

Lecture One: Thermal Ablation for PTC — What Challenges Are We Facing?

This lecture examines the frontier challenges in thermal ablation for papillary thyroid carcinoma (PTC), moving beyond the established evidence base for low-risk microcarcinomas toward the more complex clinical scenarios now confronting practitioners.

The lecture opens with a brief review of the current landscape, acknowledging that ablation for low-risk, solitary T1a PTC is now well-supported by multicentre data and incorporated into several major guidelines. However, the field is rapidly evolving, and the following unresolved challenges will be discussed in depth.

The first challenge is the ablation of T2-stage tumours. While thermal ablation has demonstrated reliable efficacy for nodules under 1 cm, T2-stage disease — with a maximum diameter exceeding 2 cm — presents substantially greater technical complexity. Issues include ensuring complete ablation zone coverage with adequate margins, managing the increased thermal field required, and the risk of incomplete treatment at the tumour periphery. The lecture will review emerging evidence and examine whether ablation can be considered a viable alternative to surgery in carefully selected T2 patients.

The second challenge concerns the balance between extended ablation margins and thyroid tissue preservation. A fundamental tension exists between the oncological imperative to achieve wide, clear ablation margins — thereby minimising residual tumour risk and local recurrence — and the functional goal of preserving as much healthy thyroid parenchyma as possible to maintain endocrine sufficiency. This balance is particularly acute in patients with bilateral disease or reduced baseline thyroid reserve. The lecture will discuss strategies for margin planning and the current evidence on residual tissue function following ablation.

The third challenge is the management of lymph node metastasis in the context of ablation-based treatment. PTC frequently metastasises to cervical lymph nodes, and the appropriate role of ablation — whether as primary treatment for small nodal metastases or as adjunct therapy — remains contested. The lecture will cover ultrasound-guided ablation of lateral and central compartment nodes, patient selection criteria, and the limitations of ablation compared with surgical lymphadenectomy for bulky or multiple nodal disease.

The fourth and most technically demanding challenge is the management of tumours difficult or high-risk for conventional surgery. This category includes tumours with direct tracheal invasion, where resection carries significant morbidity; patients with extensive or recurrent multiple lymph node metastases where re-operative surgery is hazardous; and patients with serious comorbidities rendering general anaesthesia unsuitable. For such cases, thermal ablation — often in combination with other interventional approaches — may represent the most appropriate management strategy. The lecture will present illustrative cases and discuss the multi-disciplinary decision-making framework required.