TRACTION BY ELASTIC TENSION FOR FRACTURED FEMUR

BY

W. REGINALD WILSON, M.A., M.B., B.Ch.

The following observations are based mainly on ambulance study and practice at a first-aid post. It is hoped that they will prove at least interesting to others who have or may have the care of accident cases.

Concerning the application of traction to a limb for the correction of overriding of broken fragments of bone, both the methods in common use for the femur have defects inherent in them which seem to call for remedy. The more simple one, as done in ambulance work, consisting of a bandage around the ankle, pulled tight to the lower end of a Thomas splint, falls short of the ideal in the smallness of its range of action. No sooner have the muscles begun to relax than it ceases to pull. The gradual and progressive reduction of overlap, instead of proceeding to completion, comes to a dead stop, and the most that can now be looked for is that the very small degree of restitution obtained shall be preserved. The method of extension by a weight suspended over a pulley, on the other hand, exerts its influence over far too great a range. It pulls as long as ever it is allowed to remain so attached and unrestrained; and not only so, but the pull remains as strong throughout the process as it was when first applied. The broken ends may therefore be drawn out of contact with each other and hope of union prejudiced.

Method of Applying Elastic Tension

What is now suggested is the use of elastic tension as the means of applying the force. We have used circular bands cut squarely from damaged air tubes from the tyres of motor-bicycles or motor-cars. A reasonable degree of precision can be obtained by calibrating them against a spring balance of the tension kind with a foot-rule. (If the splint is too short for this added length a board can be fastened to project

beyond the end, and attachment made to it.) We first decide how many pounds of pull we wish to remain in the part after reduction of the displacement. Having attached the band or bands to the loop round the foot, we pull the other end towards a stud or hook at the further end of the board. The elastic is given the amount of elongation we had found by measurement beforehand to correspond with the tension we desire—7 to 10 lb., for instance—and there should then be superadded an amount of stretch equal to the amount of shortening of the bone, as ascertained originally by comparison with the sound limb. If the tension corresponding with this amount of stretch seems unreasonably great or small we must either add to or diminish the strength of our elastic element, in which case we shall of course have to set our basic tension afresh, especially as this is the one we must be the more particular about. It has been found that an abnormally strong wrist is not needed to obtain a pull of even 40 lb.

The weak point about this rig is that if muscular spasm should recur so also will the displacement, together with its distressing self-aggravation and pain. This can be provided against by tying a cord alongside the elastic to withstand the

jerk without yielding—a measure that is imperative if further transport is in contemplation. This action can, however, be made automatic by means of a ratchet and pawl, as shown in the figure. Any handy metal-worker can make the essential part, and a carpenter the mounting, which slips on over the end of the splint.

This method is recommended as affording a simple means of correcting displacement from a very early stage and maintaining the position until a Hodgen or other good splint can be applied which allows of flexion of both hip and knee and does not interfere with nursing duties.

Another suggested use for elastic bands is in cases of operation on the chest—for example, breast—where an equable pressure is desired without restraining respiratory movements.

PROTECTION OF GLASS IN HOSPITALS

The Research and Experiments Branch of the Ministry of Home Security, in a memorandum on the protection of glass in hospitals, mentions three ways in which the scattering of glass in vertical windows can be reduced: (1) by covering the windows with wire netting of 1/2 in. or smaller mesh fixed to detachable frames; (2) by covering them inside with light-weight screens, which will cause the broken glass to fall close to the window; (3) by covering the glass with what the memorandum terms anti-scatter material. There are four ways in which this last can be done, and the memorandum gives them in the order in which they are most effective. (1) Strong textile netting or other fabric stuck firmly to the glass. This is best applied with a preparation insoluble in water, such as varnish or lacquer, and if an extra coat of varnish is given after the first is dry the whole can be wiped down with a damp cloth if it should get dirty in use. If paper is used it should be thick and tough; "criss-cross" strips are not recommended. (2) Cellulose film with varnish or lacquer as a waterproof coating; if cellulose acetate is used a special adhesive is required. (3) Strips of material not less than 1 1/2 in. wide and spaced to give not more than 6 in. of clear glass between the strips. (4) Liquid coatings, but these are not expected to be effective on panes of more than four square feet. Many preparations, some including rubber latex, are on the market, but hospitals are warned against accepting the unauthenticated claims of the advertisers. Some of these preparations are unreliable from the start, states the memorandum, some are useless in ten days, and few have survived three months' exposure. Advice on them can be obtained from the Building Research Station, Garston, Watford. Supports underneath glazed roofs, across the glass at about two-foot centres, will help to keep fractured glass in place, particularly if it is wired; wooden battens about 1 by 1/2 in. securely fixed to the glazing bars will also serve. Similar support can be given to glazed roofs by wire netting close to the glass. Temporary weather protection after the fracture can be secured if the glazing is covered externally with a suitable hessian-bitumen treatment. All glass in operating theatres except that in utensils and suspended light fittings should be removed. Window openings should be completely bricked up or wholly barricaded, and any roof light opening should be covered by concrete slabs or sandbags on timber. If the operation light is a single freely suspended unit fracture of the glass is not likely, especially if the window openings are bricked or barricaded. Copies of the memorandum can be obtained from the Research and Experiments Branch, Ministry of Home Security, Forest Products Laboratory, Princes Risborough, Bucks.

Huquette Meslin (*Thèse de Paris*, 1940, No. 62), who records two cases in infants aged 4 and 5 months respectively, stresses the rarity of primary purulent meningitis due to organisms of the typhoid group, the condition being even rarer in the infant than in the adult. The prognosis is almost always fatal and treatment unavailing. In both Meslin's cases the symptoms were those of meningococcal meningitis, but *Bact. typhosum* was found in the cerebrospinal fluid in one case and *Bact. paratyphoid* B in the other. Both were fatal. Necropsy was not performed.