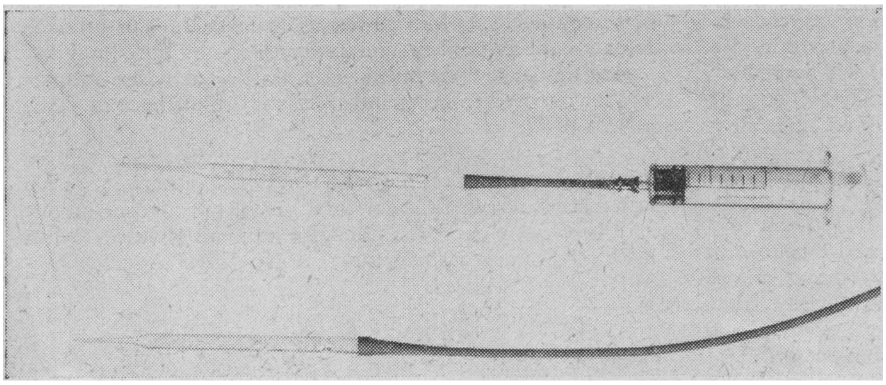
NEW APPLIANCES

Disposable Middle-ear Aspirator



Mr. N. SHAH, lecturer, Professorial Unit, the Institute of Laryngology and Otology, London W.C.1, writes: Myringotomy and aspiration of fluid from the middle ear is a common practice in otology. Children with fluid (serous or "glue") are operated on under general anaesthesia with the aid of a Zeiss microscope.

A glass suction cannula (see photograph) for aspiration of fluid from the middle ear can be made to any desired angle in the laboratory from a Pasteur pipette. A hole to control the suction is made on the side of the stem by blowing through the pipette when it is hot.

The material can be seen through the transparent end of the pipette, and can readily be transferred into a suitable container by expelling with a disposable sterile syringe connected to the pipette by means of a piece of rubber tubing with a Luer adapter.

Compression Clamp for Use in Fractures of the Tibia

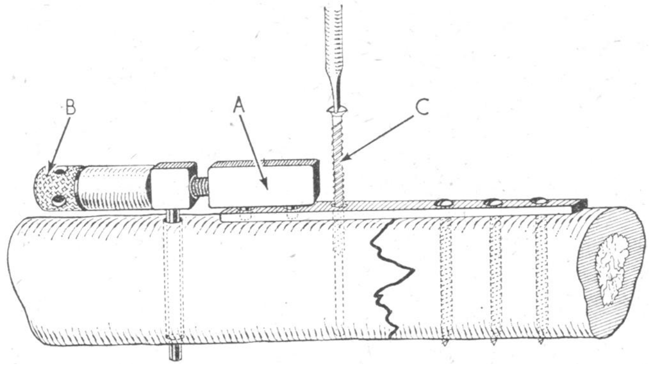
Mr. J. D. HAMER, surgical registrar, the Queen Elizabeth Hospital, Edgbaston, Birmingham 15, writes: Fractures through the shaft of the tibia are often treated surgically by using a metal plate as an internal splint, but delayed union may occur even when closed fractures are operated on. The frequency of unsatisfactory results is related to many factors, not the least of which is the technical problem of holding the fractured bone ends in close apposition.

Though Hicks (1964) maintains that rapid primary union is achieved by rigid internal fixation alone, a plate of massive dimensions must be used to prevent bending. For routine use it has been found that a plate of smaller physical size is more easily accommodated on the subcutaneous surface of the tibia, and the problem of maintaining rigidity has been overcome by the application of compressive stress during plating, combined with a below-knee plaster cast.

Whether or not compression itself of the fractured segments assists the union of cortical bone (Danis, 1949), as it does cancellous bone (Charnley, 1961), adequate compression of a fracture would appear a priori to aid immobilization. Though apparatus exists to do this (Muller, 1961) it is expensive and complex to use, and this has perhaps offered a deterrent to its more frequent use.

The instrument described below provides up to 80 kg. of compressive stress, measured in actual use, and is of low cost. Special plates are not required, those of the Sherman or Burns pattern being used routinely.

The instrument consists of the clamp shown in the illustration. It is attached to the bone on the proximal side of the fracture, about 1 in. (2.5 cm.) above the plate, by a $\frac{1}{4}$-in. (6-mm.) peg passing through both cortices. The clamp itself consists of a block (A) which engages with the upper two holes of the plate by means of two pegs. A screw attached to the block passes through the head of the anchoring peg and engages with a knurled nut (B) which is drilled radially, as shown.



Clamp in position showing its attachment to the plate and the first screw being inserted after compression.

In use the plate is first fixed to the distal fragment by its three screws. The clamp is attached to the proximal bone fragment and plate, as described above, and compression applied by turning the nut (B) in the required direction with a tommy bar. Compression is then maintained by inserting the screw (C) through the remaining hole in the proximal end of the plate. Finally the clamp is removed and the remaining two screws are inserted. Experiments on fresh cadaveric bones fitted with a system of strain gauges (Tinsley type) have shown that the clamp can produce a compression force of up to 80 kg. with a plate of conventional design—for example, Sherman or Burns. Maximum compression occurs in that part of the cortex underlying the plate, and was shown to occur also around about half the circumference of the bone. Tension stress occurred in the cortex at a point directly opposite to the position of the plate.

The apparatus described here is inexpensive, easy to use, and has been shown to provide appreciable compression across a fractured bone. From the ultimate tensile strength of bone (about 20,000 lb./sq. in.; 1,400 kg./sq. cm.) it may be calculated that a plate of cross-sectional area about $\frac{1}{2}$ by $1\frac{1}{2}$ in. (1.3 by 3.8 cm.) would be required to maintain, without bending, compression around the entire circumference of a bone the size of a tibia. This is clearly impractical, and the Sherman plate used in this equipment offers a satisfactory compromise. Preliminary clinical results on a small series of patients have been very satisfactory.

The compression clamp is being manufactured by the Zimmer Orthopaedic Ltd., 134 Brompton Road, London S.W.3.

I wish to thank Mr. J. C. Fulford for his advice and encouragement, and Mr. A. Wright, instrument curator at the General Hospital, Birmingham, who constructed the prototype instrument. I am grateful to Dr. D. J. White, of the English Electric Company, Whetstone, for his help in making stress measurements.

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