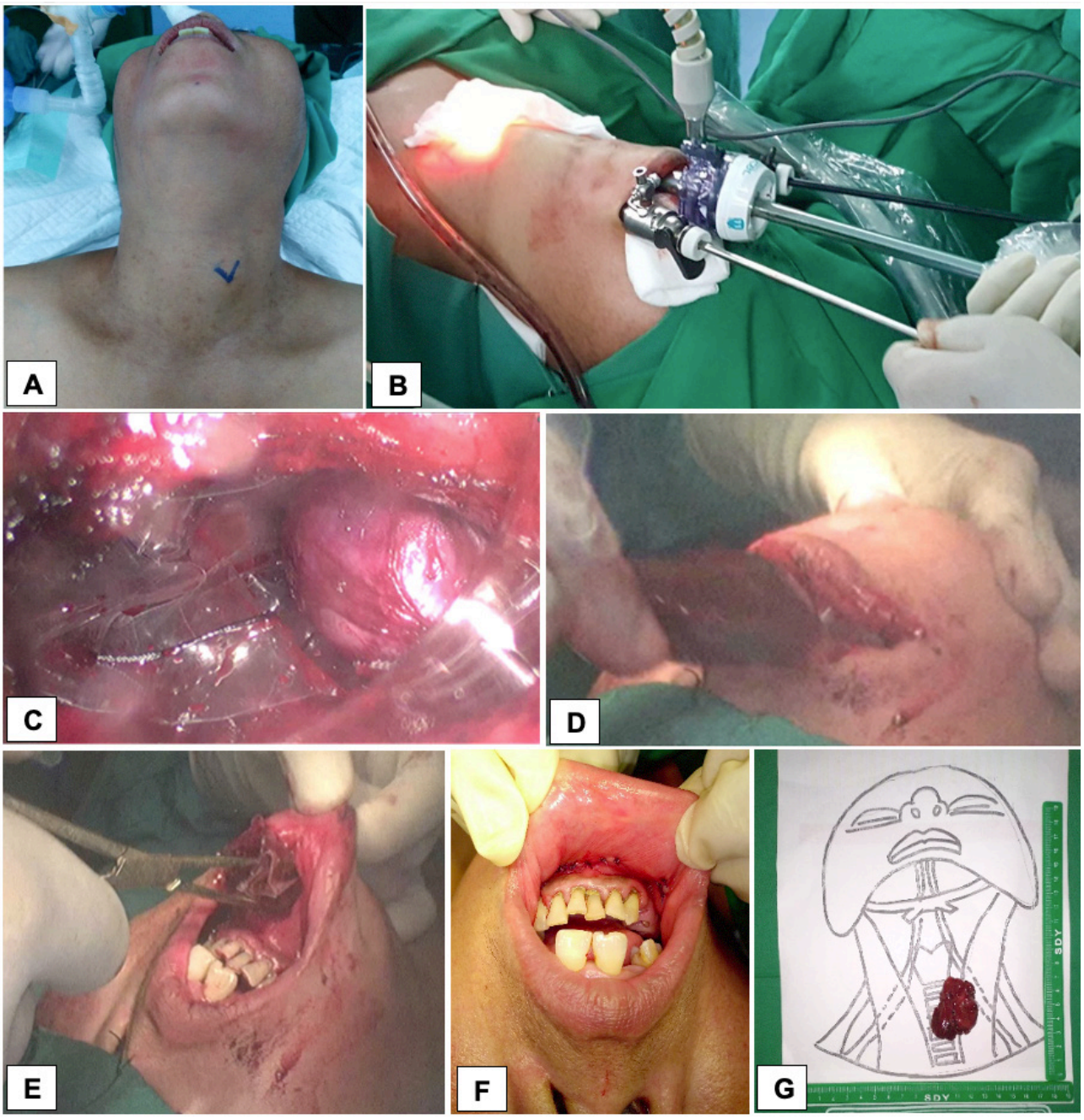

Figure 1: The procedure of transoral endoscopic thyroidectomy vestibular approach (TOETVA). (A) The patient with nodular colloid goiter, the v sign is the appearance of an external lump on the neck; (B)The position of the patient's oral cavity and equipment during the surgical process; (C) Thyroid lobe identification; (D) Removal of the thyroid lobe using an endobag; (E) Closure of the suture incision; (F) Postoperative suture appearance, the incision is closed using absorbable sutures; and (G) The nodule and its sizes

Prior to surgery, the patient was prepared by gargling chlorhexidine 3 times a day for 1 day only while prophylactic antibiotics of cefazoline 2 g intravenous (IV) injection was administrated 30 min before the procedure. The patient was positioned supine with the neck straightened using a pillow placed between the shoulders. The operator stood behind the patient's head, the endoscopic monitor was placed behind the patient's feet and the camera assistant stood near the left shoulder.

First, 1% savlon was used to wash the oral cavity then an approximately 10 mm transverse incision was made in the midline of the vestibule and extended deeply to the mandibular symphysis. A subplatysmal dissection using a Veress needle with approximately 50 cc normal saline with adrenaline was performed in 3 axes (left, center, and right). A blunt dissection in the subplatysmal plane was performed with a blunt dilator on the same three hydro dissection axes. A 10 mm central trocar for the camera was placed through the vestibular incision and insufflated to 4-5 mmHg with CO_2. Two of 5 mm trocars were placed under direct vision through 2 vertical incisions (5 mm) on the 2 most lateral aspects of the vestibule (Figure 1B).

The following steps were entered into subplatysmal plane and performed dissection. The deep fascia was opened and the strap muscles were retracted. The isthmus was identified and removed, while the laryngeal nerve was identified and separated. Excision of the left thyroid lobe was performed and removed through the oral cavity using an endobag (Figure 1C-E). The deep fascia and the portal vestibular site were closed in 2 layers using absorbable sutures (Figure 1F). There were no intraoperative complications reported during the 140-minute surgery. The results of the pathological anatomical examination showed an adenomatous goiter mass without signs of malignancy.

After surgery, the patient was transferred to the surgical ward and the antibiotic was continued to be administered until the patient was discharged. On the first day of postoperative, the patient did not complain of severe surgical pain on the and was able to speak clearly. The oral diet was allowed and the patient was discharged without complications on the second day. After discharge from the hospital, the patient was instructed to check periodically for 3 days, 2 weeks, and 4 weeks accompanied by mouth washing.

Discussion

There are 2 intermediate approaches to transoral thyroidectomy, sublingual and oral vestibular. The sublingual approach technique was first introduced by Witzel, with a single port cerviscope through the sublingual midline. Witzel et al. has successfully performed thyroidectomy on 10 live pigs (9). Nakajo et al. in 2012 has successfully published the results of trans-oral video-assisted neck surgery (TOVANS) performed on living patients (10). However, because of the high risk of secondary complications, such as damage to the mouth's floor, this procedure is becoming less popular.

The oral vestibular technique, which makes the mandibular anterior incisors without causing damage to the mouth floor or ventral tongue, was later developed. This technique is known as TOETVA. This technique has the advantage of a scar-free result, making it superior in terms of cosmetics, as well as other minimally invasive surgical benefits (11). In 2016, Anuwong was successful in publishing the first cohort of 60 patients who had undergone TOETVA surgery (8). In 2017, the study continued to assess the safety and outcome of TOETVA by comparing it with conventional thyroidectomy (12). The study showed that TOETVA resulted in a longer operation time yet less postoperative pain while the results and complications were similar to those of a conventional thyroidectomy. This procedure provides a larger field of vision, making it easier to identify the parathyroid glands and reducing the risk of permanent hypoparathyroidism after the procedure (12).

Procedures with the transoral approach are associated with a higher risk of infection when compared with the transcervical approach. In our case, pre-surgery preparation included maintaining oral hygiene and administering prophylactic antibiotics. In this patient there was no postoperative infection except a mild seroma and neck swelling. Seroma formation is a minor side effect of endoscopic thyroid surgery that can be treated with simple aspiration and has no long-term consequences. Based on the outcomes, a study from 110 patients who underwent TOETVA between 2016 and June 2020 in Korea found that TOETVA is a safe, has short operation time and had low complication rate (13). Among patients with Graves' disease found that the visual analog scale (VAS) pain score was significantly lower TOETVA group compared to open thyroidectomy (14).

Transoral endoscopy carries the risk of injuring the mental nerve that provides sensory innervation to the chin and lower lip. During transoral endoscopy, the mental nerve is vulnerable to be injured and has been linked to a high complication rate in the past. The technique modified by Anuwong reduced mental nerve injury by perfecting both 5 mm incisions to make them lateral to the canines, and very close to the lower lip (15). During postoperative observation, no complications of mental nerve injury were observed in this reported patient.

The TOETVA procedure has been modified to reduce the risk of complications. However, even for experienced surgeons, transoral thyroidectomy remains a challenging procedure. As a result, this procedure is not recommended for inexperienced surgeons. To be successful with this technique, advanced laparoscopic skills and the ability to work in tight spaces (the neck) are required. We reported a successful case of the TOETVA procedure at Dr. Soetomo General Hospital, and it is hoped that the skills in this procedure can be improved with minimal complications.

Conclusion

TOETVA is a promising new method for thyroidectomy. This procedure has the cosmetic benefits of being scarless and

having less postoperative pain. However, because of the procedure's location and length of duration, the risk of infection is higher. Nevertheless, this procedure is safe for certain patients and can be recommended to those who are concerned about the aesthetic outcome.

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Competing interests

The authors declare that there is no conflict of interest.

Informed consent

Written informed consent was obtained from the patient for inclusion in this case report. The ethical approval is not required for case report in Indonesia.

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