Clinical Bulletin 1/09

Dr. Dovšak is a specialist surgeon in maxillofacial surgery. He is the founder of the AMOK surgery and dentistry clinic, and an Expert Clinical Lecturer for the Laser and Health Academy. Dr. Dovšak has been using a variety of Fotona dental laser systems in his practice for over a decade.

Lingual Frenectomy Using Er:YAG – A Case Study

Dr. David Dovšak, M.D., Specialist Surgeon in Maxillofacial Surgery

Ankyloglossia is a congenital anomaly that limits the mobility of the tip of the tongue. In cases were feeding, speech and oral hygiene are affected a frenectomy may be considered, especially when the development of an open bite deformity and mandibular prognathism are likely. Conventional frenectomy techniques would include the use of a scalpel, radio-frequency device or scissors, which often requires at least one stitch and leads to some degree of post-operative discomfort as well as the need for a return visit to remove the stitch(es). The main advantages of using the Er:YAG laser with the below recommended settings are that there is no bleeding and stitching is not required, minimizing post-operative discomfort for the patient, and reducing procedure time for the practitioner.

In this case the patient was referred by the pediatrician and presented with speech problems. We placed cotton pads under the patient's tongue for approximately 30 seconds before administering normal local anesthesia. Securely holding the superior part of the frenulum with forceps, the Er:YAG laser treatment was administered from the superior part of the frenulum downwards, using the settings provided in the table below. The procedure was concluded in a matter of seconds; the first number of laser shots was administered approximately in the same location to initiate the separation of the frenulum from the tongue. The following sequence of laser shots in quick succession along the frenulum to provide a clean incision.

Laser source:	Er:YAG (2940 nm)
VSP Mode:	LP
Pulse energy:	550 mJ
Frequency:	6 – 10 Hz
Handpiece:	R14
Water/Air Spray Setting:	None

No further post-operative care was required. The patient was released immediately with instructions to eat ice-creams. Licking ice cream provides discomfort relief and moving the tongue avoids scar formation. The main benefit of the Er:YAG lingual frenectomy for the patient is its simplicity, speed and minimal discomfort both during and post-operatively. It is an ideal treatment solution for young patients.

Before

Immediately after

Laser & Health ACADEMY

Clinical Bulletin 2/09

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Er:YAG Lingual Fibroma Removal – A Case Study

Dr. David Dovšak, M.D., Specialist Surgeon in Maxillofacial Surgery

In this case a patient presenting with several, localized lingual fibromae, was referred by the patient's dentist. The patient reported aesthetic concerns and general annoyance with repeatedly biting the lesion, causing discomfort. After conforming the lesion was benign, the decision was made to remove the lesion using Er:YAG laser. If there is any doubt that the lesion may not be benign it is paramount to have a biopsy checked out by a qualified laboratory. Conventional techniques would include the use of a scalpel or a radio-frequency device, which would have required stitching in this case. This would have lead to some degree of post-operative discomfort as well as the need for a return visit to remove the stitches. The procedure was performed under local anesthesia. Using the treatment parameters described below no bleeding occurred during the procedure. SP mode was used to ablate the fibroma to just above the adjacent tissue. Longer, LP mode pulses were used to continue ablation down to the level of the adjacent tissue. The thermal effect of the longer, LP mode pulses coagulate the smaller blood vessels in the surrounding area, eliminating bleeding. The ablative action of the Er:YAG laser, which removes tissue in micron-thin layers, contributes to higher levels of accuracy in planning the lesion. These levels of accuracy would be hard to achieve with more conventional in the 1-minut treatment time it took with the Er:YAG laser. In addition, the hemostasis provided by the laser reduces hematoma formation, thereby contributing to a more comfortable recovery. In that respect the use of the ER:YAG laser to remove lingual fibromae provides unique benefits and can be considered irreplaceable for such treatments in oral surgery.

Laser source:	Er:YAG (2940 nm)
VSP Mode:	SP and LP
Fluence:	5 – 9 J/cm^2
Frequency:	7 Hz
Handpiece:	R11*
Spotsize:	4 mm
Water/Air Spray Setting:	None

* available in AT Fidelis Aesthetic Upgrade package

No further post-operative care was required. The wound should heal without problems through the formation of new fibrin. The patient was released immediately after the procedure with instructions to use the tongue normally; moving the tongue avoids scar formation. The main benefit of the ER:YAG lingual fibroma removal procedure for the patient is its simplicity, speed and minimal discomfort both during and post-operatively. It is an ideal solution for young patients.

Before

Immediately after

Laser&Health ACADEMY

Clinical Bulletin 3/09

Venous Malformation Treatment Using Nd:YAG – A Case Study

Dr. David Dovšak, M.D., Specialist Surgeon in Maxillofacial Surgery

This case describes the treatment of a young patient, referred by the patient's dentist, for fear of the venous malformation being accidentally bitten, initiating excessive bleeding. Conventional therapies include chemical sclerotherapy, which requires radiological control to ensure complete and accurate treatment. With sclerotherapy the risk of enlarging the lesion is present, if not all vascular structures are sclerotized. Other alternative treatments are excision, cryotherapy and electro-cauterization, which poses a risk of inducing excessive bleeding if the lesion is penetrated into.

The Nd:YAG laser's unhindered penetration deep into the tissue and its good absorption in hemoglobin led the decision to use the modality to treat this case. When treating young children it is advisable to do so under general anesthesia; placing local anesthesia deep in the oral cavity can be a problem in young patients. In adults a general rule is to use local anesthesia in the distal 2/3 part of the tongue, general anesthesia when treating the oropharyngeal part of the tongue. During the treatment, the fiber tip is held in near contact with the tissue surface. The borders of the lesion are first outlined with the laser and afterwards systematical passes covering the whole lesion are made. Immediate shrinking and blanching of the mucosa will be observed. The power of the Nd:YAG laser can be controlled to a certain degree by varying the distance between the fiber tip and the mucosa. It is recommended to hold the fiber tip slightly further from the target when initiating the treatment and closing in on the target during the treatment, once the effect of the laser parameter settings has been visually confirmed. The procedure in this case was completed within 5 minutes, without any excessive bleeding or swelling.

Laser source:	Nd:YAG (1064 nm)
VSP Mode:	SP
Power:	10 W
Frequency:	50 Hz
Handpiece:	R21 with 300 µm fiber
Water/Air Spray Setting:	None

No further post-operative care was required. The patient was released immediately after the procedure and given non-steroid analgetics to ease discomfort during meals. Tissue sloughs off during the first few days and the wound will be covered with newly formed fibrin tissue. Re-epithelization starts from the wound margins and is complete within 2 to 4 weeks, depending on the size of the lesion.

Before

2 weeks after

3 months after

Dr. Dovšak is a specialist surgeon in maxillofacial surgery. He is the founder of the AMOK surgery and dentistry clinic, and an Expert Clinical Lecturer for the Laser and Health Academy.

Dr. Dovšak has been using a variety of Fotona dental laser systems in his practice for over a decade.

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Laser & Health ACADEMY

Clinical Bulletin 4/09

Venous and Lymphatic Malformation Treatment Using Nd:YAG – A Case Study

Dr. David Dovšak, M.D., Specialist Surgeon in Maxillofacial Surgery

A patient was referred by the patient's dentist, presenting a venous malformation with lymphatic aspects, for risk of excessive bleeding if the lesion would be accidentally bitten. The patient also expressed aesthetic concerns. Conventional therapies include chemical sclerotherapy, which requires radiological control to ensure complete and accurate treatment. With sclerotherapy the risk of enlarging the lesion is present, if not all vascular structures are sclerotized. Other alternative treatments are excision, cryotherapy and electro-cauterization, which poses a risk of inducing excessive bleeding if the lesion is penetrated into.

The Nd:YAG laser's unhindered penetration deep into the tissue, its good absorption in hemoglobin and the extent of the lesion, led the decision to use the modality to treat this case. In adults a general rule is to use local anesthesia in the distal 2/3 part of the tongue, general anesthesia when treating the oropharyngeal part of the tongue. Nevertheless we opted for general anesthesia because of the age of the patient, 14 years old. During the treatment, the fiber tip is held in near contact with the tissue surface. The borders of the lesion are first outlined with the laser and afterwards systematical passes covering the whole lesion are made. Immediate shrinking and blanching of the mucosa will be observed. The power of the Nd:YAG laser can be controlled to a certain degree by varying the distance between the fiber tip and the mucosa. It is recommended to hold the fiber tip slightly further from the target when initiating the treatment and closing in on the target during the treatment, once the effect of the laser parameter settings has been visually confirmed. In this case the procedure was completed within minutes, without any excessive bleeding or swelling.

Laser source:	Nd:YAG (1064 nm)
VSP Mode:	LP
Power:	8 – 10 W
Frequency:	50 Hz
Handpiece:	R21 with 300 µm fiber
Water/Air Spray Setting:	None

No further post-operative care was required. The patient was released immediately after the procedure and given non-steroid analgetics to ease discomfort during meals. Tissue sloughs off during the first few days, see *1 week after* below and the wound will be covered with newly formed fibrin tissue. Re-epithelization starts from the wound margins and is complete within 2 to 4 weeks, depending on the size of the lesion.

Before | During | 1 week after | 6 months after

Dr. Dovšak is a specialist surgeon in maxillofacial surgery. He is the founder of the AMOK surgery and dentistry clinic, and an Expert Clinical Lecturer for the Laser and Health Academy.

Dr. Dovšak has been using a variety of Fotona dental laser systems in his practice for over a decade.

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Clinical Bulletin 5/09

Fibroma Removal on the Nasal Labia Using Er:YAG – A Case Study

Dr. David Dovšak, M.D., Specialist Surgeon in Maxillofacial Surgery

Dr. Dovšak is a specialist surgeon in maxillofacial surgery. He is the founder of the AMOK surgery and dentistry clinic, and an Expert Clinical Lecturer for the Laser and Health Academy.

Dr. Dovšak has been using a variety of Fotona dental laser systems in his practice for over a decade.

The patient in this case presented directly at our surgery with a benign fibroma on the right nasal labia, which caused aesthetic concerns. The patient also expressed aesthetic concerns. Prior to having the luxury of an Er:YAG laser at hand, we would have removed the fibroma using the Limberg flap technique. This is a considerably time consuming procedure, requiring a follow up visit and the results of the procedure are not as predictable as the removal of the fibroma with the Er:YAG laser.

The procedure was conducted under local anesthesia without additional cooling during the treatment. SP mode, Er:YAG pulses were used to plane down the lesion to just above the level of the adjacent tissue. Longer pulsewidth, LP mode pulses were then used to continue ablation to the level of the adjacent tissue. The longer pulses of LP mode introduce a thermal element to the otherwise cold ablation, providing coagulation of the vessels in the center of the fibroma. The coagulation of the blood vessels will be seen as a small dark spot appears in the center of the planed-down lesion. The entire procedure was performed in approximately one minute.

Laser source:	Er:YAG (2940 nm)
VSP Mode:	SP and LP
Fluence:	8 J/cm^2
Frequency:	10 Hz (SP) and 5 Hz (LP)
Handpiece:	R11*
Water/Air Spray Setting:	None

* available in AT Fidelis Aesthetic Upgrade package

No further post-operative care was required. The patient was released immediately after the procedure and instructed to apply a hydrating cream over the scab until it releases.

Before

Immediately after

3 weeks after

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Laser & Health ACADEMY

Clinical Bulletin 6/09

Dr. Dovšak is a specialist surgeon in maxillofacial surgery. He is the founder of the AMOK surgery and dentistry clinic, and an Expert Clinical Lecturer for the Laser and Health Academy.

Dr. Dovšak has been using a variety of Fotona dental laser systems in his practice for over a decade.

Xanthelasma Treatment Using Er:YAG – A Case Study

Dr. David Dovšak, M.D., Specialist Surgeon in Maxillofacial Surgery

The patient had been referred to our maxillofacial surgery for an apiectomy procedure, which we successfully completed. The patient expressed some aesthetic concerns about the xanthelasmata. Her GP had provided blepharoplasty as the only treatment option. Given the invasiveness, down-time and expense of the procedure the patient had not considered aesthetic treatment any further. Having explained that no cutting and suturing is involved in the laser treatment the patient elected to have the xanthelasmata removed from both eyelids.

The procedure was conducted under local anesthesia without additional cooling during the treatment. Xanthelasmata are cholesterol deposits underneath the skin. SP mode, Er:YAG pulses were used to plane down the lesions until the deposits were completely removed. Longer pulsewidth, LP mode pulses were then used to continue ablation. The longer pulses of LP mode introduce a thermal element to the otherwise cold ablation, providing coagulation. The entire procedure was performed in approximately 10 minutes.

Laser source:	Er:YAG (2940 nm)
VSP Mode:	SP and LP
Fluence:	7.5 J/cm^2
Frequency:	5 Hz
Handpiece:	R11*
Spotsize:	4 mm
Water/Air Spray Setting:	None

* available in AT Fidelis Aesthetic Upgrade package

No further post-operative care was required. The patient was released immediately after the procedure and instructed to apply a hydrating cream over the scab until it releases. The main advantage for the patient was the significantly lower invasiveness compared to the provided alternative therapy. The elimination of cutting from the treatment and subsequent suturing improve post-operative comfort for the patient. Recovery after the removal of xanthelasmata using Er:YAG laser is generally faster than with conventional methods.

Before

1 week after

6 months after

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Laser & Health ACADEMY

Clinical Bulletin 9/09

Nd:YAG Treatment of Multiple Hemangiomae in the Oral Cavity – A Case Study

Assist. Aleš Vesnaver, M.D., M.S., Specialist Maxillofacial Surgeon

A 62-year old male presented with multiple, intra-oral hemangiomae located on the tongue, lips and cheeks. The patient reported loss of normal function with moderate to severe impairment during normal activity. The risk of accidentally biting any of the hemangiomae, leading to excessive bleeding, was determined to be high and imminent.

We therefore decided to treat immediately with the Fotona Nd:YAG laser because the procedure is fast, the treatment can be completed in one single session and it is minimally invasive with good long-term results. The laser's 1064nm wavelength allows it to penetrate deep into the tissue and the lesion, where its energy is absorbed by hemoglobin, creating virtually immediate coagulation and shrinking of the lesion. Alternative therapies include chemical sclerotherapy which requires radiological control, excision which is time-consuming, cryotherapy which is hard to control and electro-cauterization that poses a significant risk of excessive bleeding and procedural complications if the lesion in penetrated into.

The procedure was completed under general anesthesia with nasotracheal intubation. Each individual lesion was treated using the same procedural steps in which the lesions' borders were first outlined with the laser, with the fiber tip in near contact with the tissue surface. Then lesions were systematically covered with consecutive passes across their entire surface. Immediate shrinking and blanching of the mucosa was observed. Varying the distance between the fiber tip and the mucosa can to a certain degree alter and control the shrinking and blanching effect. When initiating the treatment the fiber tip is held slightly further from the target, once the clinical effects of the parameter settings have been confirmed visually, the target is closed in on with the fiber. This procedure was completed, without any complications, within 30 minutes. The patient was left intubated for 24 hours due to possible airway compromise because of post-operative oedema of the tongue. In such cases significant post-operative edema is to be expected lasting from the first 24 hours post-operatively to several days after the procedure.

Laser source:	Nd:YAG (1064 nm)
VSP Mode:	SP
Power:	12 W
Frequency:	50 Hz
Handpiece:	R21 with 300 µm fiber
Water/Air Spray Setting:	None

The patient was placed on a soft diet and oral non-steroidal analgesics for 7 days after the procedure, and spent three days in hospital care. Healing proceeded normally with re-epithelization starting from the wound margins. Complete wound healing and return to normal function was achieved within 5 weeks after the procedure.

Dr. Vesnaver is a specialist in maxillofacial surgery. He currently practices at the Department of Maxillofacial & Oral Surgery of the University Medical Center Ljubljana, where he is also an assistant professor.

He has been involved in the research and development of several oral laser surgical procedures including laser photo-coagulation of intra- and extra-oral vascular lesions and laser ablation of intra-oral leukoplakia.

Laser & Health ACADEMY

Clinical Bulletin 8/09

Large Venous Malformation Treatment Using Nd:YAG – A Case Study

Assist. Aleš Vesnaver, M.D., M.S., Specialist Maxillofacial Surgeon

A 42-year old male was referred to our department with a large venous malformation located on the right side of the lower lip and the oral vestibule. The patient's concerns were mainly aesthetic. From a medical viewpoint, the lesions could be accidentally bitten, initiating excessive bleeding.

We decided to treat the lesion with a Fotona Nd:YAG laser because the procedure is fast and minimally invasive with good long-term results. The Nd:YAG laser procedure puts the least amount of strain on the resources available to our busy surgical department. Furthermore, the laser's wavelength allows it to penetrate deep into the tissue and the lesion, where its energy is absorbed by hemoglobin. Alternative therapies include chemical sclerotherapy which requires radiological control, excision which is time-consuming, cryotherapy which is hard to control and electro-cauterization, which poses a significant risk of excessive bleeding and procedural complications if the lesion in penetrated into.

The procedure was completed under local anesthesia; bilateral mental nerve block with Ultracain. With the fiber tip in near contact with the tissue surface the lesion's borders was first outlined with the laser. The lesion was then systematically covered with consecutive passes across the entire lesion's surface. Immediate shrinking and blanching of the mucosa was observed. Varying the distance between the fiber tip and the mucosa can to a certain degree alter and control the shrinking and blanching effect. When initiating the treatment the fiber tip is held slightly further from the target, once the clinical effects of the parameter settings have been confirmed visually, the target is closed in on with the fiber. This procedure was completed, without any complications, within 10 minutes.

Laser source:	Nd:YAG (1064 nm)
VSP Mode:	SP
Power:	12 W
Frequency:	50 Hz
Handpiece:	R21 with 300 µm fiber
Water/Air Spray Setting:	None

The patient was placed on a soft diet and oral non-steroidal analgesics for 7 days after the procedure. The patient spent two days in hospital care. Healing proceeded normally with re-epithelization starting from the wound margins. Complete wound healing and return to normal function was achieved within 5 weeks after the procedure.

Before

Before

Immediately after

4 weeks after

7 weeks after

Complete recovery

Dr. Vesnaver is a specialist in maxillofacial surgery. He currently practices at the Department of Maxillofacial & Oral Surgery of the University Medical Center Ljubljana, where he is also an assistant professor.

He has been involved in the research and development of several oral laser surgical procedures including laser photo-coagulation of intra- and extra-oral vascular lesions and laser ablation of intra-oral leukoplakia.

Laser & Health ACADEMY

Clinical Bulletin

10/09

Nd:YAG Treatment of a Large Venous Malformation – A Case Study

Assist. Aleš Vesnaver, M.D., M.S., Specialist Maxillofacial Surgeon

A 48-year old female patient was referred to our department presenting a large venous malformation on the left side of the hard palate and another venous malformation on the upper lip. The patient's complaints were aesthetic and functional. There was also a risk present of accidentally biting the lesion on the upper lip, leading to excessive bleeding.

Because the patient was motivated to have both lesions treated in one session, we decided to treat with the Fotona Nd:YAG laser. The procedure is fast and minimally invasive with good long-term results. The laser's 1064nm wavelength allows it to penetrate deep into the tissue and the lesion, where its energy is absorbed by hemoglobin, creating virtually immediate coagulation and shrinking of the lesion. Alternative therapies include chemical sclerotherapy which requires radiological control, excision which is time-consuming, cryotherapy which is hard to control and electro-cauterization that poses a significant risk of excessive bleeding and procedural complications if the lesion in penetrated into.

The procedure was completed under general anesthesia with nasotracheal intubation. Each individual lesion was treated using the same procedural steps in which the lesions' borders were first outlined with the laser, with the fiber tip in near contact with the tissue surface. Then lesions were systematically covered with consecutive passes across their entire surface. Immediate shrinking and blanching of the mucosa was observed. Varying the distance between the fiber tip and the mucosa can to a certain degree alter and control the shrinking and blanching effect. When initiating the treatment the fiber tip is held slightly further from the target, once the clinical effects of the parameter settings have been confirmed visually, the target is closed in on with the fiber. This procedure was completed, without any complications, within 60 minutes. After the procedure the patient did not require further intubation as the risk of airway compromise was assessed as minimal.

Laser source:	Nd:YAG (1064 nm)
VSP Mode:	SP
Power:	12 W
Frequency:	50 Hz
Handpiece:	R21 with 300 µm fiber
Water/Air Spray Setting:	None

The patient was placed on a soft diet and oral non-steroidal analgesics for 7 days after the procedure. The patient eventually spent 4 weeks in hospital care due to a nasal hemorrhage unrelated to the Nd:YAG treatment. Healing proceeded normally with re-epithelization starting from the wound margins. Complete wound healing and return to normal function was achieved within 6 weeks after the procedure.

Before

Before

Immediately after

7 days after

4 weeks after

4 weeks after

Full recovery

Full recovery

Dr. Vesnaver is a specialist in maxillofacial surgery. He currently practices at the Department of Maxillofacial & Oral Surgery of the University Medical Center Ljubljana, where he is also an assistant professor.

He has been involved in the research and development of several oral laser surgical procedures including laser photo-coagulation of intra- and extra-oral vascular lesions and laser ablation of intra-oral leukoplakia.

Laser & Health ACADEMY

Clinical Bulletin

11/09

Treatment of a Large Lymphangioma with the Nd:YAG Laser – A Case Study

Assist. Aleš Vesnaver, M.D., M.S., Specialist Maxillofacial Surgeon

A 16-year old female patient was referred to our department with a large lymphangioma of the tongue dorsum, which caused functional and aesthetic complaints.

We decided to treat with the Fotona Nd:YAG laser because the procedure is fast and minimally invasive with good long-term results. Alternative therapies include chemical sclerotherapy which requires radiological control, excision which is time-consuming, cryotherapy which is hard to control and electro-cauterization that poses a significant risk of excessive bleeding and procedural complications if the lesion in penetrated into.

The complete treatment of the lesion required three Nd:YAG laser photo-coagulation sessions in total. Each procedure was conducted under local anesthesia with Ultracain. In each session we used a glass slide to compress the lesion to allow better penetration and access to the entire lesion. The lesion's borders were first outlined with the laser, with the fiber tip in near contact with the glass slide. Then the lesion was systematically covered with consecutive passes across their entire surface. Immediate shrinking and blanching of the mucosa was observed. Varying the distance between the fiber tip and the mucosa can to a certain degree alter and control the shrinking and blanching effect. When initiating the treatment the fiber tip is held slightly further from the target, once the clinical effects of the parameter settings have been confirmed visually, the target is closed in on with the fiber. Each treatment session was completed, without any complications, within 10 minutes. All the treatments were performed on an outpatient basis.

Laser source:	Nd:YAG (1064 nm)
VSP Mode:	SP
Power:	12 W
Frequency:	50 Hz
Handpiece:	R21 with 300 µm fiber
Water/Air Spray Setting:	None

The patient was placed on a soft diet and oral non-steroidal analgesics for 5 to 7 days after each procedure.. Healing proceeded normally after each session, with complete healing within 4 weeks after individual sessions. After three treatment session the lesion was completely removed. The patient was left with a residual scar on the tongue dorsum. The patient refused corrective excision as the scar does not hinder function and is not an aesthetic concern.

Before

Immediately after Tx1

8 days after Tx1

Complete healing after Tx1

Complete healing after Tx2

Immediately after Tx3

Complete healing after Tx3

Complete healing after Tx3

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He has been involved in the research and development of several oral laser surgical procedures including laser photo-coagulation of intra- and extra-oral vascular lesions and laser ablation of intra-oral leukoplakia.

Laser & Health ACADEMY

Clinical Bulletin 18/09

Facial Skin Rejuvenation

Dr. Chao-Hong Liu is a specialist in Cosmetic Dermatology. He has performed skin rejuvenation treatments with a wide range of different laser types, as well as with intense pulsed light, radiofrequency, and by chemical methods. He works at the Department of Dermatology, at Yuan General Hospital in Kaohsiung Taiwan.

Recommended Parameters:

Laser source:	Er:YAG (2940 nm), PS01 Handpiece
Frequency:	5 Hz
Anesthesia:	None needed
Spot Size:	10 mm

Step	Purpose	Mode	Energy	Pixel Level	Passes	End Point
1	*Polish skin: Remove old or dead keratin*	MSP	500 mJ	*Pixels not used*	1	*Light Skin Immediately*
2	*Smooth Skin /Base Pass: heat skin, stimulate collagen rejuvenation*	SP	500 mJ	2	2	*Warmth and Slight Redness*
3	*Smooth and Enhance Pass: Shrink pore size and fine wrinkles*	LP	800 mJ	2	1	*Warmth and Redness*

(Courtesy of Dr. Chao-Hong Liu)

The minimally ablative treatment protocol outlined in the table above has been used successfully to treat patients presenting with a number of different skin rejuvenation indications: wrinkles, fine lines, sun damaged skin, etc. The case pictured on the right is an example of general facial rejuvenation. During the first step, 1 pass is made across the full face in MSP Mode to cause minimal ablation. The slight ablation removes the old keratin from the skin and lightens the skin immediately. The second step of treatment was comprised of 2 passes of fractionated, short pulse (SP) passes to stimulate collagen rejuvenation: these passes were performed across the cheeks and nose. In step three, 1 further higher-energy, fractionated long pulse (LP) pass was used to rejuvenate and increase thermal effect directly around the nose and under the eyes. The size of this patients' pores was reduced in one treatment, usually patients need four or five treatments to achieve full pore reduction.

Laser & Health ACADEMY

Clinical Bulletin 17/09

Skin Rejuvenation with Pore Size Reduction

Dr. Chao-Hong Liu is a specialist in Cosmetic Dermatology. He has performed skin rejuvenation treatments with a wide range of different laser types, as well as with intense pulsed light, radiofrequency, and by chemical methods. He works at the Department of Dermatology, at Yuan General Hospital in Kaohsiung Taiwan.

Recommended Parameters:

Laser source:	Er:YAG (2940 nm), PS01 Handpiece
Frequency:	5 Hz
Anesthesia:	None needed
Spot Size:	10 mm

Step	Purpose	Mode	Energy	Pixel Level	Passes	End Point
1	*Polish skin: Remove old or dead keratin*	MSP	500 mJ	*Pixels not used*	1	*Light Skin Immediately*
2	*Smooth Skin /Base Pass: heat skin, stimulate collagen rejuvenation*	SP	500 mJ	2	2	*Warmth and Slight Redness*
3	*Smooth and Enhance Pass: Shrink pore size and fine wrinkles*	LP	800 mJ	2	1	*Warmth and Redness*

(Courtesy of Dr. Chao-Hong Liu)

Fig. Cases 1 Before (A) and After (B)

The three step procedure given in the table above has been successfully used in a number of different clinical contexts to effect skin rejuvenation: fine line and pore size reduction, acne treatment, and improvement of discoloration. Experience suggests that by performing these steps in a sequence of treatments greater efficacy can be achieved then if the entire procedure is done with one set of parameters. The case presented was performed on patients with skin types III-IV, both of the patients had mild skin discolorations and enlarged pores. The three step protocol above was done in one treatment session according to the steps presented in the table above. No complications were observed. The patients healed well, the figure shows the treatment area before and shortly after treatment. The tightness of the skin usually continues to improve for a few days after treatment as the body continues naturally remodeling the collagen in response to the LP mode passes performed in step 3.

Laser & Health ACADEMY

Clinical Bulletin

13/09

Tooth Restoration – A Pediatric Case to Demonstrate the Benefits of Using Two Complementary Wavelengths

Carlo Fornaini, MD, DDS, MSc., Professor in Lasers in Medicine

A fourteen-year old patient came to our office presenting a traumatic crown fracture of the permanent, right central incisor. This case study describes how we made use of two complementary wavelength lasers to successfully restore the tooth with a minimum of additional trauma for the patient.

Any dental office frequently sees pediatric patients with traumatic lesions to the upper incisors. Thankfully parents are well-informed through the media and the avulsed fragment will often be preserved in the proper way. In our case the patient came to us immediately after the traumatic incident with the avulsed tooth fragment kept in milk which provided adequate preservation. This enabled us to consider immediate restoration knowing that the rehabilitative bonding would have a good prognosis both from a functional and aesthetic viewpoint.

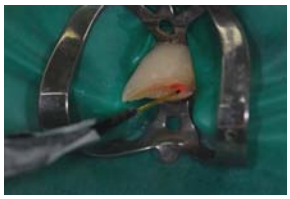
To lessen the ordeal for the already traumatized young patient we decided to treat and benefit from the Er:YAG and Nd:YAG lasers we have at hand in our practice in the Fidelis laser system. The trauma had left the pulp exposed; our first decision was to perform a Nd:YAG laser pulp capping. We then proceeded to use the Er:YAG laser to prepare both bonding surfaces. The surfaces were further prepared with orthophosphoric acid, we applied bonding and subsequently flow composite resin. The Er:YAG laser played a pivotal role in this particular case; we were able to work without causing any additional pain to the patient, keeping trauma for both patient and parents to an absolute minimum. In addition, the Er:YAG's inherent laser action provided decontamination and it increased bond strength. For aesthetic purposes we prepared the borderline area surface with Er:YAG before one more applying orthophosphoric acid and finally flow composite resin. No form of anesthesia was deemed required by us or even requested by the patient.

The tooth was checked monthly for six months and vitality tests were found positive.

Having the Er:YAG and Nd:YAG lasers at hand in a single laser system is of instrumental importance to us in our daily practice. This case demonstrates how their complementary action can be used very efficiently in procedures. Being able to use both lasers without any time delay was very important in this case as it made the treatment fast and less traumatic for the patient, which is paramount in pediatric cases. From a therapeutic and clinical results perspective, we were able to make decisions fast, knowing that the inherent capabilities of the lasers and the system would lead to good results.

	Pulp capping	Surface preparation
Laser source:	Nd:YAG (1064 nm)	Er:YAG (2940 nm)
VSP Mode:	SP	SSP
Power/Energy:	4 W	200 mJ
Frequency:	40 Hz	10 Hz
Handpiece:	R21, 300 µm fiber	R02, tipless handpiece

Before



Pulp capping

Avulsed surface preparation

After

Initial bond completed

Bond after Er:YAG surface preparation.

Dr. Fornaini is a highly accomplished laser dentistry practitioner, researcher and lecturer. In his private practice in Fiorenzuola d'Arda he has a particular affinity for working with pediatric patients. The benefits of the use of laser are particularly highlighted in pediatric dentistry.

For over a decade, he has worked with Fotona laser systems both in practice and in research.

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Laser & Health ACADEMY

Clinical Bulletin 14/09

Unerupted Tooth Exposure Using Two Complementary Wavelengths

Carlo Fornaini, MD, DDS, MSc., Professor in Lasers in Medicine

The surgical exposure of retained teeth is the most important step of orthodontic procedures. It is paramount to the strong adhesion of the bracket to the enamel that the procedure is as minimally invasive as possible and bleeding must be avoided. Nd:YAG laser is an excellent choice of treatment modality as bleeding can be avoided altogether and pain easily controlled both intra- and post-operatively. The Er:YAG laser is for us the modality of choice to expose bone-retained teeth. Due to its highest affinity for water and hydroxyapatite of all hard dental tissue lasers it is capable of ablating bone with less intense laser treatment settings than any other source. The combination of both lasers in orthodontic therapy provides an extremely wide assortment of treatment options and benefits for both the patient and practitioner.

This case study describes the treatment of a sixteen-year old that presented at our office seeking treatment for a malocclusion with agenesis of the upper permanent lateral incisors and inclusion of the upper left canine. After having fitted a fixed apparatus to open space for the lateral incisors, we were able to proceed with a surgical intervention to expose the unerupted canine.

The Nd:YAG laser was used to incise the soft tissue until the bone was reached. We then switched to the Er:YAG laser on the same Fidelis laser system, to further ablate the bone to create a window which would allows us to bond the bracket. The Nd:YAG laser was then once more use to achieve complete coagulation. At this point we were able to apply the brackets to the canine tooth and commence with traction.

Six months after the procedure the tooth reached into the arch and at nine months we were able to remove the apparatus and place temporary prosthetics with lateral incisors. Soft tissues and periodontal structures were found to be in good clinical condition.

We used only a topic anaesthetic (EMLA, Astratech) and the control of pain and discomfort was good during the intervention and in the period after. It was not necessary to prescribe any kind of drug (antibiotics, NSAIDS) therapy, except for mouthwashes with clorexidine.

Dr. Fornaini is a highly accomplished laser dentistry practitioner, researcher and lecturer. In his private practice in Fiorenzuola d'Arda he has a particular affinity for working with pediatric patients. The benefits of the use of laser are particularly highlighted in pediatric dentistry.

For over a decade, he has worked with Fotona laser systems both in practice and in research.

	Soft tissue incision	Bone resection
Laser source:	Nd:YAG (1064 nm)	Er:YAG (2940 nm)
VSP Mode:	SP	MSP
Power/Energy:	4 W	300 mJ
Frequency:	40 Hz	10 Hz
Handpiece:	R21, 300 µm fiber	R02, tipless handpiece

Before

Nd:YAG soft tissue incision

Er:YAG bone resection

Nine months after

Access to tooth complete

Bracket fixed

Laser & Health ACADEMY

Clinical Bulletin

19/09

Dr. Kazak graduated from the Faculty of Dentistry at the Istanbul University in 1987. The following year he co-founded Medicadent, dental health policlinic, where he works as administrator and clinical director, as well as practices in specialized fields of dentistry. In 2007 he completed the RWTH Aachen University Masters program in »Lasers in Dentistry«. He is actively involved in pioneering laser dentistry in Turkey.

Discover AT Fidelis!

Treatment of a Hemangioma on the Lower Lip – Case #1

Zafer Kazak, DDS, MSc. Lasers in Dentistry

The patient was referred to us by their GP to treat a hemangioma on the lip due to the patient's aesthetic concerns. It was the first time the patient underwent any kind of laser treatment.

The treatment of a hemangioma on the lower lip is usually more of an aesthetic treatment, although there is always a risk of excessive bleeding should the lesion be accidentally bitten. We opt to use Nd:YAG laser in our practice to treat these type of lesions, because of the laser's wavelength's ideal absorption characteristics. Nd:YAG targets hemoglobin while leaving the surrounding tissue unscathed, which is particularly important when working on the lips. We find that this in combination with the speed and ease of the treatment give the Nd:YAG laser treatment significant advantages over more conventional treatment methods such as sclerotherapy, excision, cauterization and cryotherapy. We do not use anesthesia, although to limit any excessive thermal effects we do shoot the laser through an ice cube.

Using the parameters below, we applied the Nd:YAG laser three times for a one-minute period and with 1-minute intervals. During the treatment the lesion can be clearly seen shrinking and disappearing. Anesthesia was not required during any of the procedures. Three weeks after the Nd:YAG procedure we used the Er:YAG laser in our AT Fidelis system to remove the coagulated tissue and obtain a better post-op aesthetic effect. No specific post-treatment care was required.

Laser source:	Nd:YAG (1064 nm)	Er:YAG (2940 nm)
VSP Mode:	MSP	VLP
Power / Energy:	5 W	140 mJ
Frequency:	100 Hz	10 Hz
Handpiece:	R21	*Titanium* R02

Before

During

Immediately after

Complete recovery

Laser & Health ACADEMY

Clinical Bulletin 20/09

Dr. Kazak graduated from the Faculty of Dentistry at the Istanbul University in 1987. The following year he co-founded Medicadent, dental health policlinic, where he works as administrator and clinical director, as well as practices in specialized fields of dentistry. In 2007 he completed the RWTH Aachen University Masters program in »Lasers in Dentistry«. He is actively involved in pioneering laser dentistry in Turkey.

Discover AT Fidelis!

Treatment of a Hemangioma on the Lower Lip – Case #2

Zafer Kazak, DDS, MSc. Lasers in Dentistry

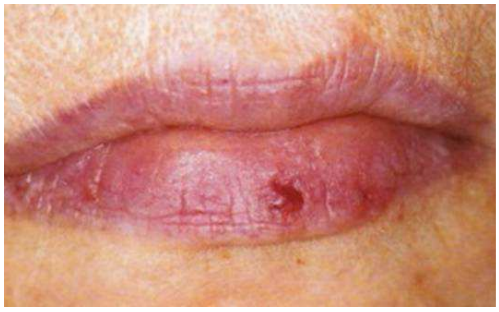
The treatment of a hemangioma on the lower lip is usually more of an aesthetic treatment, although there is always a risk of excessive bleeding should the lesion be accidentally bitten. For these reasons the patient was referred to us by the GP.

We opt to use Nd:YAG laser in our practice to treat these type of lesions, because of the laser's wavelength's ideal absorption characteristics. Nd:YAG targets hemoglobin while leaving the surrounding tissue unscathed, which is particularly important when working on the lips. We find that this in combination with the speed and ease of the treatment give the Nd:YAG laser treatment significant advantages over more conventional treatment methods such as sclerotherapy, excision, cauterization and cryotherapy. We do not use anesthesia, although to limit any excessive thermal effects we do shoot the laser through an ice cube.

Using the parameters below, we applied the Nd:YAG laser three times for a one-minute period and with one-minute intervals. During the treatment the lesion can be clearly seen shrinking and disappearing. Three weeks after the Nd:YAG procedure we used the Er:YAG laser in our AT Fidelis system to remove the coagulated tissue and obtain a better post-op aesthetic effect. .Anesthesia was not required during any of the procedures. No specific post-treatment care was required.

Laser source:	Nd:YAG (1064 nm)	Er:YAG (2940 nm)
VSP Mode:	MSP	VLP
Power / Energy:	5 W	140 mJ
Frequency:	100 Hz	10 Hz
Handpiece:	R21	*Titanium* R02

Before



Immediately after

Complete recovery

Laser & Health ACADEMY