

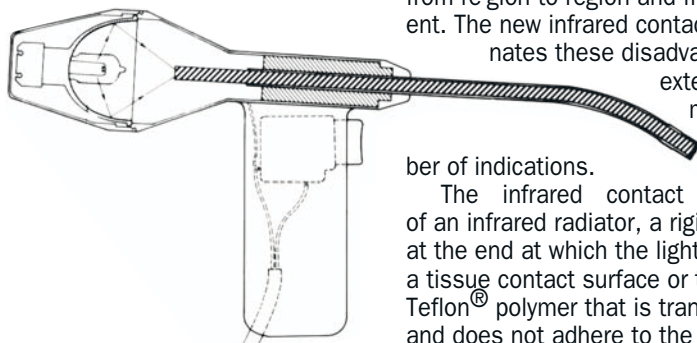
INFRARED-COAGULATOR



LUMATEC®

SYSTEM

In infrared contact coagulation the tissue is coagulated not by means of an electric current but with infrared radiation. In treatment mechanical pressure and radiation energy are applied simultaneously. The process of electrocoagulation used to date is based on the heat of resistance (joule heat) produced when high-frequency currents flow through body tissue. This requires two electrodes – one inactive, with a large surface area and usually applied to a region on the upper leg, and one small, active, operating electrode. A basic shortcoming of this method is the adhesion of the metal electrodes to the tissue, which is particularly troublesome in the treatment of parenchymal bleeding. A further drawback is that the extent of the necrosis produced by the operation is difficult to control. In addition, the morphologically determined electrical conductivity relationship varies from region to region and from patient to patient. The new infrared contact technique eliminates these disadvantages and notably



Hand applicator with lightguide

extends the range of methods for haemostasis in a number of indications.

The infrared contact coagulator consists of an infrared radiator, a rigid light guide curved at the end at which the light emerges, and a tissue contact surface or tip made from a Teflon[®] polymer that is transparent to infrared and does not adhere to the tissue. The infrared radiation is focussed into the light guide. A low-voltage tungsten-halogen lamp (15 V) produces the beam in a gold-coated reflector housing.

The red light and infrared leakage radiation is allowed to escape outside through the red lamp casing, thus preventing the coagulator from overheating and making it unnecessary to provide an expensive cooling system. The optimal amount of energy to be transferred into the tissue can be preset exactly by means of a timer and reproduced at all times.

The ergonomically designed applicator, fitted with a hand-operated switch and supplied with low voltage by means of a flexible lead, enables the doctor to work in a simple and convenient manner.

ADVANTAGES

- Coagulation time only 1 - 3 seconds
- No tissue adhesion
- Precisely adjustable depth of necrosis
- Simpler and more effective than injection treatment (proctology)
- Also suitable for blood staunching
- Various interchangeable light guides
- Safe low voltage
- No danger of explosion in the intestine

(proctology)

- No effect on cardiac pacemakers
- Can also be used during pregnancy
- No inactive electrode
- Can be sterilized by gas (60°C) or liquid.

APPLICATION

Because of its advantages and problem-free operation, this new instrument for contact coagulation can be used in a number of applications. Thus, the equipment can be used in the operating theatre as well as in the out-patient departments of clinical and general practices.

The instrument has so far proven successful in the following applications:

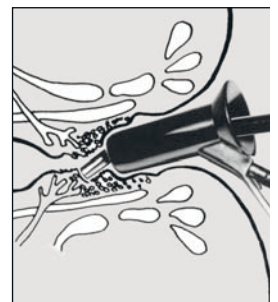
PROCTOLOGY

The aim of any obliteration therapy is to throttle off the vessels by scar tissue shrinkage. This is achieved in an ideal manner by the infrared coagulator. In this application the advantages mentioned in the description of the system, such as the possibility of precise dosage of the thermal energy and the lack of adhesion of the probe, are of decisive importance. The pulse length determines the depth of the necrosis produced, its circumference corresponding to the diameter of the lightguide used.

However, the penetration is limited to a maximum of 3 mm, since if maintained for too long the beam would cause the tissue to carbonize at the surface. It is not possible to control the penetration to such an exact degree either with electrocoagulation or with hot and cold probes, and similarly not by means of sclerosing drug injections.

The hemorrhoids are first located with a proctoscope and the light guide of the infrared coagulator is then inserted into the anoscope. The light guide, which has a slight curve at its far end, is positioned just above the hemorrhoidal nodes and the infrared lamp is switched on by a switch on the instrument's pistol grip.

A second coagulation, rotated 90° clockwise, is then performed. Since the tip of the probe is coated with a special polymer, it does not adhere to the mucous membrane after the irradiation and can be easily lifted off without tearing the tissue. The irradiated site appears as a circumscribed area of greyish mucous membrane. After one week it is still visible as a slightly in-drawn spot with a reddish colour due to capillarization. After two weeks only a discrete scarred area of in-drawn mucous membrane can be seen, which can no longer be located after 3-4 weeks as normal mucosa grows over the site of the operation.



The light guide tip is placed above the hemorrhoidal convolution

The infrared coagulator is suitable for hemorrhoids of first and second degree and particularly for bleeding hemorrhoids. As a rule, a general anaesthetic is unnecessary,

although it is recommended in sensitive patients in the outer anal region in front of the linea dentata.

Comparisons with patients treated by sclerosing drugs have shown that the therapeutic effect could be achieved more rapidly by infrared coagulation and with less stress on the organism. The system can also be used to good effect in the event of bleeding following surgical interventions in the anal region, such as after the removal of papillary hypertrophies in the anal canal or rectal polyps after mucosal biopsies.

GYNAECOLOGY

Many women go to the doctor with vaginal discharge. Benign portio lesions are the most common cause of this phenomenon. In these cases the infrared coagulator provides a genuine alternative to cryosurgery and to thermo-coagulation with electrodes. The wound secretion and the general stress on the patient are minimal. The therapeutic concept of coagulation of benign portio and cervix lesions with infrared radiation broadens the possibilities of out-patient treatment in gynaecological practice.

ENT

Diffuse bleeding from wounds of relatively extensive area is not uncommon in ENT medicine. It is above all in fragile tissue that haemostasis – always aimed at even in the case of small vessels – often cannot be achieved by ligatures. The use of haemostasis has proved its worth above all for blood staunching after tonsillectomy. It has been found that the extent of the tissue destruction can be essentially better controlled and reproduced by means of the new coagulator. In this way haemostasis is possible with minimum accompanying necrosis. The possibility of using the technique in wet wound milieus permits surface treatment of the wound bed without any danger to the neighbouring structures.

Further areas of application are blood staunching after adenotomy, bleeding in inoperable malignomas containing many vessels, and also endoscopic blood staunching in the nose and the larynx.

Palliative destruction of tumours appears to be another possible application of the contact coagulator, this being currently at the stage of clinical tests.

DERMATOLOGY

The treatment of extensive haemangiomas on the body surface and of naevus flammeus can pose problems. Conservative modes of treatment, such as X-ray therapy, sclerosing injections, and therapy with corticosteroids are always encumbered with considerable

secondary damage and their outcome is uncertain.

Treatment with the coagulator is performed over several sessions, sometimes with a local anaesthetic and sometimes under short-term anaesthesia.

Further indications are the bleaching out of haemangiomas and the treatment of warts by surface coagulation, as well as removal of tattoos.

SURGERY

Bleeding parenchymal areas still represent a surgical problem. The inadequacy of the conventional methods is likewise reflected in the rates of mortality and complications of liver rupture as well as in the frequent necessity of removing the spleen just because its capsule has been very slightly damaged.

The infrared contact coagulator sets new therapeutic standards in such cases. Pressure of the applicator against the tissue simultaneously displaces the blood from the surface, compresses the bleeding vessels, and – depending on the duration of the IR-Light-pulse – a variable amount of energy is emitted into the tissue where it is absorbed, thus causing the coagulation. This process is continued in steps, and if necessary



Microscopic diagnosis immediately after coagulation: Surface-ulcer of 3 mm max. depth

repeated until a dry coagulation surface has been formed.

In the clinical applications of the coagulator to the liver, spleen, and kidneys tried out so far it was possible to achieve adequate haemostasis by superficial coagulation of the tissue surfaces.

DENTISTRY

Rapid blood staunching following extractions or other surgical interventions in the oral cavity in patients with disturbed or delayed blood coagulation is a further sphere in which the infrared contact coagulator can be used. For example, it can be used in anti-coagulation therapy, in low-grade haemophilia, or in coagulation disorders after the taking of analgesics. After removal of the gelatin sponge, the light guide is placed in the cavity left by the tooth and the light pulse is triggered. After lifting off the Teflon[®] tip, the bleeding is staunched and the cavity is sealed.

In this way, the infrared coagulator is also suitable for extractions in dental practice on a routine basis since the blood is staunched within a few seconds.

The light guide is sterilized by immersion in an upright vessel containing a sterilizing fluid.



LIGHTGUIDES

For use in all kinds of medical domains we supply a range of light guides of various lengths and diameters as attachments to the basic coagulator apparatus. The circumference of the necrosis produced is determined by the diameter of the light guide used. The light exit surface of the guide is protected by a replaceable Teflon[®] tip. This tip constitutes the contact surface and prevents the guide from sticking to the tissue.

SAPPHIRE CONTACT TIP

Nearly undestroyable. Better surface cooling than with a Teflon[®] tip, resulting in less carbonisation of the tissue and slightly deeper necrosis. Recommended for removing tattoos. Preferably used in surgery.



Quartz glass lightguides with diameters 2 mm, 6 mm, and 10 mm.
Handapplicator, spare lamp with goldreflector



Ø 2 mm, Ø 6 mm, Ø 10 mm
Teflon® or saphire tips

LITERATURE

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TECHNICAL DATA:

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|-------------------|---|
| Power unit: | |
| Mains voltage | 100/120/230 VAC |
| Frequency | 50... 60 Hz |
| Power consumption | 240 VA |
| Handapplicator: | |
| Lamp voltage | 15 V |
| Power | 150 W |
| "int" | 6 sec./60 sec. |
| Lightguide | available in Ø 2 mm, Ø 6 mm, Ø 10 mm Length: from 70 mm to 420 |
| mm | |
| Weight | approx. 2,8 kg |
| Protective Class | I, according to VDE 0750 (IEC 601/1) |

This equipment may not be operated in areas that are not explosion safe.

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