

Transoral endoscopic thyroidectomy / parathyroidectomy – a new approach

BY JENNY WALTON, RAM MOORTHY AND SIDHARTHA NAGALA

Historically, scarless surgery has been popular in certain cultures. But is it gaining traction around the world? A UK team tell us more.

Background

Alternative, remote access approaches to thyroidectomy and parathyroidectomy are increasing in popularity, the newest of these being the transoral vestibular route; a scarless approach described by Anuwong in Thailand in 2016 [1]. In November 2022, the first transoral endoscopic parathyroidectomy vestibular approach (TOEPVA) was performed in Reading, UK, by a team led by consultant surgeons

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Ram Moorthy and Sid Nagala. The clear advantage of this approach is that it is truly scarless, but there are also several other benefits. The surgeon operates in a field in which they are already familiar, with a learning curve in the region of only 11–15 cases. The required laparoscopic equipment is already widely available.

Setting up the service

Implementation of TOETVA/TOEPVA in Reading followed the IDEAL framework [2], a process enabling professional societies and regulators to provide best practice recommendations for surgical innovation. The following steps describe this process in the context of TOET/PVA:

- Approval obtained from the Royal Berkshire Hospital (RBH) and the British Association of Endocrine and Thyroid Surgeons (BAETS) to ensure robust governance processes.
- The lead surgeons undertook observerships and cadaveric dissection courses.

- Dr Jon Russell (Johns Hopkins) was approached to fulfill the role of proctor (an account of setting up TOET/PVA can be found in Russell’s 2019 paper) [3].
- Cost implications were calculated and funding secured via charitable and industry sponsors.
- Preparation meetings were held with the surgeons, anaesthetists, ward and theatre teams.
- A patient was selected and fully consented to be the first to undergo the procedure in the UK.

Selecting the right patient

The primary consideration is to choose patients who are highly motivated to participate in a novel technique and keen to avoid a scar (especially if prone to developing hypertrophic or keloid scarring). When selecting the initial cases, we used a modified version of the criteria reported in the literature: see Table 1.

Table 1: Inclusion/exclusion criteria. DTC: differentiated thyroid cancer, RLN: recurrent laryngeal nerve, ASA: American Society of Anaesthesia.

Criteria	Inclusion/exclusion literature	Inclusion/exclusion Reading team
Maximum index nodule dimension	Benign <6cm, Suspicious/DTC <2cm	Benign <4cm Thy1/2/3a/f
Thyroid lobe dimension	<10cm	<6cm
Parathyroid adenoma		Clear plane on ultrasound between thyroid and parathyroid.
Anaesthesia		ASA grade I or II
Graves’/Hashimotos	Included	Excluded
Active hyperthyroidism	Excluded	Excluded
Retrosternal extension	Excluded	Excluded
Previous head and neck surgery/radiation (RT)	Included only if previous transoral approach, RT excluded	Excluded
Preoperative RLN palsy	Excluded	Excluded
Lymph node involvement/extrathyroidal extension	Excluded	Excluded

“TOET/PVA, with its high level of patient satisfaction, is proving an excellent option to take this service forward”



Figure 1: Dilatation of the port site.

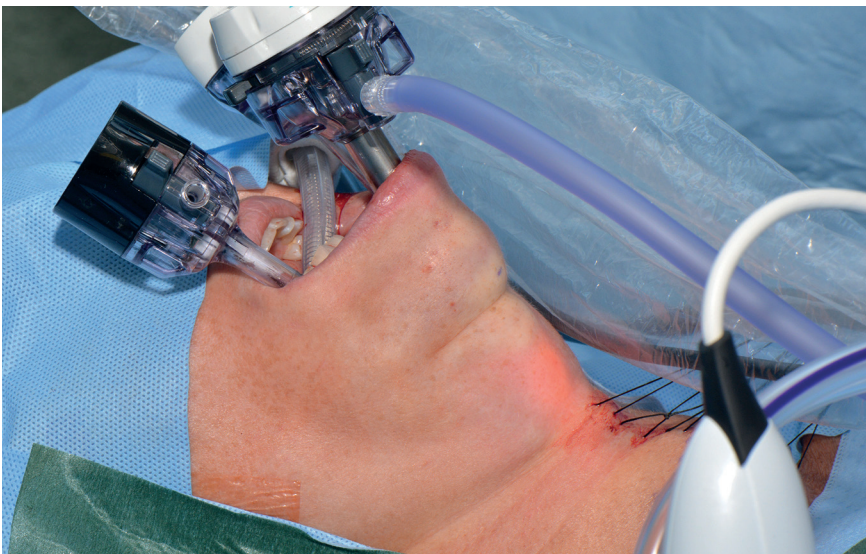


Figure 2: Placement of the ports. Note the position of the silk sutures.

8. A 10mm 0° degree laparoscopic camera is inserted via central port, Marylands grasper / energy device (advanced bipolar or ultrasonic scalpel) via lateral ports.
9. Strap muscles opened in midline, separated from thyroid and retracted laterally: an externally hanging suture through the straps may assist with retraction.
10. Lateral dissection around thyroid to mobilise lobe; can also locate the adenoma if performing a parathyroidectomy.
11. For a thyroid lobectomy, the isthmus is divided and superior pedicle divided close to the gland.
12. Pedicle retracted inferiorly, superior parathyroid identified and preserved.
13. Recurrent laryngeal nerve (RLN) identified using the superior approach as it enters the larynx.
14. Rest of lobe mobilised, inferior parathyroid identified and preserved.
15. Specimen removed via the central port using specimen retrieval bag.
16. Meticulous haemostasis, Tisseal/ Surgiflo is placed in the central neck, closure of intraoral incisions with Vicryl Rapide.
17. Postop – pressure bandage for 24 hours, five days of oral antibiotics.

What are the possible risks?

TOETVA/TOEPVA has a small number of unique risks as well as the usual risks of haematoma, infection, superior or recurrent laryngeal nerve (RLN) damage, need for postop thyroxine and hypocalcaemia. Unique risks include self-limiting swelling around the lower lip, altered sensation around the chin / mouth due to damage to the mental nerve, perforation or damage to the chin / anterior neck skin, conversion to open (around 1.3%) and a very small (0.6%) risk of carbon dioxide embolus [4]. The risk of postoperative haematoma is very low (0.5%). Aside from its unique risks, the rate of all other directly comparable risks has been regularly reported to be no different compared to open [5].

Patient outcomes in the Reading group

To date, a total of 10 transoral procedures have been carried out in our centre (see Table 2). Overall, patient satisfaction has been extremely high. The main postoperative complaint is pain around the mental region; the anaesthetic approach and postoperative analgesia has been optimised to take account of this. Most patients were successfully discharged on day one.

TOETVA: the procedure

A video of one of the first parathyroidectomies performed via transoral approach in our centre can be found by scanning the QR code. The steps are as follows:



1. Oral intubation with broad-spectrum antibiotic at induction of anaesthesia.
2. Neck marked as if for open approach (in case need to convert).
3. Three oral incisions (one central and two lateral) marked, infiltration with local anaesthetic (bupivacaine 0.25% with adrenaline).
4. Central incision – 10mm ‘inverted U’ port site widened with Kelly forceps over chin, into subplatysmal plane and dilated with Hagar dilators (Figure 1), 10mm laparoscopic port introduced (Figure 2).
5. Two lateral stab incisions made, 5mm laparoscopic ports inserted.
6. Working space is insufflated with CO₂ to 6mmHg (low pressure reducing the risk of CO₂ embolus or subcutaneous emphysema). Lateral ports kept open to prevent CO₂ accumulation.
7. Silk sutures introduced through anterior neck skin from tip of the central port to sternal notch to optimise working space.

Table 2: Our first 10 cases. FVPTC: follicular variant papillary thyroid carcinoma, PTC: papillary thyroid carcinoma.

Case: age/sex	Operation	Pathology / Outcome
46 female	Targeted parathyroidectomy	1.9cm adenoma – cure
65 male	Targeted parathyroidectomy	2cm adenoma – cure
36 female	Targeted parathyroidectomy	1.8cm adenoma – cure
37 female	Left TR5/Thy3f nodule, hemithyroidectomy	8mm FVPTC
43 female	16mm TR3 isthmic nodule, Isthmusectomy	Follicular adenoma
45 female	25mm U3/ Thy3a isthmic nodule, Isthmusectomy	Adenomatoid nodule
29 female	13mm/14mm TR5/Thy3a isthmic nodules, Isthmusectomy	28mm PTC
31 female	Targeted parathyroidectomy	1.3cm adenoma – cure
41 female	16mm TR2/13mm TR3 right thyroid nodules, hemithyroidectomy	Follicular nodular disease
41 female	Targeted parathyroidectomy	1.5cm adenoma – cure

Future steps

There is rapidly growing interest in scarless approaches in the UK. TOET/PVA, with its high level of patient satisfaction, is proving an excellent option to take this service forward. The first UK Remote Access Thyroid Surgery (UKRATS) Conference was held in May 2024 in London, with worldwide experts sharing their experience with delegates. There are some excellent dissection courses available, including the first UK cadaveric course held in Keele in January 2024 (see <https://transorals.org> for Thailand courses) and the team behind UKRATS are looking to incorporate such a course in the conference next year. Whilst evolution of TOET/PVA currently remains in the Exploration phase of the IDEAL framework, increasing numbers of adoptees of the approach will lead to the ability to perform high-quality prospective trials to assess the short and long-term outcomes, complications and functional results with the eventual goal of NICE approval.

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The team that performed the first UK transoral case.

Declaration of competing interests:
None declared.