

# TRANSPUPILLARY THERMOTHERAPY FOR SMALL CHOROIDAL MELANOMA (a four years experience).

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## Abstract

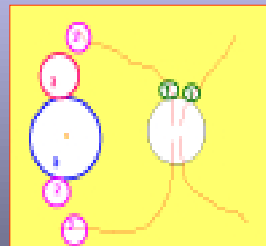
16 posteriors choroidal melanomas were treated with Transpupillary Thermotherapy (TTT), between June 1997 and March 2001 at the University Eye Clinic of the Croix - Rousse Hospital in Lyon. The infra-red diode Laser at 810 nm was used. All patients had a peribulbar anaesthesia. For each spot, the duration was 1 minute, the diaphragm 2 or 3 mm, according to instrumentations, the number of spots 4 to 80, the number of sessions 1 to 3, the average intensity 895 mW. At the last control the final mean thickness was 2.4 mm (initial mean thickness = 3.3 mm) and the final mean diameter was 6 mm (initial mean diameter = 7.1 mm). We obtained a stable regression of tumor volume in 13 cases (81%) with disappearance of the subretinal fluid. Hyperthermia proves its effectiveness in the small posteriors melanomas (initial thickness lower or equal with 4 mm). The greatest attention must be carried however to the treatment of the tumor's edges with a security fringe of at least 1.5 mm. In addition, the destruction of the intrascleral neoplastic pigmented cells by TTT is still discussed by certain authors.



Iridis Quantel Medical Laser Diode (France)

## Introduction

Transpupillary Thermotherapy is a method of delivering heat through the dilated pupil into the posterior segment of the eye. This method, using infrared radiation as the heat source, has been proposed to treat retinoblastomas and choroidal melanomas. TTT was initially employed as a supplement to plaque radiotherapy (as an adjunctive treatment by sensitising cells to radiotherapy) and as a primary treatment for posterior choroidal melanoma less than 4 mm in thickness (by devitalizing cells through a direct cytotoxic effect). The cytotoxic effect is generally achieved with more intense treatment at a higher temperature, whereas the sensitising effect is found with a lower temperature.



MELANOMAS LOCALIZATIONS

## Patients

Between June 1997 and March 2001 we treated 16 patients with choroidal melanoma using TTT as the only treatment. There were 7 men and 9 women. The mean patient age was 59 years (range, 29 to 81 years). There was a mean of 11 months follow-up (range, 4 to 36 months). The tumor localizations were : macular in 5 cases, juxta-macular sup in 3 cases, juxta-macular inf in 2 cases, juxta-papillary temp sup in 1 case, juxta-papillary nasal sup in 1 case on the vascular temporal sup arc in 2 cases. A secondary retinal detachment was present in 12 cases (75%) (inferior or/and peritumoral). The mean tumor thickness was 3.3 mm (range, 2.4 to 4 mm) and the mean tumor diameter was 7.1 mm (range 4 to 12.5 mm).

## Method

The infrared diode laser at 810 nm was used : Iris Medical Oculight SLX (spot diameter 3 mm) and Iridis Quantel Medical (spot diameter 2 mm).

All patients were treated under peribulbar anaesthesia, in lying position + operating microscope (for Laser Quantel), or in sitting position + Slit lamp (for Laser Oculight). The mean power was 895 mW (range, 600 to 2300 mW); the average number of spots was 26 (4 to 80) and the duration of the spots was 1 mn. The number of sessions of TTT was 1 for 13 patients, 2 for 2 patients and 3 for 1 patient; we tried to obtain a bleaching from the 30<sup>th</sup> second. The same surgeon was responsible for all treatments.



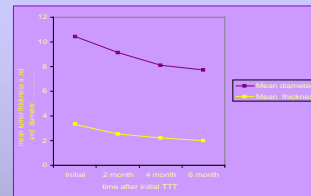
Iris Medical Oculight SLX Laser Diode (USA)

## Results

### Anatomic results

At the 4<sup>th</sup> month (14/16 cases), the mean thickness reduction was 1.1 mm (33%) and the mean diameter reduction was 1.2 mm (17%). At the last control (16/16 cases), the final mean thickness was 2.4 mm (initial mean thickness 3.3 mm) and the final mean diameter was 6 mm (initial mean diameter 7.1 mm). The stable regression of tumor volume was obtained in 13 cases (18%), with the disappearance of the subretinal fluid. We noted a complication (retinal traction healed with surgery) and 3 failures : 1 enucleation 12 months after the 3<sup>rd</sup> TTT and 1 adjuvant protontherapy after the 2<sup>nd</sup> TTT in two cases.

### ANATOMIC RESULTS



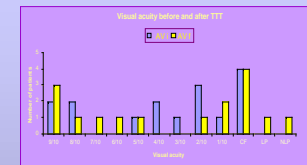
Transpupillary Thermotherapy for 16 choroidal melanomas  
Responses over a 6 months period  
(mean tumor thicknesses and diameters)

### Functional results

The comparison of VA after TTT and before TTT showed :

- a stabilization or an improvement of VA after TTT in 9 cases
- a deterioration of VA after TTT in 6 cases (3 macular tumors, 1 juxtapapillary tumor and 2 juxtamacular tumors
- one enucleation has been performed.

### FUNCTIONAL RESULTS



### FUNCTIONAL RESULTS comparison of VA post TTT versus VA before TTT according to the tumor localization

Macular	Idem	→	→	→
Juxta mac sup	→	→	→	→
Juxta mac inf	Idem	Idem	→	→
Juxta pap temp sup	→	→	→	→
Juxta pap nasal sup	→	→	→	→
Temp sup	→	Idem	→	→
Temp inf	Idem	→	→	→

## Conclusions 1

- The TTT showed a good efficiency in Retinoblastoma treatment.
- For Choroidal Melanomas it is limited to small posterior tumors.
- It is still partially experimental; there remains some problems :

The danger of non destruction of the intrascleral tumor cells the risk of the insufficiency of the treatment of the tumor edges the metastatic effect ?

## Conclusions 2

The efficiency of the technique is showed by some positive aspects :

- faster regression of tumor's volume after TTT/Radiotherapy
- absence of radiogenic complications
- low rate of non tumor control (5 to 20%)
- notable rate of stabilization - improvement of VA
- simplicity and economy.

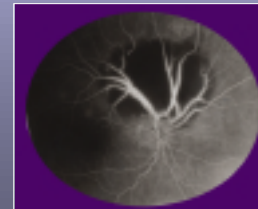


Fig 1: Juxta papillary melanoma (immediately after TTT) June 1999

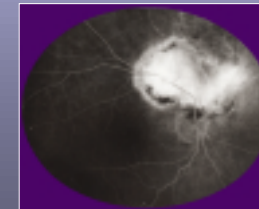


Fig 2: Same patient than fig 1 February 2001