Pressure-Irrigation-Suction System*

Technical Note

By

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With 2 Figures

Summary

The authors describe a microsurgical pressure-irrigation-suction system (MPIS) which allows a rapid adjustment of suction and irrigation to the operative situation by one-hand manipulation. This system is especially suitable for transsphenoidal microsurgery of pituitary disorders and has proved its usefulness in 60 such operations.

Introduction

Suction systems imply several problems which have been discussed in detail by Völlfors et al. (1980). Elimination of tissue and blood clots is difficult with small suction tubes as used in microsurgery. Therefore, complicated and expensive instruments with vibrating tips (Cavitron Ultrasonic Surgical Aspirator, Cusa®) or cutting tips (Biotome®) have been devised (Flamm et al. 1978, Lazar et al. 1978).

One possible solution of the problem has been brought forward by Bleasal and Harrison (1980), who constructed an irrigation sucker dissector. However, this device does not allow rapid and gradual adjustment of functions at the handpiece. To our knowledge, the size and form of this instrument makes its use in transsphenoidal surgery difficult. For this reason we continued our attempt to construct a pressure-irrigation sucker (MPIS) which allows quick adjustment of functions in one handpiece and which meets the needs of small operation fields as in transnasal surgery.

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Description of the Instruments

Fig. 1 gives an overall picture of the principal parts of the system. It consists of a handpiece (3) with suction-irrigation tube (1 + 2) and a fluid pressure generating system (11). The suction pump with connections to 8, which is regularly available in the operating theatre, is omitted in Fig. 1.

Fig. 1. Microsurgical pressure-irrigation-suction system. Pressure generator left side and handpiece for regulation of irrigation and suction right side. Explanation see text.

The suction-irrigation tube consists of a larger tube (2.5, 3, and 3.5 mm) for suction and an indwelling small cannula (0.8 mm) for irrigation, which ends 2 mm before the tip of the outer tube (Fig. 2).

In addition to a straight tip, a 90 degree angled tip is available, which can be plugged in and turned by 360° if desired. The suction-irrigation tube is easily fixed to the handpiece by insertion of the suction tube into 1b and of the irrigation cannula at 2a. The shape of the handpiece allows instant control of the two functions with one hand. Rapid fine adjustment of suction force or total cut off of suction is provided by pressing the knob (4) with the thumb.

The fluid pressure is preset by the screw at the handpiece (6). The fluid pressure is provided by a special pressure tank (11), which