



# Thyroid Cancer Screening: How to Maximize Its Benefits and Minimize Its Harms

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Concerns have been raised regarding the current practice of thyroid cancer screening in South Korea in light of the explosive increase in the incidence of thyroid cancer. Thyroid ultrasonography is easily accessible and is frequently followed by diagnostic procedures, leading to a marked increase in surgical operations. This has led to the suggestion of eliminating screening for asymptomatic adults, as national epidemiological data were presented that indicated overdiagnosis and overtreatment of thyroid cancer without a favorable impact on thyroid cancer mortality [1,2]. However, debate continues regarding whether there is adequate clinical evidence to recommend or eliminate thyroid cancer screening. Thyroid cancer screening is most frequently performed using ultrasonography, which is essentially harmless and allows the early detection of thyroid cancer. The challenges lie in dealing with screening outcomes, and establishing optimized criteria for performing diagnostic procedures and subsequent management strategies is crucial. We herein present our perspectives on thyroid cancer screening and propose ways to optimize the diagnosis and treatment of screening-detected thyroid nodules to maximize the benefits and minimize the harms of thyroid cancer screening.

Unlike the claims based on previously reported epidemiological data, recent studies have demonstrated survival benefits from the early detection of thyroid cancer. A recent meta-analysis of 12 eligible studies showed that the risk of recurrence and

thyroid cancer mortality was lower in patients with incidentally detected thyroid cancer than in patients with clinically detected thyroid cancer [3]. Moreover, a nationwide cohort study with 4,439 Korean patients reported that cases of clinically detected thyroid cancer had more advanced staging, larger tumor size, a higher likelihood of extrathyroidal extension, and significantly higher mortality risk than cases of screening-detected thyroid cancer [4]. These studies provide evidence contradicting the belief that screening does affect thyroid cancer mortality. In addition, clinically detected thyroid cancer with a palpable nodal neck mass, thyroid mass fixation, and hoarseness invariably indicates an advanced tumor stage with the involvement of adjacent structures and nodal metastases. Hence, patient selection for ultrasonography according to clinical symptoms results in screening for advanced thyroid cancer, which causes significant morbidity and mortality.

While recent studies have shown that thyroid cancer screening has survival benefits, joint efforts are required to minimize unnecessary biopsies and surgical interventions for low-risk papillary thyroid microcarcinoma. A recent comprehensive review of fine-needle aspiration reported a low incidence of complications [5]. Moreover, a retrospective study with 6,687 thyroid nodules reported that the complication rate of core needle biopsy was 0.81% and the major complication rate was 0.06%, while none of the patients experienced permanent problems re-

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sulting from complications [6]. In order to minimize the harms associated with diagnostic procedures, scrupulous selection of screening-detected thyroid nodules for diagnostic procedures is important. The Korean Society of Thyroid Radiology is actively seeking to reduce the number of unnecessary diagnostic procedures by providing regularly updated, evidence-based guidelines. A previous study showed that, according to existing practice guidelines, the diagnostic performance and unnecessary biopsy rate are strongly influenced by the nodule size cutoff [7]. With the updated 2021 Korean Thyroid Imaging Reporting and Data System (K-TIRADS) 1.5, the unnecessary biopsy rate was substantially lower than that of the 2016 K-TIRADS and comparable to that of the American College of Radiology Thyroid Imaging Reporting and Data System (ACR-TIRADS) [8]. This suggests that establishing optimized practice guidelines with appropriate imaging and biopsy size criteria is the key to minimizing the potential harms associated with diagnostic procedures performed in cases of screening-detected thyroid cancer.

Moreover, active surveillance should be readily incorporated into clinical practice as an alternative to immediate surgery for low-risk papillary thyroid carcinoma measuring up to 1 cm, as reflected in the 2015 guidelines of the American Thyroid Association [9]. The main concern of active surveillance lies with the anxiety experienced by both patients and physicians. In addition, young age (less than 40 years) and male sex were associated with poor clinical outcomes, and young men are considered a high-risk group with relatively rapid progression during active surveillance. Hence, systematic guidelines for patient selection and a surveillance protocol should be established. Multicenter cohort studies are being performed in South Korea to establish and refine national patient selection criteria for active surveillance to minimize unnecessary or inappropriate surgery [10,11].

More evidence is accumulating to support the survival benefit of screening, which enables the early detection of thyroid cancer. Screening with ultrasonography itself is harmless, while it is necessary to refine image-based risk stratification to optimize patient selection for diagnostic procedures and minimize surgical interventions. The unnecessary biopsy rate should be minimized by adhering to updated guidelines, and low-risk papillary thyroid microcarcinoma should be managed conservatively with active surveillance.

## CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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