Inexpensive easily-constructed cryoprobe

KENYON JONES

Bronglais Hospital, Aberystwyth, Cardiganshire

Worst (1968) has recently described a modification of Bellows's (1966) simple cryoprobe using pencils of compressed carbon dioxide snow as refrigerant. The instrument described here has evolved from this principle, but is easily constructed from readily-available materials.

Whilst subject to the same limitations as other cryoprobes of simple design it, nevertheless, removes a lens more efficiently than a forceps and may be of value as a standby instrument or to ophthalmologists working in areas where more sophisticated instruments are, for various reasons, unobtainable.

Construction of cryoprobe

The body of the instrument is a 2 ml. disposable syringe. The original probe was a copper nail filed and polished to the required size and shape to fit the barrel and neck of the syringe (Fig. 1), and this can, if desired, be fitted with a simple insulator of similar shape to a luer mount. The assembled cryoprobe is light and easily manoeuvrable (Fig. 2).

Preparation of carbon dioxide pencil

This is prepared in a similar manner to that described by Worst, but it was not necessary to construct a special chamber for the purpose. Instead, a device used by dermatologists for the treatment of warts, was found to produce a pencil of compressed CO₂ of similar diameter to the syringe barrel. One small individual CO₂ cylinder used with this device produces a pencil of 2 ml. volume which retains its freezing properties for about 10 minutes when used in a room of average temperature.

FIG. 1 *Probe shown in close-up*

FIG. 2 *Assembled cryoprobe*

FIG. 3 *Diagram of cryoprobe*

A device such as this, however, is not essential. Provided a means of making CO₂ snow is available, this can be loaded into the syringe and compressed *in situ* by the plunger, and this is now the method of choice in this hospital.

Sterilization

The probes are sterilized by any available method. The syringes are of a standard type pre-sterilized by gamma radiation.

Method

A theatre attendant prepares the CO₂ snow or pencil in an adjoining room during the early stages of the operation. This is dropped into the syringe and the plunger replaced; the instrument is then immediately ready for use. The lens is removed in the usual way.

As the pencil decreases in size, the plunger is correspondingly depressed, maintaining contact between the pencil and the base plate of the probe. It may be necessary to make a nick in the plunger to allow the gas to escape up the barrel.

A small spring inserted under the base plate (Fig. 3) provides a simple conversion for removal of dislocated lenses. The insulator can be introduced with the probe retracted by the spring.

When contact with the lens is established, the plunger is gently depressed, compressing the spring, and the probe is protruded to impinge against the lens.

The syringe wall has proved a quite efficient insulator and can be held in the unprotected fingers for the period of lens removal without undue discomfort.

Conclusions

Recognizing the limitations of a simple cryoprobe when tip-thawing is necessary, this instrument has certain advantages over more elaborate equipment:

- (1) Low cost
- (2) Complete reliability
- (3) Easy maintenance
- (4) Silence
- (5) Safety

It has the added advantage over other similar probes in that the duration of freezing time is under direct visual control.

Summary

A cryoprobe, easily constructed from readily-available materials, is described and its advantages over more sophisticated instruments enumerated.

My thanks are due to Mr. A. Cropper for the photographs.

A nickel-plated copper probe and an insulator will be produced by Messrs. C. W. Dixey and Son to fit all 2 ml. disposable syringes.

References

- BELLOWS, J. G. (1966) "Cryotherapy of Ocular Diseases", p. 33. Lippincott, Philadelphia
WORST, J. G. F. (1968) *Amer. J. Ophthalm.*, **65**, 587