Introduction.

The development trend of modern medicine is minimal invasiveness while maintaining sufficient radicality . This is aided by a great deal of new knowledge, revolutionary technical achievements and work approaches. Examples of this are numerous - an excimer laser for myopia, radio frequency thermoablation in the treatment of liver metastases, the use of a harmonic scalpel in endoscopic or open surgery. These are all examples where minimum damage is incurred on the "way" to a treating an organ with the same radicalism as with traditional surgery. The ultrasonic knife and radiofrequency thermotherapy have entered medicine in a multidisciplinary way, which, however, remains incomparable with the expansit of the phenomenon called laser.

Lasers bring together a group of devices with very diverse characteristics, enabling applications in many fields of medicine.

Wavelength defined by an active medium, coherence, collimation and monochromaticity predisposes lasers to a single technically unique selective influence of various tissues with their great energy. This enables a device belonging to a group of lasers to crush kidney stones, as well as evaporate a cornea or cut enamel.

Objectives of the work.

Our objective was to determine the benefits of laser medicine to minimize invasiveness in tonsillectomies in comparison with conventional tonsillectomies and two other methods commonly used in minimally invasive medicine - the harmonic scalpel and the radiofrequency scalpel.

Material and Methods.

Our study was conducted at the ENT Clinic at the University Hospital in Pilsen from January 2009 to May 2013. This was a prospective, partially blinded study that included patiens with the diagnosis of chronic tonsillitis with surgical treatment indicated.

The patients sample (n = 40) was divided into 4 groups of ten respondents according to the type of method used in right-side tonsillectomies . Left-side tonsillectomies were all done in the traditional way.

Right-side tonsillectomies were performed in group A using an incision fiber laser (Ho:YAG) laser, in group B with a patented cooling tissue water jet and air (Er,Cr:YSGG), in group C with a radiofrequency scalpel and in group D with harmonic scalpel.

In all four groups, methods were evaluated in terms of the surgeon’s and the patient's perspective .The surgeon evaluated intraoperative bleeding during the operation , the orientation of the tissue and post-operative complications . The patients also evaluated the development of pain in the postoperative period.

We evaluated differences in right-side tonsillectomies groups against each reference performance, which was established as left-side tonsillectomies performed in the traditional way .

Results.

The tested Ho:YAG laser demonstrated excellent hemostasis, dissection skills and good clarity of prepared tissues. In terms of postoperative pain and healing, it didn’t differ significantly from that experienced during the postoperative period of conventional tonsillectomies.

The Er,Cr:YSGG laser had good hemostasis with slower preparation abilities and good clarity of tissue. In terms of postoperative pain and healing, it also didn’t differ significantly from that experienced during the postoperative period of conventional tonsillectomies.

The radiofrequency scalpel showed good hemostasis , with tissue orientation marginally better than in conventional tonsillectomies. Not even this device displayed significant deviations from conventional tonsillectomies in terms of postoperative healing and pain.

The harmonic scalpel showed excellent hemostasis and good dissecting abilities with good orientation in the tissue . The postoperative period was again only marginally different.

In the whole group, there were 2 cases of postoperative bleeding-1 in the conventional tonsillectomy and 1 in the harmonic scalpel tonsillectomy. Other complications were observed.

Conclusions.

Despite partial differences in the monitored parameters, we did not find signifiant benefits for patients when using either laser devices or the radiofrequency or harmonic scalpel. We believe that there is no reason for the blanket application of these operations, and the devices tested have not advanced the performance of tonsillectomies in terms of minimizing invasiveness. Given the brilliance of using our proven devices in their basic indications and their undeniable contribution to the minimization of the invasiveness of these procedures, the explanation offered is that in terms of the pain experienced after tonsillectomies, the relative size and exposure of the open sore area is a more fundamental factor than the choice of surgical methods.

Keywords.

Minimally invasive medicine - tonsillectomy - laser - radio frequency thermoablation - harmonic scalpel