

Treatment of benign thyroid nodules by thermal laser or radiofrequency ablation

Spanish full text

Introduction: thyroid nodular pathology has a high prevalence in the general population, affecting more than 50% of healthy people. Most thyroid nodules (TN) are benign and asymptomatic, stable in size and do not require treatment. However, some may grow progressively and without control, leading to pain, hoarseness, dysphagia or dyspnea, as well as alterations of an aesthetic nature that make treatment necessary. Currently, surgery is considered the treatment of choice, and like other surgical interventions requiring general anaesthesia, is not without risks. However, in high-risk surgical patients or those who reject surgery, less invasive alternatives are proposed, such as image-guided thermal ablation procedures, whose objective is to reduce the volume of TN and improve local symptomatology and aesthetics. These include laser ablation (LA) and radiofrequency (RF) ablation, whose benefit/risk balance, ambulatory nature and rapid patient recovery times seem to favour their use.

Objectives: to assess the safety and clinical effectiveness of thermal laser and radiofrequency ablation in the treatment of symptomatic benign solid TN compared to standard treatment (surgery or surveillance).

Methods: a review of the scientific literature was carried out without time limitation until November 2018 in repositories of clinical practice guidelines (G-I-N, National Guideline Clearinghouse, SIGN and Tripdatabase), specialized databases of evaluation reports and systematic reviews (HTA, CRD, INAHTA, the Cochrane Library Plus), general databases (Medline, Embase and ISI Wok) and clinical trials (ClinicalTrial.gov). In order to complete this phase, a manual review of the bibliography cited in these articles and additional searches of meta-search engines and websites of national and international scientific organisations and/or societies were carried out. Two independent reviewers reviewed the articles resulting from the automated search and selected studies based on previously established inclusion and exclusion criteria. All of the information was extracted from evidence tables and analysed in pairs, taking into account the risk of bias of the included studies and the quality of the evidence.

Results: the bibliographic search provided 506 references, of which 67 were read in full text, and 13 articles were selected for inclusion because they met the previously established inclusion criteria. To assess the safety and clinical effectiveness of laser ablation (LA) treatment, five studies including 215 TN from 210 patients were selected. In terms of safety, the results show a low rate of major complications (0.95%) and a moderate rate (26%) of minor complications and side effects, among which cervical pain caused by heating stood out. The degree of tolerance expressed by the majority of patients (>90%) was good, in 76% no complications developed, and no changes in gland function were observed, with the patients retaining their euthyroid state. In terms of effectiveness, a progressive reduction in TN volume of close to 63% ($p=0.003$) is indicated at 12 months. Thirty percent of the TNs reduced their volume by at least half ($\geq 50\%$), and 15% had unsatisfactory results. In the case of radiofrequency ablation (RF), 8 studies describing 1549 NT from 1427 patients were selected. In terms of safety, there is a low rate of complications (7.2%), mostly of a mild, transitory and reversible nature (4.6%). Major complications reached 2.6%, of which 0.3% were permanent. Adverse effects accounted for 21%, including warmth, neck discomfort or stiffness, and pain. About 93% of the patients did not develop any complications and the degree of tolerance to the treatment was good. No significant changes in thyroid function were observed. In terms of efficacy, a gradual response to treatment is indicated, reaching an average reduction in

TN volume of 97% ($p < 0.0001$) at the end of the first year. A total of 76% reduced their volume by more than 50%, and 11% disappeared completely. An increase of more than 50% was observed in 3%. Both modalities are highly dependent on the operator's experience.

Discussion: due to the observational nature of most of the studies selected, which because of their methodology are not adequate to confirm hypotheses, the strength of the recommendations is limited and makes it necessary to interpret the results with caution. The average follow-up of most of the studies did not exceed 12 months, which could be considered adequate to assess the results in the short term. However, existing long-term evidence is more limited.

Conclusions: thermal laser and radiofrequency ablation are considered safe and effective procedures for the treatment of benign, solid and symptomatic TNs. They cause a significant volume reduction that is progressive during the first year and suggest the existence of partial growth from the third year onwards in some patients. This reduction is associated with an important clinical improvement, both in cervical symptomatology and aesthetic alterations. Both modalities do not alter thyroid function, present a high degree of tolerance and satisfaction, and are considered highly dependent on the operator's experience. A minimally invasive treatment alternative may be considered in patients who refuse surgery or who present a high surgical risk and do not represent a limitation for subsequent therapeutic actions. However, there is a need for high quality multi-centre studies and follow-up to help resolve existing uncertainties, especially in laser ablation where the evidence is more limited.