

From the history of medicine

TWENTY-FIVE YEARS OF THE FUNCTIONAL ENDONASAL ENDOSCOPIC SINUS SURGERY IN CROATIA

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Summary

The aim of this article is to give an overview through twenty-five years of endonasal endoscopic functional sinus surgery (FESS) in Croatia. The first operation of this type took place on December 6, 1990 at the Dept. of ENT Head & Neck Surgery, Clinical Hospital Center Zagreb, Croatia. The surgeon was Ranko Mladina. Later on Zagreb FESS School grew up and reached the high international level giving the rhinosinusologic community all over the knowledge on a new syndrome (Two Holes Syndrome) as a subclass of chronic rhinosinusitis, than the most popular and widely accepted method for teaching, learning and training the FESS surgical techniques developing the concept of the Lamb's Head FESS Dissection, and, finally a specific "5-steps technique" in performing the endonasal endoscopic orbital decompression. A retrograde elevator, crucial instrument for an non-traumatic orbital decompression, has its origin from Zagreb as well as the lamb's head holder for the training dissections. During these 25 years 17 CIRAS (Croatian International Rhinosurgical Advanced School) have been organized dispersing the most recent knowledge of this discipline to numerous participants coming from all over. One fundamental textbook on this technique has been published in 1994 and later on two manuals on lamb's head surgical anatomy and details how to dissect paranasal sinuses in this model (besides Croatian edition, it has been translated also in English, Italian, Russian and now in Chinese language) as well as a manual on 5-steps techniques for the orbital decompression.

Key words: Functional Endoscopic Sinus Surgery; orbital decompression; lamb's head dissection; CIRAS; retrograde elevator; Two Holes Syndrome.

HOW IT BEGAN AND WHAT HAPPENED DURING A QUARTER OF THE CENTURY?

Twenty-five years have passed since Ranko Mladina performed the first endonasal endoscopic functional surgery on the patient suffering from chronic rhinosinusitis

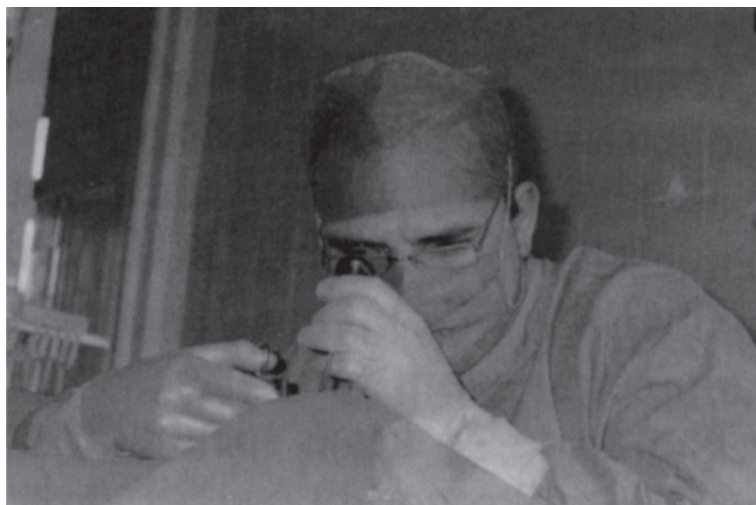


Figure 1. Mladina performing the first FESS ethmoidectomy on December 6, 1990



Figure 2. The 1st CIRAS in Zagreb, 1993. From left: Mladina as a speaker, Prof. Krajina, Prof. Subotić, Prof. Passali (Rome), Dr. Budrovich (Belluno), Dr. Gnjidić (neurosurgeon), Dr. Hat (radiologist)

(CRS). The left-sided classical uncinectomy, middle antrostomy, and anterior ethmoidectomy have been performed under the general anesthesia on the day December the 6th 1990 at the Dept. of ORL Head & Neck Surgery, Clinical Hospital Center Zagreb, Croatia (Fig.1). The nowadays advantages of hypotensive anesthesia were not yet developed at that time in general, neither we had the opportunity to have a preoperative CT scanning. The preoperative diagnosis has been established on anamnestic data, endoscopic examination of the nasal cavities and classical tomograms of the paranasal sinuses. Anesthesiologist was late Dr. Božica Trupković xFotivec, whereas the instrumental nurse was a Saint Cross order's nun Judita (Lucija Baotić).

Shortly after the first procedure has been performed, few other colleagues from the same Clinic joined Mladina, and started to perform this type of sinus surgery as well. In this way, the concept of the endoscopic aspect of the CRS started to grow in Zagreb. Surprisingly, despite the Homeland War started in the year 1991, this technique continued to spread all over Croatia. So, in the year 1993, within the frame of the celebration of the 72th anniversary of the ENT Clinic Šalata, the first Croatian International Rhinosurgical Advanced School (CIRAS) has been organized (Fig. 2).



Figure 3. Mladina's textbook on Functional Endoscopic Sinus Surgery edited by „Školska knjiga“ Zagreb in the year 1994

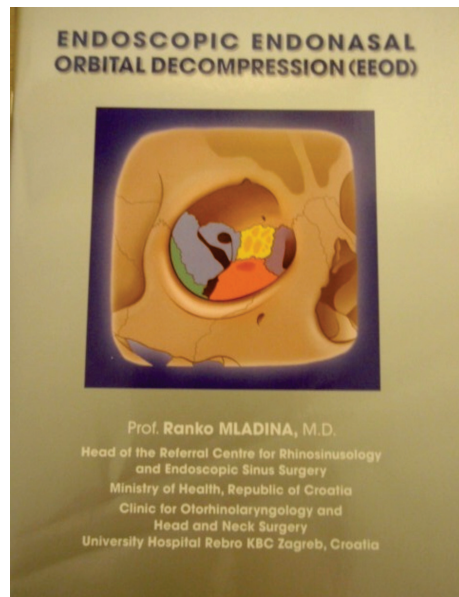


Figure 4. Mladina's „Doctor-to-Doctor“ Karl Storz manual on his own technique named „5-Steps Endonasal Endoscopic Orbital Decompression (EndoPress, Tuttlingen, 2008)

The invited international speakers were Prof. Dr. Desiderio Passali and Dr. Romeo Budrovich, both from Italy. One of the invited speakers was Dr. Josip Hat, a radiologist from Zagreb who was a pioneer in the field of computed tomography imaging of the paranasal sinuses. That was the crucial time for us as we finally could start ordering preoperative diagnostic CT scans. Computed tomography produced the paradigm shift in understanding and therapeutic approaches to the paranasal sinuses. Those who did not believe us at that time, changed their opinion, and by time CT of the paranasal sinuses became a routine diagnostic step.

Because of our will to spread the idea and practice of functional endonasal endoscopic sinus surgery out of Zagreb, i.e. throughout Croatia, we continued with CIRAS courses and thus in the year 1994. The 2nd CIRAS has been successfully organized in Split, the capital of Dalmatia region, under the direction of Dr. Glunčić. The biggest editing house in Croatia, "Školska knjiga", has published the fundamental textbook on functional endonasal endoscopic sinus surgery written by Ranko Mladina [1], (Fig. 3). This textbook was intended to help other colleagues from other hospitals in Croatia to accept this technique and to serve as a real prop for all those who were enthusiastic and brave enough to start with this technique by themselves, far from the big centers. Next year (1995) the 3rd CIRAS has been organized in Osijek, the capital of Croatian region Slavonija, which at that time stood at the very borderline with the enemy army. This CIRAS passed, but nobody who was there will ever forget the terrible moments and sounds when bombs and grenades have been used by enemies during the live surgery sessions, lectures etc...

In the year 1996, the 4th CIRAS has been organized in Bjelovar, small town, some 50 kilometers northwest from Zagreb, under the direction of Dr. Piškorić. The fifth CIRAS took place in the year 1997 in Slavonski Brod, the town which General Hospital has achieved the greatest experience in the treatment of all kinds of war injuries. The local leader of the course organization was Dr. Danić.

After the first five CIRAS meetings, we were very satisfied since it became obvious that the idea of the endonasal endoscopic diagnosis and surgical treatment became almost a routine in various places in Croatia.

At the same time, Croatian concepts in functional endonasal endoscopic surgery started to interfere with the world trends in the development of this item. In terms of that, after collecting a huge number of operated patients suffering from dysthyroid orbitopathy, Mladina wrote about his own way of performing orbital decompression, called 5-STEPS TECHNIQUE OF THE ENDONASAL ENDOSCOPIC ORBITAL DECOMPRESSION (2008), [2]. This has been published by EndoPress Tuttlingen, Germany, as a manual belonging to the well known chain of manuals of Karl Storz Company (Tuttlingen, Germany), so called "Doctor-to-Doctor" manuals,

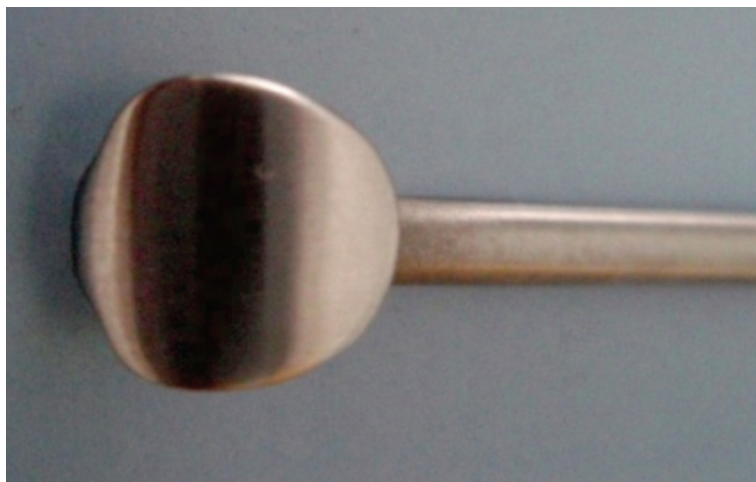


Figure 5. Mladina's retrograde elevator for endonasal endoscopic orbital decompression (the view from above), produced by Karl Storz GmbH, Germany

or popular "Silver Booklets" (Fig. 4). In this way the technique from Zagreb school became popular worldwide. Parallel with that event, a new endoscopic instrument, invented by Mladina, has been added to Karl Storz armamentarium for the endonasal endoscopic orbital decompression: a retrograde elevator (Fig. 5). The purpose of this instrument was to allow the elevation of lamina papiracea of the medial orbital wall in a retrograde manner, without uncontrolled and undesired tearing of periorbital sac. After the non-traumatic elevation of the bony wall, it was finally possible to make parallel, horizontal and highly controlled incisions of the periorbit without making any damages to the surrounding tissues.

From the year 1998 all CIRAS meetings and courses have been organized in Zagreb exclusively.

A big shift in CIRAS practice happened in the year 2000 when the exercises on the lamb's head animal model have been introduced officially in the program. The special Head holder instrument has been developed by Bacc. Arch. Ivan Mladina, originally an architect, together with Karl Storz Tuttlingen, and all the problems on how to maintain the animal head in place and in an individually desired position during the endoscopic trainings and learning endoscopic endonasal techniques, was entirely solved for ever (Fig. 6).

The new "Doctor-to-Doctor" manual originated from Zagreb, dedicated to this kind of training, learning and teaching endoscopic endonasal surgical techniques has been published, again by Karl Storz EndoPress Tuttlingen, Germany [3], (Fig. 7).

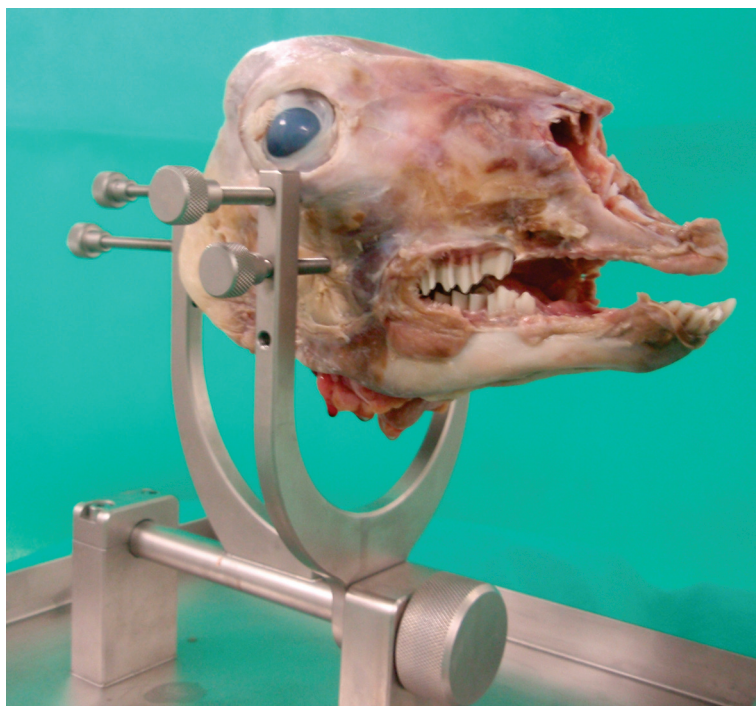


Figure 6. The lamb's Head Holder in use. The lateral and occipital screws fix the head in the desired position and can be changed during the procedure according to surgeons' comfort. The main screw (red arrow) allows controlled rotation of the main axis and adaptation of the lamb's head in an oblique position which additionally upgrades surgeon's comfort

From the very beginning, this textbook became very popular in several countries and because of their great interest it has been translated within the next 2-3 years in English, Russian and Italian languages. Today, in the year 2016, a Chinese edition is under preparation.

Finally, almost parallel to the growth of popularity of the Lamb's Head Dissection concept, Karl Storz also developed a navigational system with very user-friendly protocol, which enables all colleagues dealing or trying to deal with this kind of surgery to exercise also the dexterity in the use of navigational systems. In the year 2014 the video on all the steps of the Lamb's Head Dissection has been produced and placed on the domain www.ciras.eu, thus becoming available for everybody in the world permanently.

In the year 2010 CIRAS was awarded for its great international echo and value by getting permanent auspices of the European Rhinologic Society (ERS)!

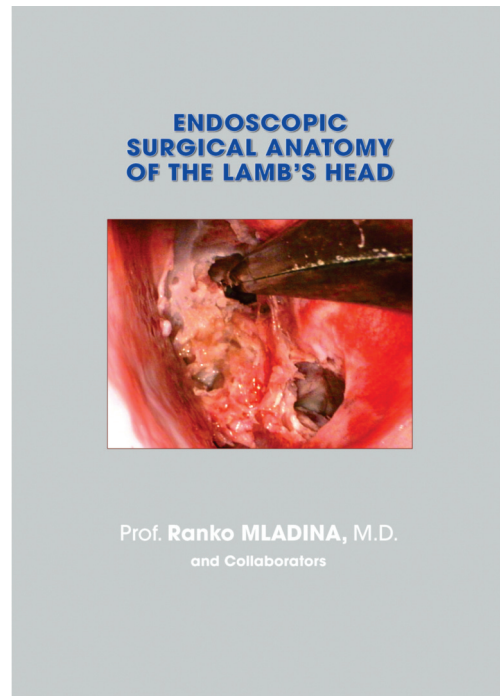


Figure 7. The „Doctor to Doctor“ manual on Endonasal Endoscopic Lamb’s Head Dissection which involves also the most precise anatomical analysis of the lamb’s head and particularly paranasal sinuses ever published owing to a great help of colleagues from Veterinary Faculty in Zagreb

From the year 2011 the Dept. of ORL Head & Neck Surgery of the Clinical Hospital Center Zagreb has its own navigational system and a harmonic scalpel which made the progress in operating the most difficult cases of the tumors of the skull base, clivus, optic nerve and the pterygopalatine fosse (Ass. Prof. Martin Jurlina and Dr. Gorazd Poje). The demanding pituitary gland surgery using the transnasal endoscopic trans-sphenoidal approach in very selective tumors of the pituitary gland also became relatively simplified for the endoscopic surgeon by means of the use of the navigational system (Dr. Marcel Marjanović Kavanagh). In this way our centre became one of the rare centres in Europe which is capable to fight against such cases at the highest level!

The CIRAS web-site offers also a Gallery. One click is enough to see how many of the world famous endonasal endoscopic sinus and skull base surgeons have been invited and participated to the CIRAS meeting over the last 15 years, and particularly how many of them have been dissecting the lamb’s head affectionately and with a great passion, beginning with the icon in this surgical science (David Kennedy) and others.

Today, 25 years after the beginning, despite the 4-years lasting difficult Homeland war, Croatian endonasal endoscopic sinus surgery stays along with the biggest

centers in much larger countries in the world, be it from the aspect of technical level of the surgical procedures, be it regarding the own techniques which have been generally accepted all over the world, starting from endonasal endoscopic orbital 5-steps decompression technique, up to new diagnoses in rhinosinusology, like the THS (Two Holes Syndrome), [4], a Cob-web rhinitis [5], and the importance of two absolutely dominantly inherited types of nasal septal deformities, types 5 and 6 according to Mladina's international classification, 1987 [6,7]. The last perhaps will essentially contribute to both future of rhinosinusology and cardiology, and perhaps will open the door to the essential prolonging of the human life in general.

Acknowledgments

Ranko Mladina and his team (Martin Jurlina, Gorazd Poje and Marcel Marjanović Kavanagh) express their sincere gratitude to Karl Storz GmbH, Tuttlingen, Germany, for their great support through all the period of 25 years of the development of this kind of medical skills and philosophy regarding diagnosing and surgical treatment of sinus diseases in Croatia.

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Sažetak

25 godina endoskopske sinusne kirurgije u Hrvatskoj

U ORL klinici Kliničkoga bolničkog centra Zagreb 6. prosinca 1990. izvedena je prva endoskopska operacija sinusa – izveo ju je dr. Ranko Mladina. Time počinje era razvoja endoskopske misli u dijagnostici i kirurškom tretmanu nosnih bolesti, navlastito kroničnog rinosinuitisa. Razvijena je poznata zagrebačka škola FESS-a s međunarodnim odjekom koji se manifestirao objavljivanjem čak dva kirurška priručnika na hrvatskom i engleskom jeziku, a priručnik o vježbanju kirurške tehnike endoskopskih sinusnih operacija na janjećoj glavi preveden je još i na talijanski, ruski i kineski jezik. Iz te je škole proizašao i novi kirurški instrument za atraumatsku endoskopsku dekompresiju orbite i nezaobilazni držač za janjeću glavu pri kirurškim vježbama, oba proizvedena u njemačkoj tvrtki Karl Storz GmbH u Tuttlingenu.

Ključne riječi: funkcijska endoskopska sinusna kirurgija; orbitalna dekompresija; disekcija na janjećoj glavi; CIRAS; retrogradni elevator; Two Holes Syndrome (sindrom dvaju otvora).