NEW METHOD FOR MINIMALLY INVASIVE MICROSURGERY AND SURGICAL SMOKE MANAGEMENT

Efficient and safe method to remove surgical smoke produced by laser or electrosurgical instruments form very small endoscopic cavities.

Priv.-Doz.Dr. Dietmar Mattes and Dr. Monika Mayer, Department of Ophthalmology and DI Edah Silajdzic

Surgical smoke occurs during Laser ablation and electrocautery diathermia. During these procedures incomplete combustion emerges which creates hazardous surgical smoke.

Surgical smoke contains: water vapour, carbon dioxide, carbon monoxide, ammoniac, hydrogen cyanide, volatile organic compounds (aldehyde, benzene, toluene...), surgical particulate matter, carried away tissue fragments, aerosols...

Furthermore surgical smoke is:

- Cytotoxic
- Mutagenic
- Carcinogenic
- Teratogenic

This is **hazardous for surgery personal and patients**! Moreover surgical smoke causes **sight obstruction for the surgeon**.

SPECIFICS OF ENDOSCOPIC SURGERY

Working in a closed cavity where leakage of surgical smoke on its own is not possible. Amplification of cytotoxic, mutagenic and carcinogenic effect in this closed cavity.

Carbon monoxide has systemic effects on cardiovascular system.Risk of gas embolism because only limited gas exchange is possible. Surgical smoke causes sight obstruction for the surgeon.

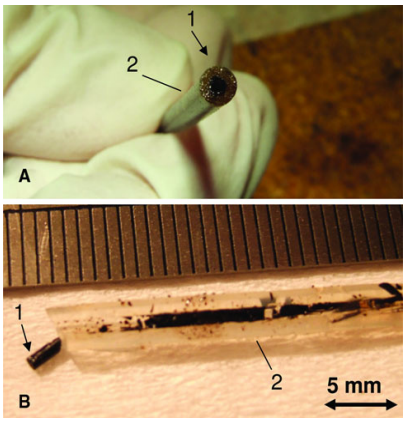

Fig.1: An experimental sucking tube with an inner diameter of 1.0 mm was completely choked after 25 s of sucking surgical laser smoke. A transparent silicone rubber tube was used instead of the steel needles used in the preceding experiments to permit better visualization of the perimental sucking tube (2). B The sucking tube (1)was cut longitudinally after the sucking experiment to permit visualization of the soot(2)

TECHNICAL ADVANTAGES

- ✓ suitable for all endoscopic smoke producing procedures
- ✓ high volume smoke evacuation simultaneously with intracavitary pressure control
- ✓ even suitable for very heavy smoke producing procedures like laser endovaporisation
- ✓ enables further endoscopic minaturization for minimally invasive surgery
- ✓ separated or integrated in endoscope
- ✓ suitable for established and new surgical applications

HEALTH ADVANTAGES

- ✓ minimizing smoke exposure for patient and surgery personal
- ✓ minimizing risk of gas embolism
- ✓ prevents sightobstruction for the surgeon

COLLABORATION DETAILS

Collaboration can be in the form of a license agreement or a research cooperation.

Partner should provide support in manufacturing, marketing, advertising and distribution of the system.

Possible Partners:

- ✓ manufacturer or developers of medical devices
- ✓ research institutes and companies

DEVELOPMENT STATUS

- ✓ patent pending
- ✓ working prototype models

CONTACT

Dr. Heidi Schmitt
Technology Transfer Office
Auenbruggerplatz 2
A-8036 Graz
+43-316-385-72018
heidi.schmitt@medunigraz.at