# Discussion: Evaluating radiofrequency as a treatment option for peri-implantitis

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Implant-supported dentures have been established in the last decades. They have become an important part of dentistry. In Germany alone nearly one million implants are being inserted successfully and surgical, prosthetic, as well as dental techniques are far advanced. It is all the more surprising that to this day there are still no distinct therapeutic strategies for peri-implantitis. This is a huge issue, considering that we know that peri-implantitis is always progressive and the lack of treatment inevitably leads to the loss of the implant. This report focuses on evaluating different strategies for the treatment of peri-implantitis.

**Fig. 1: ARROW*tip*™** monopolar microdissection electrode **(REF 36 03 20)**

**Introduction:** Conservative treatment strategies in terms of the disinfection of the exposed and contaminated implant surface do not show a longterm success. The only treatment strategy that seems to be promising to date is implantoplasty. Here inflammatory granulation tissue around the implant is being removed, the implant is being smoothened with a diamond bur, and soft tissue is being reconstructed by an apical flap to restore the biological width at the implant and prevent recurrence of peri-implantitis. Elaborate reaugmentations at the implant and transplants of soft tissue aiming to restore the original state of implant as well as soft and hard tissue is technically possible in individual cases. However, they often fail due to surgical effort, physical strain for the patient, and cost. In our opinion, therapeutic strategies of peri-implantitis have to be maximally efficient. The treatment has to be fast, it must not lead to considerable discomfort for the patient, and it must be cost-efficient. This is to ensure that peri-implantitis is being surgically rehabilitated in time, and that the large mass of the already affected implants is being treated.

**Methods:** This is why we have developed a surgical treatment using radiofrequency. It is based on conventional implantoplasty. Using a monopolar microdissection electrode (ARROWtip™, Sutter Medizintechnik GmbH) and 4 MHz radiofrequency current at 18 to 25 watts (CURIS®, Sutter Medizintechnik GmbH), the peri-implant soft tissue is removed in a circular fashion so that the exposed surface of the implant is accessible. The main advantage of radiofrequency surgery is that the infected peri-implant tissue is not burnt, but vaporized. Studies have shown that adjacent tissue does not experience any thermal damage – similar to the $CO_2$ laser. Clinically, the actual advantage is that the removal of peri-implant tissue can be done without considerable bleeding. This is of key importance to expose the peri-implant bony defect. Touching the implant with the radiofrequency electrode for only a short time has not been a problem so far. At this point, the exposed implant connections can be removed with a red or green diamond bur. Following this, no suture or flap is necessary. If insufficient soft tissue is the cause of the peri-implantitis, we perform a vestibuloplasty after one or two months using radiofrequency on the affected implant.

**Results:** Radiofrequency treatment of peri-implantitis is very easy and can be done in a few minutes. The treatment is performed under local anesthesia. Due to the characteristics of radiofrequency with its high energy density and low carbonization of remaining tissue the patient experiences barely any discomfort. A mild analgetic one day postoperatively is sometimes necessary. Occassionally, patients report a

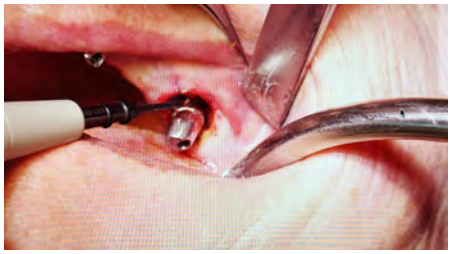

**Fig. 2 and 3:** Removal of peri-implant soft tissue with **ARROW*tip*™** monopolar microdissection electrode

**Fig. 4:** Smoothing the implant surface with diamond bur

**Fig. 5: CURIS®** 4 MHz radiofrequency generator

mild swelling on the first and second day postoperatively, especially if several implants were treated. Patients should not brush the area extensively for the first two weeks after surgery, but can eat and go on with their daily routine. Patients tolerate the treatment very well, since it is fast, there is little discomfort, and costs are relatively low. In addition, chronic discomfort usually disappears after a few days, due to the fact that the patient is able to clean the implant better and especially in the case of several affected implants, oral hygiene is improving noteably. Many patients are also reporting improvement of taste.

Since the wound healing is secondary, a mild swelling and fibrin layer can be observed in the first two weeks postoperatively. Mechanical strain can occassionally lead to small bleedings, similar to abrasion. We recommend to inform the patient about this. As the tissue is not burnt, there is usually no scarring, but a reepithelization of the wound. The final result can be expected four to eight weeks postoperatively at the earliest. The goal is to remove the pocket and to restore the biological width, so that the tissue is tightly wrapped around the implant shoulder. Of course, the implant is usually visible now. The patient should be informed about this prior to the treatment. This is why this kind of treatment is only recommended for side teeth. If the peri-implantitis does not reoccur within three to six months, we consider a more comprehensive surgical approach of hard and soft tissue in terms of a reaugmentation, vestibuloplasty, or transplantation of soft tissue at this point.

**Conclusions:** As a clinic focusing on implantology, we are glad to have found an effective solution for the treatment of peri-implantitis by use of radiofrequency. We cannot present evident data; however, the recurrence rate is very low. Patient acceptance is so good that the patient agrees to have another RF implantoplasty after years.

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Obviously, surgical approaches are limited even with this method. It significantly depends on the type of infrabony pocket at the implant. Losing the bony attachment in the upper third has a good prognosis. Furthermore, the cause for the development of peri-implantitis is crucial for the success. Peri-implantitis caused by prosthetic flaws can be treated very well. If the soft tissue is causing the peri-implantitis, it has to be reconstructed even after successful implantoplasty. If an augmentation has failed long-term, the above mentioned procedure is a good method to preserve the implant. The prognosis is significantly worsening with the depth of the infrabony pocket. Close-set implants relating to neighboring teeth with concave defects have a bad prognosis as well. In general, it can be said that molars in the maxillae can be treated better than in the mandible, especially if the peri-implantatis is extending far lingually in a concave shape. In this case an explantation should be considered in time.

In general, there is a high interest in an efficicent therapy of peri-implantitis. Radiofrequency surgery in oral surgery and implantology is still relatively new. Obviously, scientific studies will have to support our clinical treatment approach in the future. We are confident in this regard since the long-term successful clinical results to date are promising.

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## Product Information

| Qty. | REF | Description |
|---|---|---|
| 2 | **36 03 20** | **ARROW*tip*™** monopolar microdissection electrode<br>Ø 0.3 mm, straight, total length: 57 mm |

**[REF 87 00 10] CURIS®** 4 MHz radiofrequency generator
basic set with single-use patient plates

| Qty. | REF | Description |
|---|---|---|
| 1 | **36 01 00-01** | **CURIS®** 4 MHz radiofrequency generator<br>(incl. mains cord, user manual and test protocol) |
| 1 | **36 01 10** | Foot switch two pedals for CURIS® (cut & coag), cable: 4 m |
| 1 | **37 01 54L** | Bipolar cable for CURIS®, length: 3 m |
| 1 | **36 07 04** | Monopolar handpiece (pencil) cut & coag, shaft 2.4 mm, cable: 3 m |
| 1 | **36 02 38** | Cable for single-use patient plates, length: 3 m |
| 1 (x50) | **36 02 22** | Safety patient plates, single-use, packing 5 x 10 pcs. (not shown) |

**Unit settings / Other accessories***

**CURIS®**
4 MHz radiofrequency generator

**ARROW*tip*™** microdissection electrode: Monopolar CUT 2
Power adjustment: 15-25 watts

**Valid for the CURIS® with the orange label.**

**CURIS®**
4 MHz radiofrequency generator

**ARROW*tip*™** microdissection electrode: Monopolar CUT 2
Power adjustment: 23-40 watts

* Please consider that this information is not meant to serve as a detailed treatment guide. Always adjust according to patient and application.

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The listed lengths and sizes serve as a guideline and may be rounded up or down. The actual lengths may vary slightly.

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