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Short Communications

Temporal bone dissection using a low cost miniature electric drill

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Abstract
The performance of various specialized and general purpose drills was assessed for use in temporal bone dissection. The Minicraft MB120 and MB130 were found to be as effective as specialized drills but with greater convenience and much reduced cost. The use of these drills allows high quality temporal bone dissection to be performed on a limited budget.

Key words: Temporal bone; Middle ear

Introduction

Temporal bone dissection is an essential part of surgical training in otology. An effective high speed drill is a prerequisite for successful dissection but most specialist operating drills are expensive and it may be difficult to justify their use for this purpose. A survey of commercially available drills was performed in order to find an alternative drill. Three main types are available; compressed air drills, flexible driveshaft electric drills and micromotor electric drills.

Compressed air drills offer high top speed and torque with a relatively small lightweight handpiece and are commonly found in operating theatres. They are expensive and require a supply of air, the trailing pipe from this supply may restrict manoeuvrability. These factors rule out the use of such drills for dissection purposes.

Flexible drive shaft electric drills are relatively cheap but can be tiring to use due to the weight of the drive shaft. Top speed is limited to moderate levels but torque is good. These drills are commonly used for temporal bone dissection and several similar models are available e.g. the Normic 18000.

Micromotor electric drills have a small low voltage motor mounted in the drill handpiece and are light in weight and easy to manipulate with only a thin flex leading to their power supply. They have high top speed and good torque over the whole speed range. Some specialist operating drills e.g. the Stryker 'Command Series' and John Shea drills are of this type, but although they are effective in use their cost rules them out as dissection drills. Several general purpose micromotor drills are available at lower cost but the majority of these proved to be impractical as they have long cylindrical handpieces which do not taper at the tip e.g. the Royal 38L2 and Beaver 'Movac' drill. These drills obscure the view of the dissection and foul the objective of the microscope. Two drills, the Minicraft MB120 and its replacement the MB130 (available towards the end of 1993), do not suffer from these drawbacks. They were found to be nearly as effective as the specialist drills and were also by far the least expensive.

Minicraft MB120 and MB130 drills

The MB120 is shown in use in Figure 1. It has a separate low voltage power supply to eliminate risk of shock to the user. The speed control is on the front panel and the drill is operated by an on/off switch on its body. The burrs fit into a hand tightened collet. The drill is cooled by a fan and has shown no tendency to overheat in use. The best performance is provided by the MB750 power supply (shown in Figure 1) which provides electronic torque control, but the cheaper MB730 power supply is quite adequate. The MB130 drill is substantially the same as the MB120 but is smoother running with a more resilient mechanism, a higher torque and a wider although more comfortable grip. Its top speed is slower but overall the MB130 offers a distinct performance improvement.

The footswitch accessory for these drills, the MB0700, was recently deleted from the range and supplies will run out in due course. However many component suppliers have suitable switches if one is required e.g. Radio Spares stock no. 316 901,

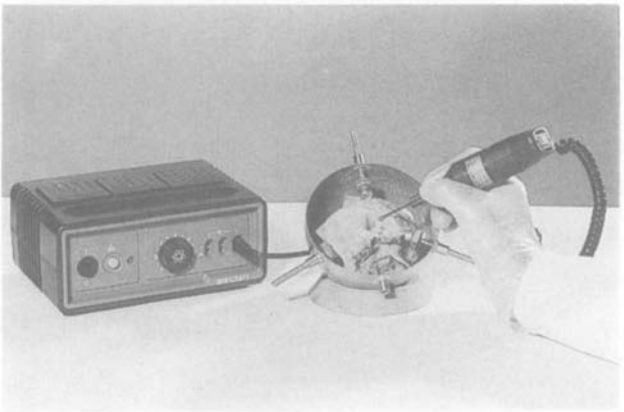

FIG. 1
The MB120 drill in use with the MB750 power supply.

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TABLE I
DETAILS AND SUPPLIERS OF DRILLS TESTED

Drill name	Drill type	R.P.M.	Approx. cost (ex VAT)	Supplier
Stryker 277–10	Compressed air	40 000	£1000	Stryker Ltd (0734 819991)
Stryker 'Command Series'	Micromotor	100 000	£1700	Stryker Ltd (0734 819991)
John Shea	Micromotor	40 000	£1500	C.J. Surgical (081 640 0993)
Normic 18000	Flexible driveshaft	18 000	£185	Skillbond direct (0494 448474)
Beaver Movac	Micromotor	35 000	£690	Skillbond direct (0494 448474)
Royal 38L2	Micromotor	30 000	£460	Skillbond direct (0494 448474)
MB120 or MB130 drill with MB750 power supply, MB0700 footswitch and MB1802 cable	Micromotor	24 000 to 30 000	£85	Mincraft Ltd (0388 423115)
Alternative footswitch for MB120 and MB130 stock no. 316 901			£10	RS Components Ltd (0536 201201)

which can easily be fitted by a technician to the low voltage output cable of the power supply. Extra cable with plugs fitted (item MB1802) should be ordered if routing down to a footswitch is required.

As these drills operate at high speeds it is essential that all burrs are free from eccentricity and are not of excessive length or the drill will run out of balance. Eye protection must be worn at all times. Details of drills and their suppliers are shown in Table I.

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