Col. C. A. WEBSTER'S vade mecum entitled *Regimental M.O.* contains little to criticize and much to commend. By combining brevity with a free and intimate style the author has managed to cover an amazingly wide field. Apart from its obvious value to the newly commissioned, many medical officers with long experience will welcome a handbook of convenient pocket size, reference to which may save wearisome search in A.M.S.Regs. or Standing Orders, R.A.M.C. The booklet is published at 2s. 6d. by A. Wheaton and Co. Ltd., Exeter, and royalties derived from its sale will go to the R.A.M.C. Comforts Guild.

Preparations and Appliances

REDUCTION OF LEG FRACTURES BY HYDRAULIC TIBIA TRACTION

Dr. J. E. STANLEY LEE, F.R.C.S.Ed., medical superintendent, New Cross Hospital, Wolverhampton, writes:

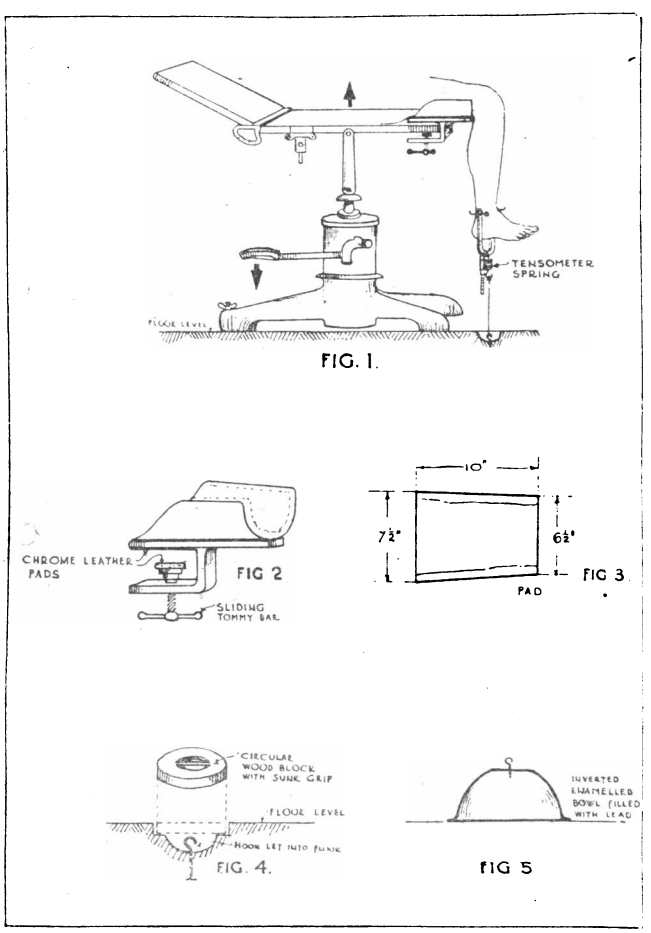
In fractures of the tibia and fibula overriding of the fragments is extremely common owing to sliding in oblique and spiral fractures and loss of apposition in the case of transverse fractures, and considerable difficulty is experienced in correcting the displacement and in maintaining good alignment. Manual reduction is often unsuccessful and, if swelling is marked, redisplacement occurs even despite a well-applied plaster unless continuous traction is also employed. In the new method here described reduction is accomplished by hydraulic tibia traction with the aid of an operating table equipped with an oil-pump base. Though primarily intended for skeletal traction, the method can also be used with strapping extension where displacement is slight or moderate.

Description of Apparatus

The apparatus employed consists of:

(*a*) An operating table equipped with hydraulic raising mechanism (Fig. 1).

(*b*) A thigh support (Figs. 2 and 3) in the form of a half-section of a truncated cone 10 in. long, made of sheet metal suitably padded, having a proximal diameter of 7½ in. and a distal diameter of 6½ in., and attached to a strong base with an angled extension piece which passes round the edge of and below the table, to which it is fixed by a screw clamp operated by means of a sliding tommy bar. At the proximal end the sides are cut away to enable the thigh rest to be used for adolescents and children. Chrome leather pads are fitted to the upper surface of the clamp and to the under aspect of the thigh support. The sliding tommy bar provides good leverage, enables the apparatus to be rapidly fixed in position, cannot become detached, and can be pushed out of the way so as to allow ample room for the surgeon's hand and the passage of plaster bandages. The space available between the edge of the apparatus and the back of the leg is not less than 4¾ in. The thigh rest incorporated in Watson-Jones's (1932) tibia traction apparatus, of which the above is a modification, can be used.



(*c*) A tensometer spring (Fig. 1) graduated up to 100 lb., as used by Farquharson (1942).

(*d*) A hook let into the floor (Fig. 4) or, alternatively, an inverted enamelled bowl filled with lead, with a hook inserted through the bottom of the bowl into the lead filling (Fig. 5), which in the case of a bowl of 10 in. diameter weighs approximately 75 lb.

Method of Reduction

A Kirschner wire (or other form of traction pin) is driven through the tibia 1 in. above the ankle-joint, and a stirrup is fixed to the wire (or pin). Next the tensometer spring is hooked to the stirrup and, at its lower end, attached to the hook in the floor (or weight) by a short length of cord (Fig. 1). The thigh is thus supported on the rest with the knee flexed to a right-angle and the limb hanging vertically in the line of gravity, in which position there is no tendency for the fragments to sag backwards, and while the plaster is setting the position of the foot can be controlled by the operator's knee and lateral displacement of the fragments corrected by his hands.

An assistant gently operates the foot pedal attached to the oil-pump base of the operating table while the tensometer spring and cord are held in position until tension is felt. Further elevation of the table by the assistant results in hydraulic traction being applied in the line of gravity. The limb becomes taut, and when the overriding has been fully corrected crepitus is felt by the operator, indicating that the fragments are now in apposition and traction is such that angulation is also corrected. Rotational displacement cannot occur if the axis of the wire is correct, and the toe and the patella consequently point in the same direction. The fragments are then locked against each other by strong lateral pressure of the operator's two hands. This is an essential step, without which accurate reduction cannot be accomplished. So strong is the traction that very firm lateral pressure is necessary. Antero-posterior and lateral radiographs are taken and, if position is satisfactory, plaster is applied.

Application of Plaster

A plaster-of-Paris slab is placed directly to the skin over the posterior aspect of the limb from the back of the knee to the toes passing through the stirrup. A thin pad of wool is placed in front of the ankle-joint; but if swelling has not yet taken place it may be advisable to use a thin wool bandage over the front of the foot and leg before the plaster case is completed by encircling bandages. While the cast is setting, strong lateral pressure is again maintained by the palms of the operator's hands, and as soon as the cast is hard traction is released, the knee straightened to 30 degrees short of full extension, and the plaster case then extended to mid-thigh.

Subsequent Treatment

In all unstable oblique and spiral types of fractures continuous traction is necessary for the first three to six weeks. The limb is supported on a Braun splint, and 10 to 15 lb. of weight suspended over the pulley, with the foot of the bed raised about 12 in. When swelling has subsided a new plaster case should be fitted. The limb is again held in the hydraulic tibia traction apparatus and the new plaster applied, completely unpadded, from the toes to just below the groin with knee-joint slightly flexed. When the plaster is set the Kirschner wire is removed. Radiographs are taken in two planes, and if alignment is not absolutely accurate it should be corrected by wedging the plaster case.

I am deeply indebted to the writings of Mr. R. Watson-Jones (1943), from which I have drawn freely and at length; to the Wolverhampton Borough Surveyor's Department for the illustrations; to Messrs. Guy Motors, Ltd., Wolverhampton, who generously made the thigh support to my design free of charge; and to Mr. McGowan for the weight. Messrs. Down Bros., Ltd., London, have kindly undertaken to manufacture and supply the complete apparatus.

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