Assessment of utility of flexible hand-held 2-µ thulium and CO2 lasers in surgical removal of intracranial meningiomas and schwannomas.

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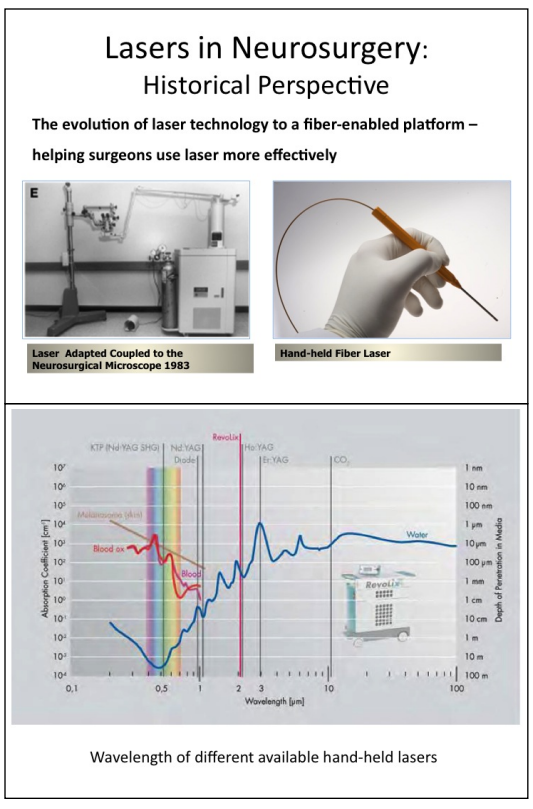
Learning Objectives

Utility of hand-held lasers in surgical removal of intracranial meningioma and schwannomas

Introduction

Since 1960, lasers have been used for surgical removal of intracranial tumors. Because of limited penetration through tissues and of wavelength, lasers are attractive for application during microsurgical removal of meningiomas and schwannomas. The aim of this study is to evaluate the usefulness of 2-µ-thulium and CO2 lasers.



Wavelength of different available hand-held lasers

Methods

From July 2010 to July 2014, **81 patients** with a diagnosis of intracranial ***meningioma* (57)** or ***schwannoma* (34)** were operated on in our Department using a hand-held laser. In 68, the tumor involved the skull base.

In 51 cases **CO2** and in 40 **2-µ-thulium** lasers have been used together with bipolar forceps (BF), ultrasonic aspirator (UA), and microsurgical instruments.
Excision of tumors consisted of four phases:
1) devascularization;
2) debulking;
3) dissection from deep structures;
4) detachment and removal from base of implant.
During these steps, we evaluated the percentage of use of laser and the surgeon satisfaction rate (scale: 0-3).

Surgeon satisfaction rate	*Usefulness of Hand-Held Laser*
0	No Useful
1	Moderately Useful
2	Useful
3	Very useful

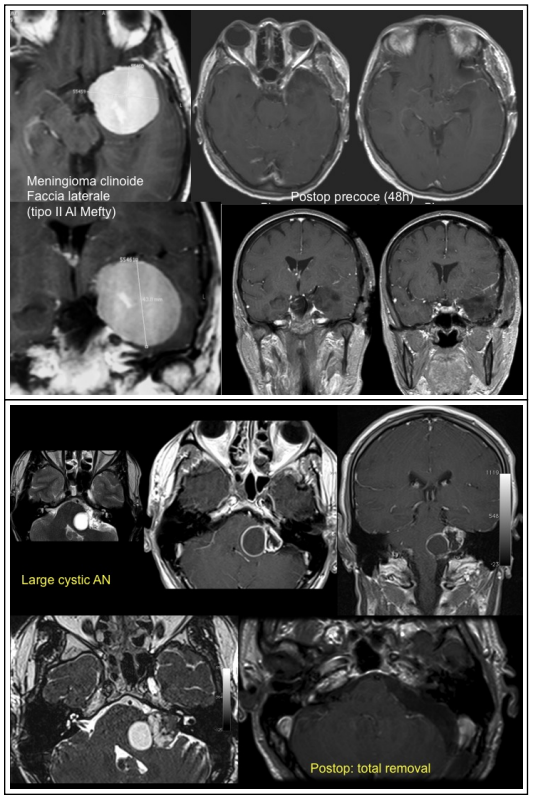
Mean overall score: 2,8

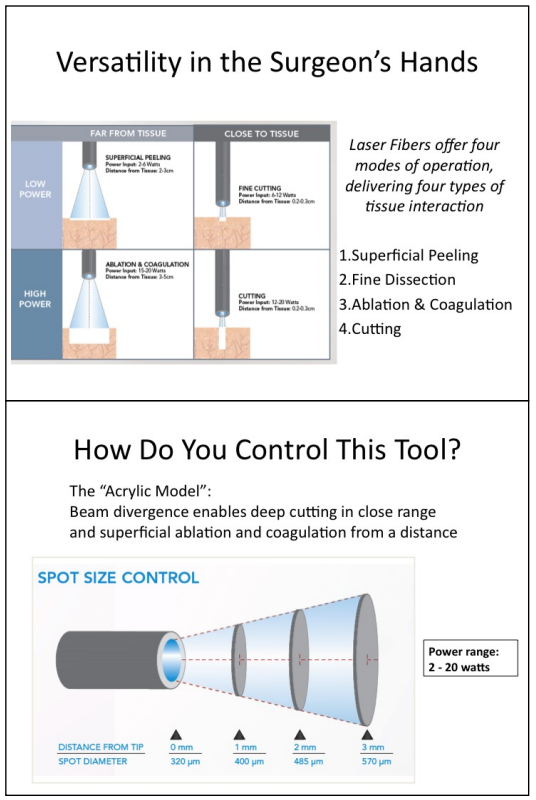
Mean value for Neuromas: 2,63
Mean value for Meningiomas: 2.90

Results

Both lasers were used during phases 2 (with UA and BF) and 4 (together with BF), 60% and 30%, respectively.
Thulium laser was also used for **devascularizarion** of external surface of tumor. Traditional dissection with scissors and microdissectors was preferred for phase 3.
Surgeon satisfaction rate was 2,86 for CO2 and 2,70 for thulium laser, respectively (p>0,05).

Mean score for CO2 laser was 2,64 infor Neuromas and 2,93 for Meningiomas
Mean score for thulium laser was 2,62 for Neuromas and 2,83 for Meningiomas





Conclusions

Thulium and CO2 lasers seem to be useful in the surgery of intracranial meningiomas and schwannomas, especially for debulking and shrinking the mass, and for coagulating the mass and the basal implant.

Thulium laser seems to be more indicated in bleeding tumors and CO2 in hard tumors.