

See You There:

7th and 8th of October, Italy, Ferrara, Arcispedale Sant'Anna, **Advanced ECM Course** for Medical Doctors, "La termoablazione percutanea ecoguidata dei tumori del fegato"

From 5th to 8th of November Italy, Rimini, Palacongressi, **AME** (Associazione Medici Endocrinologi) 14th **National Congress** with AACE Italian Chapter Joint Meeting

Safety and clinical usefulness of a new developed percutaneous laser ablation technique for benign thyroid nodules: the Light and Flight Technique. First experience in a Spanish centre.



Mattia Squarcia MD, Servicio de Neurorradiología

Felicia Alexandra Hanzu MD, Servicio de Endocrinología y Nutrición

Mireia Mora MD, Servicio de Endocrinología y Nutrición
Hospital Clínic de Barcelona, Barcelona.

Background

Percutaneous laser ablation represents, in selected patients with benign thyroid nodules an alternative minimally invasive, efficient and low cost therapy, sparing thyroid function with minimal local chronic complications.

At our centre, we started performing image-guided laser ablations of benign thyroid nodules in March 2014 in the context of a prospective, non-randomised pilot trial. Up to the moment 19 patients have been treated with laser ablation under ultrasound guidance.

The main objective of our study is to assess the safety and effectiveness of a modified laser ablation technique for benign thyroid nodules and to evaluate the total cost of treatment compared to surgery and others ablative techniques.

We report our preliminary experience in using our new developed **light and flight technique** for laser ablation that consist of multiple intranodular repositioning of the active tip of the optic fiber, with sequential overlapping laser illuminations using a single active optic fiber in a single session treatment.

Materials and Methods

In our prospective, non-randomised pilot trial will be included 90 patients who have thyroid nodules with benign cytology, with a single thyroid nodule or a multinodular goitre with a dominant nodule requiring permanent treatment due to the size, function, compressive

symptoms, or those who cannot be operated for medical reasons, or who refuse surgery. A number of 30 patients will be treated with new developed light and flight technique (LFT) for Laser Ablation (LA).

The medical ethical committee approval was obtained for this study and written informed consent of

patients was obtained. Patients were selected by a multidisciplinary group of endocrinologists and radiologists.

The inclusion criteria were: i) Patients who have compressive symptoms, nodules sized > 4 cm, or which cause a reduction in the tracheal and/or esophageal lumen, will undergo surgical treatment (i1, n = 10). In the event of contraindications to surgery or refusal by patient, the laser ablation treatment will be proposed (i2, n = 10) versus follow-up (i3, n = 10). ii) Patients with nodules that measure between 2.5 and 4 cm that are symptomatic or with prolonged subclinical hyperthyroidism that do not cause any reduction in the tracheal or esophageal lumen. Surgical treatment will be proposed (ii1 = 20) versus laser ablation (ii2, n = 20) versus follow-up (ii3, n = 20). Participants assigned to the Percutaneous Laser Ablation (PLA) groups (i2, ii2) will be treated in an ultrasound-guided session

Up to the moment we treated 19 patients (4 males, 15 females, 40-88 ys) with a benign symptomatic single or dominant thyroid nodules, with a 14-37 ml volume and solid (N= 10) or microquistic (N= 9) echostructure.

For the procedures we used a continuous-wave Nd-YAG laser operating at 1.064 nm (EchoLaser X4©, Esaote, Genoa, Italy).

Before of the procedure anticoagulant or antiplatelet therapy is discontinued according to the protocols and specific guidelines. On the day of the intervention 5 mg of diazepam are administered vo. The procedure is performed

Right thyroid lobe: axial view at the inferior pole of the nodule

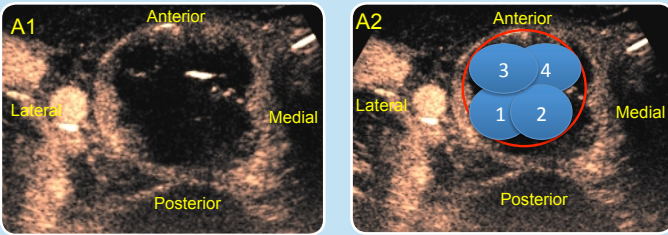


Image A1: contrast-enhanced axial view of the inferior pole of the right thyroid lobe. **Image A2:** numbers indicate the sequence of the illuminations in the inferior pole of the nodule in the axial plane. Blu spots indicate the ablated area at each illumination. At each illumination 600 joules are delivered at each blu spot. The red circle indicates the global ablated area at the end of the procedure.

The procedure begins at the inferior, posterior and lateral side of the nodule: illumination 1 = number 1.

The needle is moved medially to the inferior, medial and posterior part of the nodule: illumination 2 = number 2.

The needle is then directed laterally and anteriorly in the anterior-inferior pole of the nodule: illumination 3 = number 3.

The needle is then directed medially in the anterior-inferior pole of the nodule: illumination 4 = number 4.

under local anesthesia (2% lidocaine at the point of the puncture) and conscious sedation with intravenous propofol and a bolus of fentanyl and ketamine. For ultrasound guidance we used a Mylab70 (Esaote, Genova, Italy) with a 13 MHz linear transducer.

LFT-LA treatment is performed with the patient lying in supine position and the neck hyperextended, by introducing one 21 gauge guiding needle along the cranio-caudal diameter of the thyroid nodule. Under ultrasound guidance the tip of the needle is positioned in the most posterior, lateral and inferior part of the nodule. A 300 microns optic fiber is then inserted through the needle until the distal 5 to 7 mm of the fiber exit the tip of the needle and are in direct contact with the thyroid tissue. Laser illuminations are performed through a power source of 3 W.

LFT consists of multiple overlapping low and intermediate energy laser illuminations using a single active optic fiber that is sequentially moved in the nodule. At the end of each illumination the active tip of the optic fiber is repositioned using the free hand technique and a new illumination is performed in the part of the nodule adjacent to the previously treated area thus permitting the overlapping of the ablated regions. The total number of intranodular repositioning of the active tip and subsequent illuminations depend on the volume of the nodule. The LFT-LA technique allows to spread laser light in the complete volume of the nodule thus permitting to use reduced energy laser illuminations. To realize this modified laser ablation technique in a safety manner the peripheral 10 mm of the nodule or the parts of the nodule adjacent to the trachea and the danger triangle are treated by low energy illuminations (up to 300 Joule), while the central part of the nodule is treated with higher energy illuminations (between 500 and 800 Joule).

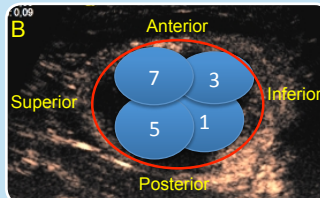
To plan the LFT-LA the nodule is ideally divided in multiple virtual areas. To better understand the sequences of the LFT

procedure these virtual areas are identified adapting the normal anatomic nomenclature to ultrasound views. With the patient in the supine position we therefore ideally divide the nodule in a medial (paratracheal), lateral (juxtacarotid) and intermediate part in the sagittal plane. In the coronal plane we divide the nodule in a posterior (prevertebral), anterior (adjacent to the sternocleidomastoid muscle and subcutaneous tissue) and a central part. In the axial plane the nodule is divided in an inferior (caudal), intermediate and superior (cranial) part.

As a general rule, to avoid posterior shadowing from gas formation during the procedure, laser illuminations are directed from inferior to superior in the axial plane, from lateral to medial in the sagittal plane, and from posterior to anterior and in the coronal plane.

We usually start the procedure at the most posterior and inferior part of the lateral side of the nodule. We then move the tip of the needle medially in the sagittal plane to treat the most inferior and posterior part of the intermediate part of the nodule. We then consecutively and repetitively move the needle superiorly in the axial plane and anteriorly in the coronal plane from lateral to medial in the sagittal plane covering all the volume of the nodule. Starting the treatment at the lateral side of the nodule permit to reduce the risk of lesioning the medially located trachea and neurovascular bundle. Usually the medial part of the nodule is treated with a new needle insertion and illuminations are started from the most inferior, posterior and medial part of the nodule.

Right thyroid lobe: Sagittal view at the lateral side of the nodule



Right thyroid lobe Sagittal view at the medial side of the nodule

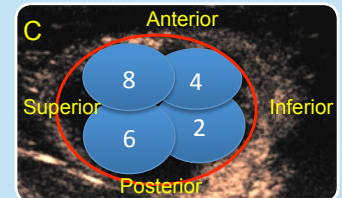


Image B and C: show the sequence of the illuminations in the lateral (B) and medial (C) side of the nodule in the sagittal plane.

Blu spots indicate the ablated area at each illumination. During each illumination 600 joules are delivered at 3 Watts. The red circle indicates the global ablated area at the end of the procedure. At the end of the procedures a total amount of 4800 joules were delivered.

The procedure begins at the inferior, posterior and lateral side of the nodule: illumination 1 (number 1, image B).

The needle is moved medially to the inferior, medial and posterior part of the nodule: illumination 2 (number 2, image C).

The needle is then directed laterally and anteriorly in the anterior-inferior pole of the nodule: illumination 3 (number 3, image B).

The needle is then directed medially in the anterior-inferior pole of the nodule: illumination 4 (number 4, image C).

The needle is then moved superiorly and laterally to the superior, lateral and posterior part of the nodule: illumination 5 (number 5, image B).

The needle is then directed medially and posteriorly in the posterior superior pole of the nodule: illumination 6 (number 6, image C).

The needle is then directed laterally and anteriorly in the anterior-superior pole of the nodule: illumination 7 (number 7, image B).

The needle is then directed medially in the anterior-superior pole of the nodule: illumination 8 (number 8, image C).

The tip of the needle is subsequently moved superiorly and anteriorly in the medial part of the nodule. A distance of at least 10 mm is always maintained between the tip of the needle and the thyroid capsule. In large nodules it may be necessary to realize multiple consecutive re-insertions of the guiding needle to cover the complete volume of the nodule while maintaining a safety orientation of the active tip of the optic fiber with respect to the cervical perithyroid structures. Performing multiple reinsertion of the single active optic fiber permit to avoid direct firing toward the common carotid artery, the trachea or the recurrent laryngeal nerve branches. These multiple re-insertions due to the small diameter of the 21 G needle do not cause any permanent skin lesion, are well tolerated by the patient. In our experience the presence of two operators, usually an endocrinologist and a radiologist permit the constant control of both the ultrasound and laser equipment allowing a tailored procedure for each patient with a precise energy administration respecting the safety margins of treated nodule and allow the operators to have a fulltime control of the relation of the active tip of the needle with relevant cervical structures.

A dose of 0.5 mg / kg iv methylprednisolone is administered, at the beginning of the procedure, and 40 mg pantoprazole are administered iv to prevent obstruction of the airway by edema.

Prophylaxis of nausea and vomiting is realized by iv administration of 4 mg of ondansetron and analgesia is complemented with paracetamol 1g iv.

After the procedure corticosteroids are given in a short downward pattern of 8 days. (Prednisone 15 mg / day for one day followed by a rapid 5 days descending doses) and analgesics (Paracetamol PO. 1g / 8h vs Ketorolac 30 mg po.) if pain persists.

To assess the volume of the ablated area (volume of coagulation obtained with ALP) B-mode ultrasound, color Doppler and contrast enhanced ultrasound evaluation) is performed immediately after the procedure.

Clinical and ultrasound follow-up was performed at one week, one, 3, 6 and 12 months after the procedure to evaluate volume reduction and exclude treatment related complications.

Results

The mean procedure time for LFT-AL was 40. No major complications occurred.

The mean volume reduction for LFT-LA was 30-40% at 1 month and 50-70 % at 6 months.

When comparing the volume reduction associated to the internal consistency of the nodules, the solid nodules presented a 65-78% overall volume reduction at 6 months compared to a 40-60% for microcystic-spongiform nodules.

Nodules with volume > 24 ml (> 4.5 cm in diam. max) presented a lower reduction in size at 1, 3, 6 months: of 40-56%

The 12-month follow-up is ongoing.

All patients have remained asymptomatic at 1, 3, 6 and 12 months post LFT-AL and no patient was referred to surgery due to procedure related complication or nodule re- growth.

During follow-up, thyroid function remained normal in all patients and in 3 patients with subclinical hyperthyroidism thyroid function it has been normalized to 6 months post LFT-LA.

Conclusions

In our initial experience the LFT- LA appears to be a safe and effective procedure in the treatment of benign thyroid nodules. Volume reduction seems to be more rapid being significant already at 1 month as regarding the conventional LA. Similar results of those reported with conventional LA technique in terms of volume reduction were registered at 6 and 12 months.

More over LFT-LA for benign thyroid nodules is a cost effective and easily reproducible procedure since only one active fiber is used in each treatment. Like others ablative techniques such RF repeated LFT- LA should be considered for large volume nodules, with the advantage of the lower cost of the LFT- LA when compared to cooled-RF.

Finally we consider that in the future LFT could be easily applicable to cooled laser device for very large volume thyroid nodules.

References

1. RS Bahn, M R Castro. Approach to the patient with nontoxic multinodular goiter. *Journal of Endocrinology and Metabolism*, 2011, pg 1202-1212.
2. S Melmed, K Polonsky, PR Larsen, HR Kronenberg, Williams Textbook of Endocrinology, 12th Edition, Section III, Thyroid, page327-361.
3. E Papini, R Guglielmi, G Bizzarri, F Graziano, A. Bianchini, C Brufani, S Pacella, D Valle, CM Pacella. Treatment of benign cold thyroid nodules: a randomized clinical trial of percutaneous laser ablation versus levothyroxine therapy or followup. *Thyroid*, 2007, pg 229-35.
4. R Valacalvi, F Rigatini, A Bertani, D Formisano, CM Pacella. Percutaneous laser ablation of cold benign thyroid nodules: a 3 year follow-up study. *Thyroid*, 2010, pg 1253-61.
5. JHBAek, YS, Kim, D Lee, JY Huh, JH Lee Paril. Predominantly Solid Thyroid Nodules: Prospective Study of Efficacy of Sonographically Guided Radiofrequency. Ablation versus Control Condition. *Vascular and Interventional Radiology*, 2010, pg 1137-1142.
6. H Dossing, FN Bennedbaek, L Hegedues. Effect of ultrasound-guided interstitial laser photocoagulation on benign solitary solid cold thyroid nodules- a randomised study. *European Journal of Endocrinology*, 2005, pg 341-345.
7. H. Dossing, FN Bennedbaek, L Hegedues. Long-term outcome following interstitial laser photocoagulation of benign cold thyroid nodules. *European Journal of Endocrinology*, 2011, pg 123-128

13th edition of the Annual Middle East Otolaryngology Conference and Exhibition / The 1st Middle East Thyroid Cancer Conference



As our strong believe in supporting the medical field and the health system around the world, Elesta in association with ARAMED the official partner in MENA region participated in The 13th edition of the Annual Middle East Otolaryngology Conference and Exhibition Head and neck Surgery / The 1st Middle East Thyroid Cancer Conference that took place from the 19th to the 21th of April at the Madinat Arena, Dubai, UAE. Our participation was by introducing the EchoLaser to the medical field as one of the effective options as a Minimally invasive treatment for the patients suffering from Thyroid nodules. The conference welcomes 1800 healthcare providers in the field of ENT, Head & Neck Specialists, Otolaryngology, Endocrinology and others from 16 different parts of the Middle East, Northern Africa and the world. Among the conference 3 days attendees discussed the latest updates and medical findings in the fields of Rhinology, Cochlear Implants,

Head & Neck, Rhinoplasty, Otology and Audiology and Thyroid Cancer conducted by 237 speakers from different parts of the world. The 1st Middle East Thyroid Cancer Conference was supported by a group of international associations including:

- Asian-pacific society of Thyroid Surgery
- American Head and Neck Surgery
- American Association of Clinical Endocrinologist – Italian Chapter

And have been managed and organized by the following Chairmen:

- Dr Carmelo Barbaccia, ENT, Consultant Head and Neck Suregon, American Hospital, Dubai, UAE
- Dr Donatella Casiglia, MD Endocrinologist, American Hospital, Dubai, UAE
- Dr Muaaz Tarabichi, MD FACS, Head of ENT Department, American Hospital, American Hospital Dubai, UAE



The conference invited a group of well-recognized speakers inspiring the event attendees with some of the world most renowned experts in the field of Endocrinology and Thyroid Cancer who shared their experiences and exchanging ideas on the latest international guidelines, new genetic markers, the continuous evolving of new technologies to the new concept of target therapy and a vision on the future treatment.

List of speakers presented in the conference includes:

- Aaron Han, MD, PhD, FCA, Director of Pathology, America Hospital Dubai, UAE
- Ahmet İkiz, MD, MSc, Professor, Dokuz Eylul University, Faculty of Medicine, Department of E.N.T. and Head & Neck Surgery, Izmir, Turkey
- Cesare Piazza, Assistant Professor, Otolaryngologist Department, University School of Medicine, Brescia, Italy
- David Chhieng, MD, MBA, MSHI, MSEM, MA, Professor, Director of Cytology & Outreach Service, Department of Pathology, Yale University School of Medicine, New Haven, USA
- Elvio De Fiori, Deputy Director, Division of Radiology, European Institute of Oncology, Milano, Italy
- Enrico Papini, Director, Endocrinology department, Regina Apostolorum Hospital, Rome, Italy

- Furio Pacini, Professor, Chief of Endocrinology and Metabolism Department, University of Siena, President, European Thyroid Association, Italy
- Hitoshi Noguchi, Endocrinologist, Noguchi Thyroid Clinic
- Gioacchino Giugliano, Director, Unit of Thyroid and Salivary Neoplasia, European Institute of Oncology, Milano, Italy
- Giuseppe Spriano, Professor, Director of Neuroscience Department, Director of Otolaryngology and Head & Neck Surgery Department, Regina Elena, National Cancer Institute, Roma, Italy
- Kyung Tae, President, Korean Society of Otorhinolaryngology-Head and Neck Surgery, Professor, Department of Otolaryngology- Head and Neck Surgery, College of Medicine, Hanyang University, Korea
- Paolo Miccoli, Professor, Director of Surgical Department, University School of Medicine, Pisa, Italy
- Weige Yang, M.D., Ph.D., Department of General Surgery, Director, Fudan University, Medical Center for Thyroid Disease, Director, Zhongshan Hospital, Medical Center for Breast Disease, Shanghai, China.
- Yogesh More, MD FACS, Consultant Surgeon, SKMC, Abu Dhabi, UAE

After the conference concluded its agenda and sessions, the American Hospital in Dubai brought the conference attendees to A Thyroid Ultrasound and Ultrasound FNA workshop under the umbrella of The 1st Middle East Thyroid Cancer Conference chairmen and faculty. The aim of this workshop was to have a comprehensive training concerning the ultrasound and FNA techniques, investigation and analysis of thyroid nodules / color flow and power Doppler / ultrasound in the surveillance of thyroid cancer and neck lymph nodes / parathyroid ultrasound / ultrasound guided FNA biopsy and Minimally invasive therapy for benign and malignant nodules.

Saeed Bali B.Sc.Ph
Business Unit Manager – MENA
ARAMED

Treatment of Papillary Thyroid Microcarcinoma by Ultrasound-guided Percutaneous Laser Ablation

ZHAN Weiwei, YE Tingjun, CAO Yi, ZHU Ying, HU Yunyun, YAO Jiejie. Department of Ultrasound, Ruijin Hospital, Shanghai Jiaotong University School of Medicine, Shanghai 200025, China

Journal of Surgery Concepts & Practice, 2014: Vol. 19, No. 2

Abstract

Objective

To evaluate the feasibility, safety and efficacy of ultrasound-guided percutaneous laser ablation (PLA) for the treatment of papillary thyroid microcarcinoma (PTMC).

Methods

Three patients with single PTMC diagnosed by fine-needle aspiration cytology underwent ultrasound-guided PLA. After treatment, the size and blood flow signals of the lesions were evaluated with conventional ultrasonography, and the ablation extent of the lesions were assessed by contrast enhanced ultrasonography (CEUS) immediately and 3 days after PLA. Ultrasound-guided fine-needle aspiration biopsy was performed at 30 days after PLA.

Results

All of the 3 patients successfully completed PLA under local anesthesia. The procedure was well tolerated without complications, and the patients required no analgesics. Instead of the lesion observed before PLA, conventional ultrasonography showed a broad heterogeneous area devoid of vascular signals after PLA. CEUS at once and 3 days after PLA confirmed that the completely avascular area fully encompassed the treated lesion. Ultrasound-guided fine-needle aspiration biopsy at 30 days after PLA demonstrated necrotic tissues and inflammatory cells without viable neoplastic cell.

Conclusions

Ultrasound-guided PLA is a safe, effective, and feasible procedure for the treatment of papillary thyroid microcarcinoma.

Great success for the International School of Thyroid Ultrasonography and Ultrasound-Assisted Procedures Advanced Course

Sold out and great success is reached for the next **Advanced Course** of the **International School of Thyroid Ultrasonography and Ultrasound-Assisted Procedures, "Focus on US-guided diagnostic procedures and laser treatment of thyroid lesions"** that will take place on the 17th and 18th of September in Albano Laziale (Rome, Italy) at the Department of Endocrinology and Metabolism, and Department of Diagnostic Imaging and Interventional Radiology of the Ospedale Regina Apostolorum.

Attending this live educational course, learners will have up-to-date knowledge on thyroid ultrasonography and on its novel applications such as laser treatment for benign nodule, thus being able to:

- Recognize US patterns of thyroid nodules suggestive of malignancy
- Refine the execution methods for fine needle aspiration biopsy on thyroid nodules
- Apply novel alternative interventional approaches to treat benign thyroid nodules and selected thyroid malignancies.

Scientific Organisers are:

- Dr. Giancarlo Bizzarri, Chief of Department of Diagnostic Imaging and Interventional Radiology, Ospedale Regina Apostolorum; and
- Prof. Enrico Papini, Chief of Department of Endocrinology and Metabolism, Ospedale Regina Apostolorum, Albano Laziale Rome), Italy

Reservation for the 2016 course are already underway.

Echolaser news are available at
<http://www.elesta-echolaser.com/en/rassegna-stampa/>

Echolaser Club'contacts

Tel +39 055 8826807 – Fax +39 055 7766698
e-mail info@elesta-echolaser.com

ModiLite

<http://modilite.info>

Esaote S.p.A.

International Activities:
Via di Caciolle 15 50127 Florence, Italy
Tel. +39 055 4229 1 Fax +39 055 4229 208
www.esaote.com



Elesta s.r.l.

Via Baldanzese 17 50041 Calenzano, Italy
Tel. +39 055 8826807 Fax +39 055 7766698
www.elesta-echolaser.com

Echolaser News and any files transmitted with it are confidential. The EchoLaser members are authorized to view and make a single copy of parts of its content for offline, personal, non-commercial use. The content may not be sold, reproduced, or distributed without our written permission. Any third-party trademarks, service marks and logos are the property of their respective owners. Any further rights not specifically granted herein are reserved.