

Tonsillotomy methods in comparison: Using the CURIS® 4 MHz radiofrequency generator and the CO₂ laser

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In recent years intracapsular tonsillotomy (TT) has experienced a revival in the treatment of non-inflammatory hyperplasia of the palatine tonsils in small children. In Germany, surgical tonsillotomy interventions are on the rise and sometimes are even more popular than tonsillectomy. There is still a lack of studies comparing TT with the laser and radiofrequency (RF) in literature.

Introduction: The introduction of the CO₂ laser as a tool for surgical resection has lowered the risks involved in the procedure, postoperative morbidity and the length of the hospital stay for patients. While preserving the immunobiological function of the remaining tonsils, the laser comes, however, with a significant investment in equipment and special safety features that are not required for radiofrequency tonsillotomy [7].

Generally speaking, as has also been confirmed through animal testing [8], radiofrequency is gentler to the tissue in surgery than the laser. This is due to the temperatures, which will always be below 100 °C in radiofrequency surgery and which may rise above 300 °C with the laser [1]. The high temperatures of the laser lead to tissue carbonization more quickly [4]. As a result, the healing process after laser surgery is longer than after radiofrequency applications [5]. When using both methods on the velum, laser UPPP (LAUP) has been reported to be more painful than RF-UPPP [2, 3].

Furthermore, the initial costs of equipment for radiofrequency are significantly lower than for laser surgery.

The goal was to compare two methods for tonsillotomy surgery (RF-TT vs. L-TT) in a prospective, randomized study in our clinic.

Materials and methods: 101 children were included in a prospective, randomized study (n=101, 63 m, 38 f, between 1 and 11 years of age, median 4 years). All patients suffered from symptomatic hyperplasia of the tonsils (failure to thrive, infantile obstructive sleep apnea, dysphagia) so that treatment of TT was indicated. Criteria for exclusion were previous tonsillitis, coagulation disorders, and severe secondary illnesses. Surgery was performed by two surgeons either with the CO₂ Laser (Martin company, Tuttlingen/Germany) or using RF (CURIS® 4 MHz RF generator, Sutter, Freiburg/Germany).

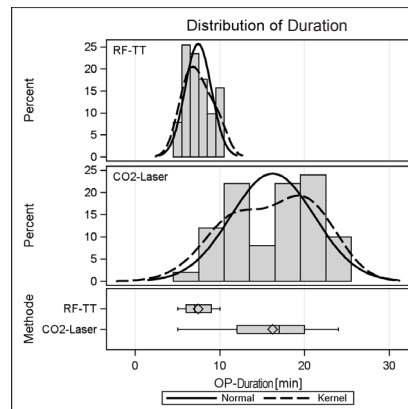
51 patients were referred to the RF-TT group and 50 patients to the L-TT group.

All the data used in the study were recorded by two blinded co-workers (not the surgeons). The data covered were for example: age, sex, duration of the surgery, adjustment of watts on the unit, intraoperative bleeding, number of intraoperative bipolar coagulations, maximum temperature during hospital

stay, total number of days when patient ran a temperature, days when patient refused food, length of postoperative antibiotics administration, length of postoperative analgesia and thickness of wound debris postoperatively from day 1 to 5.

For both surgical methods, a t-test and bilateral Wilcoxon test were used to compare the quantitative variables while the exact Fisher test was used for the qualitative variables.

Results:



The duration of an operation varied significantly ($p < 0.0001$) with RF-TT from 5 to 10 minutes (median: 7 min) and L-TT from 5 to 24 minutes (median: 17 min).

Although intraoperative bleeding was insignificant ($p = 0.0316$), there was still a striking difference:

76% of the RF-TT patients suffered from no or only minor bleeding as compared to 56 % of the patients who underwent L-TT. Medium and severe bleeding occurred more often with L-TT patients.

74 % of the patients who underwent laser surgery were without pain on the 11th day postoperatively as compared to 45.1 % of the patients who were treated with RF ($p = 0.0095$).

As for the other parameters, there were no apparent differences between the two surgical methods.

Conclusion: Both the CO₂ laser and RF offer safe methods for the treatment of non-inflammable, symptomatic hyperplasia of the tonsils by tonsillotomy in infants.

There is no significant difference regarding intraoperative blood loss although the CO₂ laser tends to lead to stronger intraoperative bleeding requiring more frequent hemostasis. Postoperative pain, use of medica-



Fig. 1: CURIS® 4 MHz RF unit (Sutter, Germany)

tion, the duration of the hospital stay and food intake as well as postoperative bleeding requiring treatment were comparable for both methods.

The risks from burn injuries, in particular the dreaded [CO₂] tube fire with a high mortality rate, are considerably lower in RF tonsillotomy. The duration of the operation – and thus anesthesia time – were significantly shorter with the RF method. Radiofrequency surgery for tonsillotomy with the CURIS® 4 MHz RF generator is safe and user-friendly. Additionally, compared to the CO₂ laser, the costs for purchasing and maintaining RF equipment are much lower.



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1	36 07 04	Monopolar handpiece (pencil) cut & coag, shaft 2.4 mm, cable 3 m
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1 (x50)	36 02 22	Safety patient plates, single-use, packing 5 x 10 pcs. (not shown)



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CURIS® 4 MHz radiofrequency generator
ARROWtip™ electrode: Monopolar CUT 2
 Power adjustment: 20-25 watts
Super Gliss® non-stick: PRECISE
 Power adjustment: 15 to 30 watts

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ARROWtip™ electrode: Monopolar CUT 2
 Power adjustment: 25-46 watts
Super Gliss® non-stick: PRECISE
 Power adjustment: 15 to 30 watts

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



* 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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