Early Outcomes of the Postauricular-Submental Approach Endoscopic Thyroidectomy

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Background: *The postauricular-submental approach (PSA) endoscopic thyroidectomy is a recently developed technique. The advantages of this method include that (a) it avoids paresthesia around the nipple, chest wall, and chin; (b) the midline endoscopic view can provide better orientation of surgical landmarks; and, (c) the scars are hidden in the natural neck position.*

Objective: *To report early surgical outcomes and complications of PSA endoscopic thyroidectomy*

Material and Method*: Patients undergoing PSA endoscopic thyroidectomy were included in the study. The clinical diagnosis, operative technique, pathological results, surgical outcomes, and complications were documented.*

Results: *Five patients were included, ranging between 30 and 62 years of age. The patients had a clinical diagnosis of solitary, single non-toxic thyroid nodule. PSA type I was performed in 3 patients and PSA type II in 2. The diameter of the thyroid ranged between 3 and 6 cm. The mean operation time was 180 min. None of the cases needed to convert from endoscopy to open surgery. There were no major complications.*

Conclusion: *PSA endoscopic thyroidectomy is a feasible method permitting relatively good operative visualization and minimal adverse effects.*

Keywords: *Approach; endoscopic thyroidectomy; endoscope; thyroidectomy*

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Endoscopic thyroidectomy approaches were developed to deal with cosmetic concerns resulting from conventional thyroidectomy that usually leave a transcervical incision scar. There is currently no gold standard on the best endoscopic thyroidectomy approach.

The postauricular-submental approach (PSA) endoscopic thyroidectomy has been reported[1]. The advantages of this method are that (a) it avoids paresthesia around the nipple, chest wall, and chin; (b) the midline endoscopic view provides a better orientation for surgical landmarks; and, (c) the surgical scars are hidden in the natural neck position.

The objectives of the current study were to report early surgical outcomes and complications after the postauricular-submental approach endoscopic thyroidectomy.

Material and Method

Population

The population included patients undergoing the postauricular-submental approach endoscopic thyroidectomy between January 2016 and January 2017 who had given consent for data collection.

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Patient selection

The eligibility criteria were patients with a benign thyroid mass <6 cm at its largest diameter.

Patient position and operating room setting

Each patient was placed in a supine position on the operating table with a pillow beneath the shoulders. The neck was extended to expose the operative field. The arms were placed naturally at the sides on the operating table. The patient was put under general anesthesia using nasal intubation. The surgeon stood at the head of the patient. The camera holder and the scrub nurse stood around the head and neck of the patient (Fig. 1).

Operative technique

The first mini-incision (10 mm) was made in the submental area between the chin and the hyoid bone. It is recommended that the incision be at least two finger breadths below the mental prominent to avoid damaging the submental nerve. A Veress needle was used to infiltrate the subplatysmal space with a

diluted epinephrine solution (0.1 ml of epinephrine [1: 1,000] in 200 ml of normal saline) in a fan-shaped manner.

Blunt dissection of the subplatysmal space using Kelly clamps and a vascular tunneler was started at midline until the sternal notch was reached. The tunnel was then extended laterally to the anterior border of the sternocleidomastoid muscle and the mastoid tip on both sides. The incisions for instrumental ports were then made according to the types of PSA (Fig. 2). Five-millimeter short trocars were then inserted. The 10-mm trocars with CO_2 insufflation were inserted in the submental incision then a 10-mm 30° endoscope was used to visualize the operating space. The remaining fibrous bands in the subplatysmal space were incised. The midline of the neck was identified. The monopolar dissector (a 5-mm hook) was used to make the midline incision. (Note: the bilateral strap muscle can optionally be retracted laterally by temporary suture). The isthmus of the thyroid gland was identified and divided using 5-mm ultrasonic shears (Harmonic Scalpel; Ethicon Endosurgery). The superior and lateral side of the thyroid gland were dissected. The superior thyroid artery was coagulated with ultrasonic shears. The inferolateral aspect of the thyroid gland was approached, followed by identification of the recurrent laryngeal nerve and parathyroid glands. The specimen was transferred to a plastic bag and pulled through the camera port. Meticulous hemostasis was attained and the midline repaired with endosutures. No drain was left in place. The skin was sutured cosmetically.

Fig. 1 Overview of operating room, submental and bilateral postauricular ports. Tumor displayed on monitor.

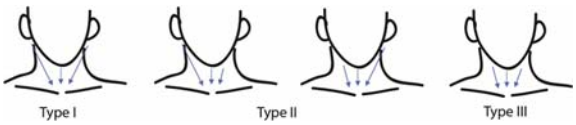

Fig. 2 Types of postauricular-submental approach (PSA). Type I: bilateral postauricular instrumental ports; Type II: postauricular and submandibular ports; Type III: bilateral submandibular ports.

Data collection

The data were collected from outpatient and inpatient records, and our pre-defined case record form. The clinical diagnosis, operative technique, pathological results, surgical outcomes, and complications were documented for analysis.

Results

Five patients were included in the current study (4 females and 1 male). Age ranged between 30 and 62. The patients had all been clinically diagnosed as having solitary, single non-toxic thyroid nodule.

PSA type I was performed in 3 patients and PSA type II in 2. The operative procedures were lobectomy and isthmectomy. The diameter of the thyroid ranged between 3 and 6 cm. The mean operation time was 180 min (range, 120 to 300) (Table 1).

The estimated blood loss was <50 ml in all cases. None of the cases needed to convert from endoscopy to open surgery. Indirect laryngoscopy was performed pre- and post-operatively in all cases. No vocal palsy was found. None of the patients experienced any numbness or facial palsy. The first patient was discharged on postoperative day 3, while the second and third patients were discharged on postoperative day 2, while the remaining patients were discharged on postoperative day 1. The cosmetic result was acceptable as the scars were hidden in the natural anatomic position (Fig. 3).

Discussion

Conventional thyroidectomy incision can sometimes result in a keloid or hypertrophic scar which is unacceptable for some patients, especially among young adolescents or females. Various approaches have been proposed for endoscopic thyroid surgery; however, controversy remains on which is the best endoscopic approach.

The mini midline cervical incision-called minimally invasive, video-assisted thyroidectomy (MIVAT)-was first used in Pisa (Italy) in 1998. The technique is characterized by a unique central access and external retraction[2]. It gained in popularity in Europe and the surgical results and safety were

Table 1. Summary of postauricular-submental approach thyroidectomy cases

Case	Sex	Age	Pathology	Size (cm)	Operative procedure	PSA type	Operative time (min)
1	Female	62	Follicular adenoma	5	Lobectomy	I	300
2	Female	30	Follicular adenoma	3	Lobectomy	I	180
3	Male	46	Thyroid cyst	6	Lobectomy	II	150
4	Female	35	Follicular adenoma	4	Isthmectomy	I	150
5	Female	42	Follicular adenoma	4	Lobectomy	II	120

Fig. 3 Cosmetic outcomes of postauricular-submental approach. PSA type I – photo taken 4 weeks after operation. A) neutral position B) Semi-extended of neck position, oblique view. PSA type II – photo taken 2 weeks after operation. C) neutral position D) Semi-extended of neck position, oblique view. 0.5 cm incision to the left of the submandibular area.

comparable with conventional thyroidectomy[3]. This technique, however, left a noticeable albeit small scar in the anterior neck.

The axillo-breast approach includes the axillo-bilateral breast approach (ABBA), the Bilateral axillo-breast approach (BABA)[4], and the postauricular and axillary approach (PAA)[5]. The complication rates to these are similar to open thyroidectomy; however, some patients may still find scarring of the breast area unacceptable. The benefits are that there is no scarring in the neck area and that the camera is introduced through the axillary port; while the disadvantage is that the dissection starts from the axilla which is unfamiliar to most head and neck surgeons.

Totally transoral video-assisted thyroidectomy (TOVAT)[6] or trans-oral video-assisted neck surgery (TOVANS) is an alternative scarless approach; however, some patients experience sensory disorder around the chin for more than 6 months after surgery. Furthermore, this method changes the clean surgical wound to a clean-contaminated wound which increases the risk of infection.

Trans-submental single-port endoscopic thyroidectomy (TSSPET) was studied in a porcine model. The major advantages are the avoidance of both extensive dissection in extracervical area and a noticeable scar in the natural neck position[7]. There have not, however, been any human studies using this approach.

The retroauricular approach (RA)[8] endoscopic thyroidectomy was recently proposed as preferable because the dissection area is smaller than that of the transaxillary approach (TA), and the surgical anatomy is familiar to head and neck surgeons. This method, however, requires that the head be rotated so that only the ipsilateral side can be dissected.

In the current study, we reported on 5 cases of PSA endoscopic thyroidectomy. There were no intra-operative conversions to open surgery. In our series, there were no completion or total thyroidectomies done. The mean operative time was 3 h. The postoperative stay depended on the experience of the surgeon. The last 2 cases were discharged 1 day after surgery. Although a thyroid lobectomy can be done as day surgery, endoscopic thyroidectomy usually requires more days to observe any complications; there was no evidence of recurrent laryngeal nerve injury in our series. The limitations of PSA endoscopic thyroidectomy are that: (a) the best results are for thyroid tumors <6 cm (i.e., it is not suitable for large tumors); (b) it is not appropriate for invasive malignant tumors; and, (c) it is contraindicated if there is a history of radiation or previous neck surgery.

The possible complications for PSA endoscopic thyroidectomy-just as with other

retroauricular approaches (RA and PAA)-is unintentional involvement of the marginal mandibular branch of the facial nerve and great auricular nerve. This problem can be avoided by dissecting the plane from the midline to the postauricular area. The postauricular incision will be made only after saline with an adrenaline injection and subplatysmal tunneling. To date, there have been no reports of facial nerve palsy or great auricular nerve injury from the postauricular approaches[5,8].

Conclusion

PSA endoscopic thyroidectomy is a feasible method that permits relatively good operative visualization and minimal adverse effects.

What is already known on this topic?

There is to date no consensus on the best approach for endoscopic thyroidectomy.

What this study adds?

The postauricular-submental approach (PSA) endoscopic thyroidectomy avoids paresthesia around the nipple, chest wall, and chin and it produces acceptable cosmetic results.

To date, there is no report on facial nerve palsy or great auricular nerve injury from the postauricular approach.

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Potential conflicts of interest

None.

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ผลการผ่าตัดต่อมไทรอยด์ผ่านกล้องด้วยเทคนิคลงแผลใต้คางและหลังหูระยะแรก

ภาธร ภิรมย์ไชย

ภูมิหลัง: การผ่าตัดต่อมไทรอยด์ผ่านกล้องด้วยเทคนิคลงแผลใต้คางและหลังหูเป็นเทคนิคการผ่าตัดแบบใหม่ที่ได้รับการพัฒนาจากการผ่าตัดแบบดั้งเดิม ข้อดีของการผ่าตัดด้วยเทคนิคนี้คือ ไม่มีอาการชาที่หัวนม ทรวงอกและคาง, แพทย์ผ่าตัดมองผ่านกล้องแล้วไม่สับสนเนื่องจากกล้องอยู่ตรงกลางร่างกาย และแผลผ่าตัดถูกซ่อนมองไม่เห็นในท่าปกติ

วัตถุประสงค์: เพื่อศึกษาผลการผ่าตัดระยะแรกของผู้ป่วยที่ได้รับการผ่าตัดต่อมไทรอยด์ผ่านกล้องด้วยเทคนิคลงแผลใต้คางและหลังหู

วัสดุและวิธีการ: ผู้ป่วยที่ได้รับการผ่าตัดต่อมไทรอยด์ผ่านกล้องด้วยเทคนิคลงแผลใต้คางและหลังหูจะถูกเชิญเข้าร่วมโครงการวิจัย โดยผู้วิจัยจะเก็บข้อมูลการวินิจฉัย วิธีผ่าตัด ผลพยาธิวิทยา ผลการผ่าตัดและภาวะแทรกซ้อน หลังการผ่าตัด

ผลการศึกษา: ผู้ป่วยจำนวน 5 รายยินยอมเข้าร่วมโครงการวิจัยนี้ มีอายุตั้งแต่ 30 ถึง 62 ปี ได้รับการวินิจฉัยว่าเป็นก้อนที่ต่อมไทรอยด์ก้อนเดียวและภาวะไทรอยด์ฮอร์โมนปกติ ผู้ป่วย 3 รายได้รับการผ่าตัดแบบ PSA type I และ 2 รายได้รับการผ่าตัดแบบ PSA type II ขนาดก้อนที่ต่อมไทรอยด์อยู่ระหว่าง 3 ถึง 6 เซนติเมตร ใช้เวลาการผ่าตัดเฉลี่ย 180 นาที ไม่มีผู้ป่วยรายใดต้องเปลี่ยนวิธีการผ่าตัดหรือพบภาวะแทรกซ้อนที่รุนแรง

สรุป: การผ่าตัดต่อมไทรอยด์ผ่านกล้องด้วยเทคนิคลงแผลใต้คางและหลังหูเป็นเทคนิคที่สะดวกและทำได้ง่าย แผลผ่าตัดสวยงามและไม่พบภาวะแทรกซ้อนรุนแรง