Microvascular bipolar coagulator

Technical note


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A bipolar coagulator fabricated from jeweler's forceps of various sizes is described. The unit has proved very useful in microvascular neurosurgical procedures that require high magnification.

KEY WORDS • bipolar coagulator • microvascular surgery

The usefulness and safety afforded by bipolar coagulation in neurosurgical procedures are amply documented. There are still many practical problems to be solved, however. One problem is the awkwardness of the bipolar coagulation forceps currently available for microvascular neurosurgical procedures requiring high magnification and precise hemostasis usually performed on surface structures.

This report describes a new bipolar coagulation forceps designed especially for the fine control needed in microvascular neurosurgical procedures.

Description of Instrument

Several jeweler's forceps made of stainless steel were obtained and evaluated for grasping balance by the surgeon. We have found the jeweler's forceps Inox, No. 3C* to be satisfactory. To minimize the problem of tissue sticking to the forceps during cautery, a 0.1-mm plating of silver was applied to that part of the forceps tip that is used to cauterize. Only the limited area of the forceps tip actually used in cauterization should be plated as it is difficult to insulate silver surfaces with Teflon unless it is done in an inert atmosphere. To avoid partial bypass of the current through adjacent areas which are bathed in electrolytic fluids a 0.1-mm coating of Teflon TFE S-3 was used to insulate the whole forceps except for the silver-plated inner tip.

The blades of the No. 3C forceps were separated at their base, a Teflon spacer was inserted between them, and a Teflon-insulated cable terminating in a GR (general radio) plug was attached to each tine. The stiffness of the forceps (force necessary to bring the tips together) can be controlled by the thickness of the Teflon spacer (Fig. 1). The instrument is 11 cm in length, 1-cm wide at its widest point, 0.5-mm wide at the tips, and weighs 15 gm.

*Inox forceps, No. 3C, manufactured by A. Dumont et Fils, Switzerland.
Discussion

The microcoagulation forceps described herein possess a distinct advantage over previous designs because they afford optimal manual control when working at high magnifications and a short working distance. They are especially useful in microvascular neurosurgical procedures such as anastomosing the superficial temporal and middle cerebral arteries. Teflon coating prevents current passing anywhere along the blade except at the coagulating tips.

We employ jeweler's forceps routinely in most microvascular procedures. They are ideally suited to manipulating small suture material under high magnification, dissection, and may even be used as needle holders in difficult situations. A coagulation forceps which serves all these functions obviates the need for changing instruments during delicate microvascular procedures.

References

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