



Survey of clinician perspective on management of papillary thyroid microcarcinoma in Australia and New Zealand

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Background: The incidence of thyroid cancer has been rapidly increasing in recent years largely due to improved diagnostic methods. There is evidence to suggest that in papillary thyroid microcarcinoma (PTMC), active surveillance (AS) is comparable in effectiveness compared to immediate surgery (IM). We conducted a survey of Clinicians and Surgeons from Australia and New Zealand to assess the role of AS in the management of PTMC.

Methods: A short electronic survey was created on the platform Survey Monkey, separate links containing the survey were sent to various medical societies to be distributed to its members. The list of medical societies included: General Surgeons Australia, Endocrine Society of Australia, Australian and New Zealand Endocrine Surgeons, Australian and New Zealand Head and Neck Cancer Society and New Zealand Association of General Surgery.

Results: We received 110 complete responses, which demonstrated that 63% of clinicians will discuss AS with patients diagnosed with PTMC. Surgeons are more likely to discuss AS compared to endocrinologists ($P=0.03$). Forty-eight percent of respondents report managing patients with AS in the past year, those who are able to perform thyroid ultrasounds are more likely to utilise AS ($P=0.03$). Common perceived barriers to AS include patient anxiety, lack of access to regular follow-up and lack of patient compliance.

Conclusions: Our survey shows that Australian and New Zealand clinicians are generally aware of AS as a treatment option for PTMC, but there remain considerable barriers for common implementation.

Keywords: Papillary thyroid microcarcinoma (PTMC); thyroid cancer; active surveillance (AS)

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Introduction

Background

Over the last 30 years, there has been a rapid increase in the incidence of thyroid cancer globally (1-4). There has been a five-fold increase in the incidence of thyroid cancer in Australia between 1982 (2.8/100,000) and 2022 (14/100,000) (2). In particular, the incidence of small papillary carcinomas has

increased, while incidences of follicular, medullary, anaplastic and larger papillary carcinomas remain largely stable (5). This is largely attributed to improvement in diagnostics rather than a true increase in incidence; in particular, the increased use of ultrasound scans coupled with fine needle sampling has been noted to contribute to increased diagnosis (2,6). The prevalence of occult papillary thyroid tumours has been estimated to be as high as 30% in autopsy studies (7). A study

by Lortet-Tieulent *et al.* [2019] (8) extracted population-based cancer registry data from fifty-five countries, which demonstrated that while incidence of thyroid cancer varied greatly (up to 50-fold), the mortality rate was uniformly low (8). In addition, high-income countries and urban areas in low-income countries showed high incidence, which suggests that the increased incidence is driven by over-diagnosis of indolent thyroid cancers (8).

Rationale and knowledge gap

Papillary thyroid microcarcinomas (PTMC) are tumours less than 1cm in size, they account for around 50% of diagnosed cases of thyroid cancer (5,9). They range from aggressive metastatic cancers to indolent tumours that have excellent prognosis (9). Traditionally, the recommendation for all primary thyroid malignancy proven with cytology is immediate surgery (IM), including for PTMCs (10). But this approach is debatable for the large portion of PTMCs that are slow growing (9,11). Active surveillance (AS) is a management approach where the patient is closely and regularly monitored, with offer of rescue surgery when the disease has progressed; it has been proposed as an alternative to IM (12). Several clinical trials from around the globe provided good evidence that AS is as safe as immediate surgery for low-risk T1N0M0 PTMC,

whilst being associated with significantly lower rates of surgical complications such as vocal cord paralysis and hypoparathyroidism (5,9,13,14). Additionally, patients can avoid undergoing hormone replacement therapy when they are on AS (15). However, the cost of regular follow-up in AS and the psychological burden on the patients associated with having cancer are disadvantages of AS compared to IM (15). Based on current evidence, AS of low-risk PTMC has been adopted by the American Thyroid Association in 2015 (16).

Sugitani *et al.* [2019] (17) conducted a survey of Japanese endocrine surgical centres on attitudes towards AS for management of PTMC, the majority of respondents reported that they discuss AS with their patients, but its practice is not standard and varies by institution (17). We are interested in conducting a similar survey to investigate the opinions of Australian and New Zealand clinicians who manage PTMC.

Objectives

Currently, Australia and New Zealand both use the American Thyroid Association evidence-based guidelines (2015 version) in the management of thyroid cancer, which suggests that AS should be considered for low risk PTMC; however, the authors noted that this is not routinely practiced at the time of writing (10). Therefore, we were interested in conducting a survey in Australia and New Zealand, sampling current attitudes towards AS and investigating the barrier faced by clinicians. We hope that this contributes to the optimisation of the sociomedical environment, in order to minimise overtreatment of PTMC. We present this article in accordance with the SURGE reporting checklist (available at <https://gs.amegroups.com/article/view/10.21037/gS-24-25/rc>).

Methods

Survey distribution and data collection

A multiple-choice questionnaire was developed on the electronic platform Survey Monkey with three sections: current PTMC management (including indications for fine-needle aspiration biopsy, indications for surgery and treatment options provided to patients), perceived barriers to AS and demographic information of the surveyed medical practitioner (including age, gender, specialty, location of main practice, number of cases treated and type of primary practice). Author L.W. contacted the

Highlight box

Key findings

- Sixty-three percent of surveyed clinicians will discuss active surveillance (AS) with patients diagnosed with papillary thyroid microcarcinoma (PTMC). Surgeons are more likely to discuss AS compared to endocrinologists (P=0.03).
- Forty-eight percent of respondents report managing patients with AS in the past year, those who are able to perform thyroid ultrasounds are more likely to utilise AS (P=0.03).
- Common perceived barriers to AS include patient anxiety, lack of access to regular follow up and lack of patient compliance.

What is known and what is new?

- Evidence-based guidelines suggest AS should be considered as a management strategy for low-risk PTMCs.
- Our survey shows that majority of clinicians in Australia and New Zealand discuss AS, but immediate surgery is overall recommended more frequently.

What is the implication, and what should change now?

- There still remain considerable barriers for common implementation of AS in Australia and New Zealand.

Table 1 Demographics of surveyed clinicians

Subgroups	Values
Specialty	
Endocrinologist	39 [36]
Endocrine surgeon	38 [34]
Head and neck surgeon	10 [9]
General surgeon	18 [16]
Ear, nose and throat surgeon	5 [5]
Location of primary practice	
Tertiary referral hospital	65 [59]
Regional or rural hospital	23 [21]
Private hospital	17 [15]
Other types of practice	5 [5]
Years of medical practice	
<10	27 [25]
10–20	35 [32]
21–30	26 [24]
>30	22 [20]
Total number of thyroid surgeries performed in the past year (surgeons only, N=71)	
<25 cases	21 [30]
25–50 cases	16 [23]
51–100 cases	18 [25]
>100 cases	16 [23]
Number of cT1aN0M0 PTMC treated in the past year	
0	18 [16]
1–10	60 [55]
11–20	18 [16]
21–30	8 [7]
30+	6 [5]
Ability to perform own thyroid ultrasound	
Yes	37 [33.6]
No	73 [66.4]

Data are shown as n [%]. PTMC, papillary thyroid microcarcinoma.

following medical societies for participation: Australian and New Zealand Endocrine Surgeons (ANZES), General Surgeons of Australia (GSA), New Zealand Association of General Surgery (NZAGS), Australian and New Zealand

Head and Neck Cancer Society (ANHNCS), Australasian Society of Otolaryngology and Head and Neck Surgery (ASOHNS) and Endocrine Society of Australia (ESA). Members of the above medical societies received an email invitation containing a brief description of the study along with a survey weblink. All entries to the questionnaire were anonymous, without the possibility to identify individual participants. Participants could withdraw from the study at any time by closing the web link without completion of the questions; no data was stored if the questionnaire was not completed in full prior to closing of the web link window. A reminder email was sent to the members of each of the medical societies two weeks after the initial email, and the survey was closed four weeks after the initial invitation. No financial or other incentives were provided to participants. Raw response data was subsequently downloaded from the Survey Monkey in form of Excel tables.

Ethical approval

This project was conducted in accordance with the Declaration of Helsinki (as revised in 2013). It was approved by the Nepean Blue Mountains Local Health District HREC on 10th September 2020 (ID#: 2020/ETH01848). Participants were informed of the nature of the data collected and the scope of this survey project in the invitation letter, consent is implied if a participant complete and submit their response. We did not create a separate form to specifically document consent.

Statistical analysis

Statistical analysis was performed using the in-built functions of RStudio software version 1.3.1093, statistical tests utilised include Fisher's exact test, two-sample *t*-test, one-way analysis of variance (ANOVA) (18). A *P* value <0.05 was considered statistically significant.

Results

Following the removal of 17 incomplete responses and 1 duplicate response, a total of 110 complete responses were included in analysis. Participant demographics are summarised in *Table 1*. Approximately one third of respondents were endocrinologists, one third comprise of endocrine surgeons and the remainder were surgeons from other specialties (such as ear nose throat, head and neck and general surgeons). The majority of the respondents work

Table 2 Demographic differences between clinicians of different specialties surveyed

Demographic characteristics	Endocrine surgeon (38 total)	General surgeon (18 total)	ENT surgeon (5 total)	Head & Neck surgeon (10 total)	Endocrinologist (39 total)
Most common location of primary practice	Tertiary referral hospital	Regional or rural hospital	Tertiary referral hospital	Tertiary referral hospital	Tertiary referral hospital
Average number of years in practice	18.58	26.11	21.80	22.20	20.46
Average number of PTMC managed in past year	12.26	2.22	16.20	17.40	6.49
Average number of thyroid surgeries in past year	126.95	18.00	53.00	71.50	0.00
Ability to perform own thyroid ultrasound	68%	17%	40%	40%	5%

PTMC, papillary thyroid microcarcinoma; ENT, ear, nose and throat.

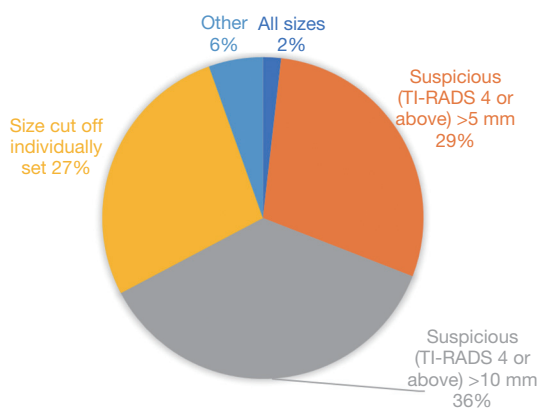


Figure 1 Indications for fine needle biopsy. TI-RADS, Thyroid Imaging Reporting and Data System.

primarily in tertiary referral hospitals (59%), others report primary location of work as regional hospitals (15%) or private hospitals (15%). The majority of respondents were senior clinicians with 75% reporting more than 10 years of medical practice, and 20% reporting more than 30 years of medical practice. The majority of clinicians (84%) surveyed reported treating at least one case of PTMC (cT1aN0M0) in the past year. More than 70% of surgeons surveyed reported that they performed more than 25 cases of thyroid surgery in the past year, and 48% reported more than 50 cases. *Table 2* details the differences in demographic factors between the various specialties surveyed. There are no significant differences between the specialties in terms of seniority ($P=0.83$, one-way ANOVA) or total number of PTMC managed in the past year ($P=0.92$, one-way ANOVA).

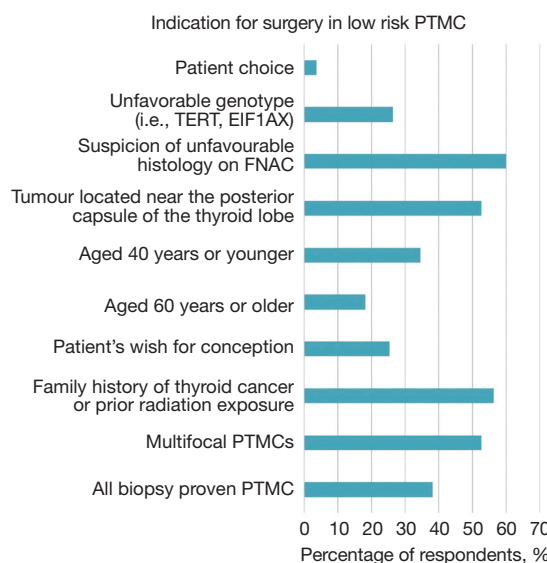


Figure 2 Indications for immediate surgery. PTMC, papillary thyroid microcarcinoma; TERT, telomerase reverse transcriptase; EIF1AX, eukaryotic translation initiation factor 1A, X-chromosomal; FNAC, fine needle aspiration cytology.

However, surgeons are significantly more likely to be able to perform their own thyroid ultrasound ($P<0.001$, Fisher's exact test).

The respondents answered a series of questions regarding their management of PTMCs. The first question in this section pertains to indications for fine needle assisted biopsy (*Figure 1*). They were asked about their indications for immediate thyroid surgery from a given list (*Figure 2*), 38% of respondents reported that they recommend surgery

for all biopsy proven PTMCs. Other commonly selected indications include suspicion of unfavourable histology on fine needle aspiration cytology (FNAC) (60%), family history or prior radiation exposure (56%) and multifocal PTMCs (53%). When asked about how they discuss

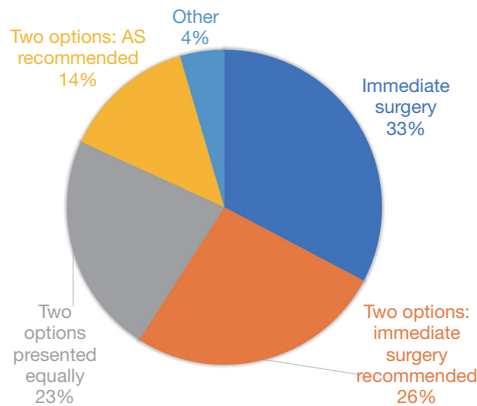


Figure 3 Discussion of the two different management options for PTMC: immediate surgery or active surveillance. AS, active surveillance; PTMC, papillary thyroid microcarcinoma.

PTMC management with patients, 63% of clinicians reported discussing AS with patients (*Figure 3*). Surgeons (rate =74.6%) are significantly more likely to discuss AS compared to endocrinologists (rate =53.8%) ($P=0.03$). *Table 3* illustrates how factors like specialty, location of practice and seniority influence whether AS is discussed. Out of the 92 clinicians who treated PTMC in the past year, 44 of them report utilising AS (48%). The rate of AS uptake amongst clinicians who have managed cT1aN0M0 PTMC in the past year is significantly higher in those who are able to perform their own thyroid ultrasound; but does not appear to be significantly different between surgeons and endocrinologists ($P=0.25$), clinicians with different levels of seniority ($P=0.99$) or clinicians with different locations of primary practice ($P=0.92$) (*Table 4*).

Respondents were asked about perceived barriers to AS, they were asked to rate each potential barrier with a score of concern (1= not a barrier....and 5= absolute barrier). *Figure 4* displays the percentage of clinicians who rated each proposed barrier a score of 4 or more, the top three concerns were patient anxiety about cancer diagnosis, lack of patient compliance and lack of patient access to regular

Table 3 Active surveillance amongst different subgroups

Subgroups	Rate of discussion (No. clinicians discussing AS/total No. in subgroup)	P
Specialty		
Endocrinologist	53.8% (21/39)	0.03
Surgeon	74.6% (53/71)	
Seniority		
<10 years	59.3% (16/27)	0.26
10–20 years	65.7% (23/35)	
21–30 years	50.0% (13/26)	
>30 years	77.3% (17/22)	
Location of primary practice		
Tertiary referral hospital	61.5% (40/65)	0.66
Regional or rural hospital	65.2% (15/23)	
Private hospital	40.0% (2/5)	
Other types of practice	70.6% (12/17)	
Ability to perform own thyroid ultrasound		
Yes	72.7% (24/33)	0.38
No	62.5% (45/72)	

Differences between subgroups tested using Fisher's exact test. AS, active surveillance.

Table 4 Uptake of active surveillance within the past year amongst different subgroups

Subgroups	Rate of uptake (No. of clinicians utilising AS/total No. in subgroup)	P
Specialty		
Endocrinologist	37.0% (10/27)	0.25
Surgeon	52.3% (34/65)	
Seniority		
<10 years	47.6% (10/21)	0.99
10–20 years	44.8% (13/29)	
21–30 years	52.2% (12/23)	
>30 years	47.4% (9/19)	
Location of primary practice		
Tertiary referral hospital	45.3% (24/53)	0.92
Regional or rural hospital	55.0% (11/20)	
Private hospital	50.0% (2/4)	
Other types of practice	46.7% (7/15)	
Ability to perform own thyroid ultrasound		
Yes	62.9% (22/35)	0.03
No	38.6% (22/57)	

Differences between subgroups tested using Fisher’s exact test (respondents who did not treat patients with PTMC in the past year were excluded from this analysis). AS, active surveillance; PTMC, papillary thyroid microcarcinoma.

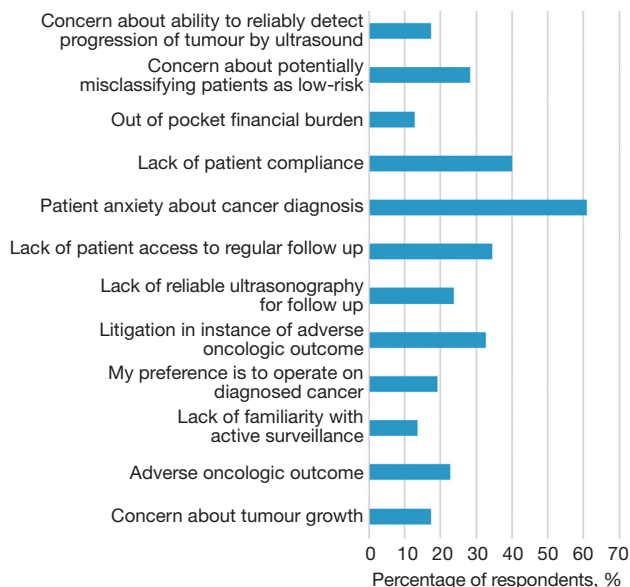


Figure 4 Percentage of respondent who have scored 4 or above in their rating for each proposed barrier to active surveillance.

follow-up. Endocrinologists had a higher-than-average concern score compared to surgeons (P=0.046); but factors such as ability to perform ultrasound (P=0.057), seniority (P=0.18) and location of primary practice (P=0.87) did not appear to affect level of concern (Table 5).

Discussion

Key findings, explanations & comparison to prior research

This study is the first known survey to investigate how low-risk PTMCs are managed in Australia and New Zealand. Based on the estimated size of each of the respondent societies, the survey response rate is 3.3%; however, this figure is most likely an under-estimate of the true response rate from clinicians that treat thyroid cancer. The first reason for this is inability to account for crossover between surveyed societies, which is likely significant as both head and neck surgery and endocrine surgery are considered sub-

Table 5 Average concern score amongst different subgroups across all proposed barriers to active surveillance

Subgroups	Average concern score	P
Specialty		0.046
Endocrinologist	2.809	
Surgeon	2.520	
Location of primary practice		0.87
Tertiary referral hospital	2.619	
Regional or rural hospital	2.634	
Private hospital	2.867	
Other types of practice	2.549	
Seniority		0.18
<10 years	2.880	
10–20 years	2.588	
21–30 years	2.564	
>30 years	2.432	
Ability to perform own thyroid ultrasound		0.057
Yes	2.432	
No	2.719	

Differences between specialties and ability to perform ultrasound tested using two-sample *t*-test, differences between location of primary practice and seniority tested using one-way analysis of variance model.

specialties of general surgery in Australia. The second reason is that the two biggest surveyed societies (General Surgeons of Australia and New Zealand Association of General Surgery, accounting for half of the total population clinicians that we surveyed) contained many clinicians from other surgical sub-specialties such as colorectal surgeons that do not directly treat thyroid disease. A different way of estimating true response rate is looking at the reported number of cases of cT1aN0M0 PTMC managed in the past year. Based on estimated yearly incidence of thyroid cancer in Australia and New Zealand, there are roughly 1,200 cases of cT1aN0M0 PTMC diagnosed each year in total between these two countries (9,19–21). The total reported number of cT1aN0M0 PTMC managed in the past year by surveyed surgeons is 761 (the cases managed by endocrinologists are not counted here as there is high likelihood of double counting due to shared patients), this is an indication that we have surveyed a representative sample of clinicians that manage this issue. The total reported number of

cT1aN0M0 PTMC managed by surveyed endocrinologists is 253. There are two possible explanations for this number being lower than the total reported by the surgeons. Firstly, our coverage of surveyed endocrinologists may not have been extensive as that of surgeons, as we did not survey the New Zealand Society of Endocrinology. Secondly, given the indolent nature of PTMCs, many cases do not cause symptomatic changes in thyroid hormone levels, hence may never get referred to endocrinology. Our survey covered a good mixture of clinicians from different specialties, location of practice and seniority, which is an advantage as it gives a more balanced overview of clinician opinions.

The findings show that very few respondents are unselective about fine needle biopsy, which is reassuring. The majority responded that they would biopsy TI-RADS 4 or above thyroid nodules greater than 10 mm. This is slightly more cautious than the TI-RADS criteria which recommend biopsy for TI-RADS 4 nodule if they are above 15 mm and TI-RADS 5 nodules if they are above 10 mm (22). A couple of respondents commented that they consider additional risk factors for thyroid cancer such as family history of thyroid cancer or history of radiation exposure to neck when making decisions regarding biopsy. This survey found that 63% of the clinicians discuss AS with their patients to some extent, which shows that awareness of this treatment option is relatively high. However, this is substantially lower compared by the discussion rate found in the survey by Sugitani *et al.* on Japanese institutions (96.2% clinicians discussed AS), this reveals that Australian and New Zealand clinicians are overall more cautious in their management of PTMC compared to international standards (17).

The most common location of primary practice for all specialties is a tertiary referral centre, with exception of general surgeons, who more commonly practice in region or rule centres. This is not surprising as sub-specialists are more likely to work at tertiary centres. Endocrine surgeons perform more thyroid surgeries compared to the other surgeons, which is expected of their subspecialty. Surgeons overall are more likely to be able to perform their own thyroid ultrasounds compared to endocrinologists, this is likely due to the fact that surgeons are more procedurally inclined, and their work pertains more to patient anatomy.

It is interesting that we found endocrinologist are significantly less likely to discuss AS with their patients compared to surgeons, but the rate of AS uptake is no different between these two groups. This may be explained by either they are more concerned regarding AS as a group by endocrinologists, or that they are more likely to defer the

discussion to surgical colleagues. Clinicians who are able to perform their own thyroid ultrasound are significantly more likely to have employed AS in the past year, this may be due to better patient access to follow up and higher clinician confidence in monitoring the PTMC. The correlation between surgical specialties and ability to perform own thyroid ultrasounds may be another reason explaining increased likelihood of AS discussion. This suggests that we could consider investing into increasing ultrasound training among clinicians as a step in eliminating barriers to AS.

The main barriers to AS from clinicians' perspective appear to be perceived patient anxiety about cancer diagnosis, lack of patient compliance and lack of patient access to follow up. These findings echo the results of a recent similar survey of physicians in United States, which demonstrates that the difficulties encountered by clinicians in Australia and New Zealand are certainly not unique (23). Again, endocrinologists had significantly higher average concern score compared to surgeons. This difference may be due to differences in training, variations in circulated research regarding AS and different experiences with managing post-operative complications, which would affect clinician's judgement of relative risk and benefit of surgery versus AS.

Strengths and limitations

Based on our calculations of number of PTMCs managed by surveyed clinicians and total number of new cases of PTMC in a year, we have surveyed a reasonably representative sample of clinicians that treat this condition. The survey targets both physicians and surgeons and offers insight into differences in the perspectives in clinicians from different specialties. Furthermore, we investigated some of the factors that affect clinicians' tendency to offer AS, including seniority, location of practice and ultrasound skills.

There are several limitations to this study. Firstly, due to the nature of a survey study, all recorded data are self-reported rather than objectively measured, which limits accuracy and inevitably introduces bias. Secondly, the survey was carried out during the COVID-19 pandemic at a time when clinical resources were under strain, which undoubtedly disrupted normal clinical practice and made outpatient follow-up more difficult. This may have been an additional barrier to AS and affected clinical practice. Thirdly, this study has a relatively small sample size. Lastly, we were unable to collect aggregate demographic data from participants' societies, which meant that we were unable

to calibrate the survey results to population benchmarks. This means we are unable to determine or calibrate for the selection bias present within the data. For example, we do not know if surgeons who have more years of practice are under-represented in the survey because they may be less inclined to respond to an electronic survey.

Implications

Despite awareness of AS, there remain significant barriers to its implementation for PTMC in Australia and New Zealand. In order to promote AS, there should be better coordination between members of multi-disciplinary teams, patient education regarding AS and improved facilities for patient follow up. A number of clinical decision tools now exist to aid patient selection for AS, which will hopefully promote its utilisation (16,24,25).

Conclusions

Our survey found that most Australian clinicians treating PTMC are aware of AS as an alternative to immediate surgery, but significant barriers still remain for wider implementation of AS. Those from surgical specialities appear more likely to discuss AS, while those who are able to perform their own thyroid ultrasounds are more likely to uptake this form of treatment.

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Footnote

Reporting Checklist: The authors have completed the SURGE reporting checklist. Available at <https://gs.amegroups.com/article/view/10.21037/gS-24-25/rc>

Data Sharing Statement: Available at <https://gs.amegroups.com/article/view/10.21037/gS-24-25/dss>

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Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <https://gs.amegroups.com/article/view/10.21037/gS-24-25/coif>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. This project was conducted in accordance with the Declaration of Helsinki (as revised in 2013). It was approved by the Nepean Blue Mountains Local Health District HREC on 10th September 2020 (ID#: 2020/ETH01848). Participants were informed of the nature of the data collected and the scope of this survey project in the invitation letter, consent is implied if a participant complete and submit their response. We did not create a separate form to specifically document consent.

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