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A NEW, ADJUSTABLE IRON CROSS BAR

To be Used in Plaster Casts

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In my description of the method of treating hip flexion contracture (Anthonsen 1966), an adjustable iron cross bar is mentioned. For several years in our department, this bar has proved to be so useful that details of construction and use may interest other surgeons.

In the common type of double spicas and half spica a wooden spreader bar is ordinarily used (Bleck et al. 1956, English 1957, Watson-Jones 1960, Ullmann 1950).

Especially in cerebral palsy surgery the locking of the extremities in plaster casts with a wooden bar connecting the two extremities is a hindrance to physical therapy for a long time.

Recognizing the importance of early physical treatment after operations in these cases, I developed an iron cross bar to be used in plaster casts from the groin to the toes.

The iron cross bar has the following advantages:

(1) *It can be removed*, which means that the patient can start exercises of all hip muscles soon after operation.

(2) *The degree of abduction may be adjusted* by telescoping the two parts of the bar. Asymmetric abduction, as described by Sir Reginald Watson-Jones (1960), may be established as well.

(3) *A continuous, dynamic, adjustable rotation power* may be applied, on both sides or separately on one side, if desired.

(4) *It can be fixed to the sole of long plaster casts*, open in front so that the extremities may be taken out for exercises.

MATERIALS

Thickness of the different iron plates and the lever is 3 mm. Outer diameter of the socket 20 mm, inner diameter 18 mm. Length of the plate to be fixed in plaster 130 mm, width 60 mm. The distance between holes in the telescoping bar is 25 mm. The bar is made in two sizes. The small model has a minimum length of 245 mm between the hinges, while the maximum length is 400 mm. The big model has a minimum length of 400 mm and a maximum length of 575 mm.

A coating of Rilsan (Nylon) on the plates and the lever is a good protection against rust and makes cleaning easier. The cross bar should be coated with hammertone finish. Silicone lubrication of all mobile parts is useful.

DESCRIPTION

The iron cross bar has 3 components: a socket for each leg and a connecting bar.

In Figure 1 the iron cross bar has been taken apart to show all of the parts. The *socket* attached to a *lever,* which is connected with a *foot-plate* by a *hinge,* makes it possible to change the direction of the socket according to the degree of abduction and the size of the patient. The position is secured by means of the winged screw. *The telescoping cross bar* has two parts so that the length may be changed according to the size of the patient and the abduction required.

Near the ends of the bar is a *hinge.* There are two rows of holes in

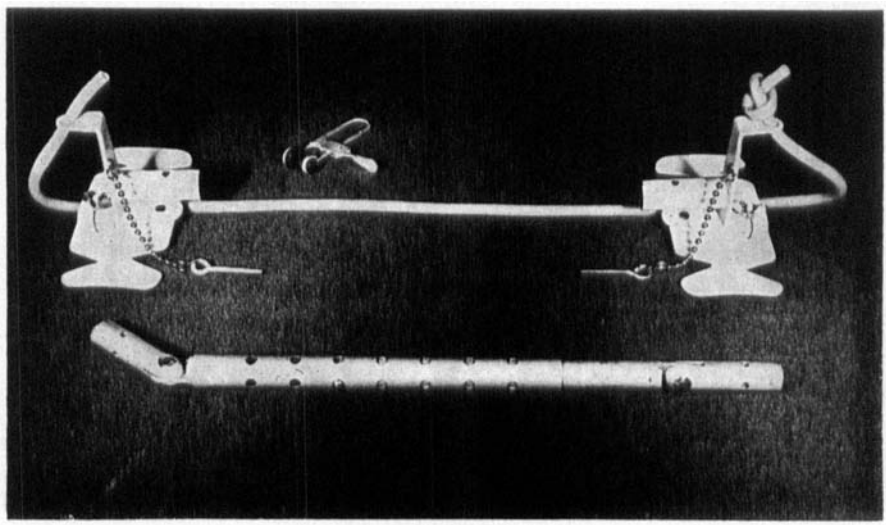

Figure 1.

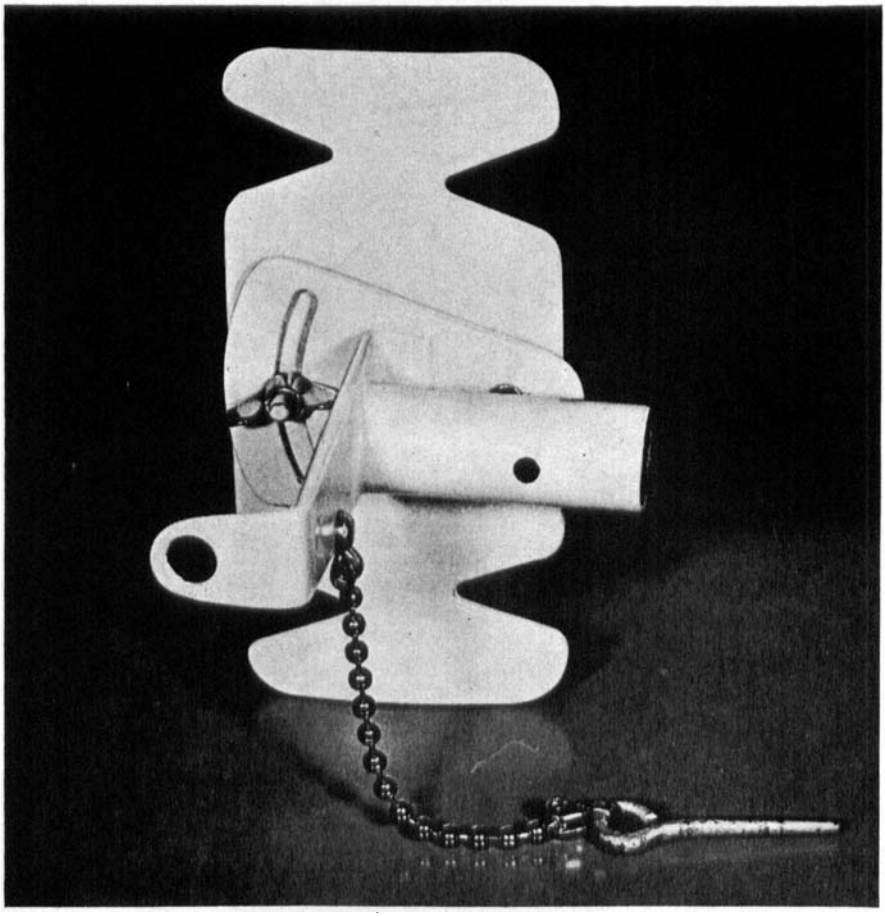

Figure 2.

the bar placed in such a way that the release of a *spring* makes it possible to rotate one part 90° and fix it to the spring again.

When the bar is put into the socket it is fixed by *a split pin* in one of the *two holes* running transversely through the end piece of the bar, determining the direction of the axis of the hinge in the bar.

Figure 2 shows details in the two parts which are to be fixed in the plaster by the foot plate so that the rotation of the foot plate of the lever is not affected. You will find the *hinge* which permits the mobility of the *lever* with the socket, the small split pin running through the hole in the end of the bar. In the lever is seen the hole for the rubber tube.

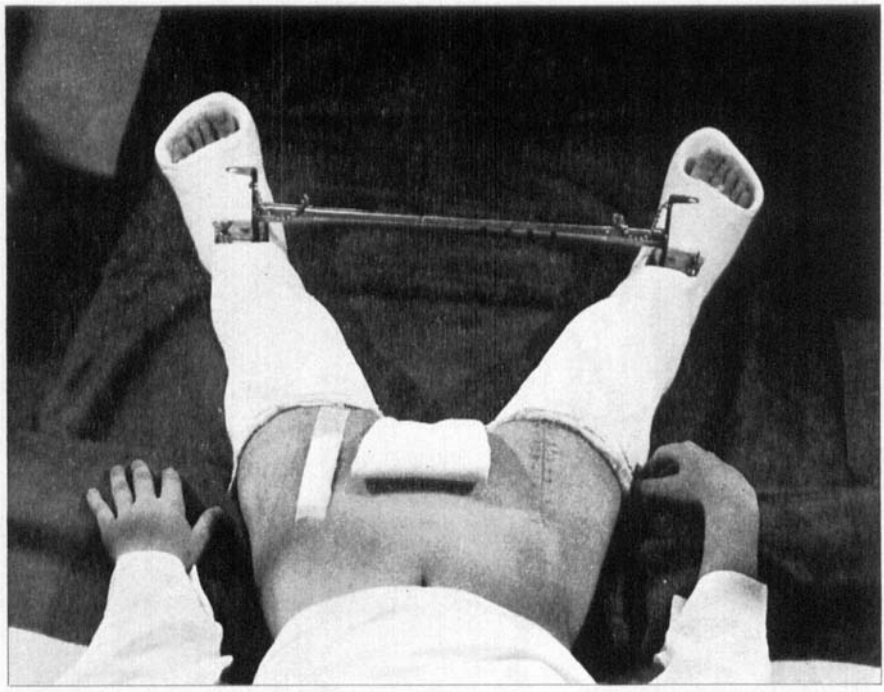

Figure 3

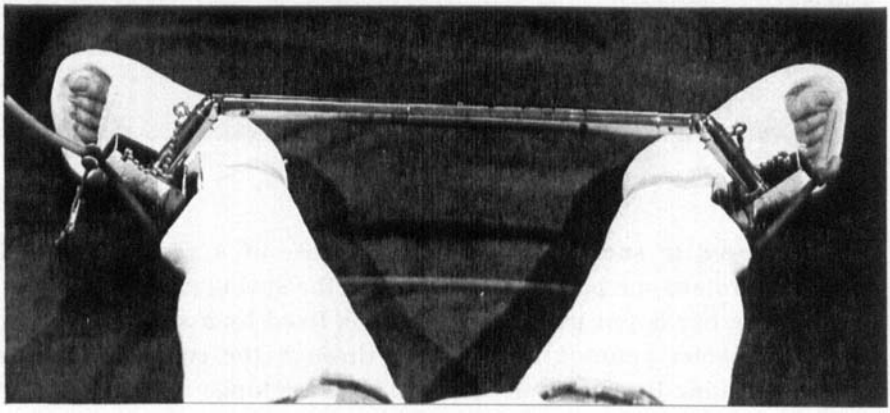

Figure 4.

The figure shows the socket in neutral position.

Some of the different possibilities are shown in the following figures:

Figure 3 shows the cross bar keeping the extremities in abduction,

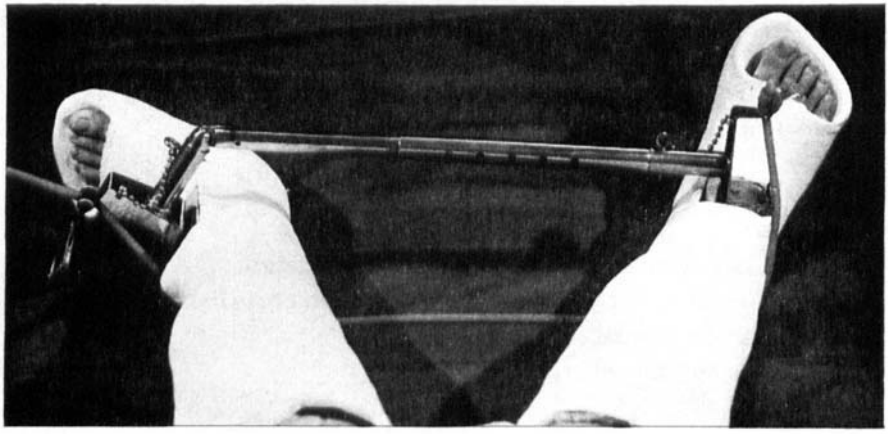

Figure 5

middle rotation. The bar is put into the sockets and fixed by the split pin in such a way that the axis of the two hinges near the end of the bar is at a right angle to a frontal plane. This makes rotation impossible.

Figure 4 shows the cross bar rotated 90° in the sockets so that the hinges in the bar permit an outward rotation of both legs by means of the rubber tube. The rotation power may be increased by tightening the rubber tube.

Figure 5 shows one part of the bar rotated 90°, which means that the left may be outward rotated when the axis of the hinge is parallel to a frontal plan while the right axis is vertical to the frontal plan, thereby preventing rotation.

DIRECTIONS FOR USE

(1) A good plaster cast from groin to toes on each side. A thin stockinette is useful.

(2) On the front side, just above the ankle joint, fix the foot plates with plaster bands (Figure 2) leaving free rotation for the foot plate of the lever. Release the winged screw, so that the socket is mobile. Put the cross bar into the socket in the desired direction, fix it in the socket with the split pin and lengthen the bar by releasing the spring, fix it again in the desired abduction and fix the foot plate of the lever by means of the winged screw.

Finally apply the rubber band through the holes in the lever,

a knot on one side, a clamp on the other side, tighten it as much as you want and the patient's reactions permit.

(3) When cross bar and sockets are removed they must be carefully cleaned and lubricated to be ready again for use.

SUMMARY

An adjustable iron cross bar is described in detail.

Several advantages over the ordinary wooden cross bar are mentioned.

Materials are described.

Directions for use are given.

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