

# The Halo-Girdle Orthosis Application

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## INTRODUCTION

After twenty-five years of use, the Halo has proven to be an effective instrument for spinal stabilization.<sup>1,2,4</sup> It is now widely used throughout the nation and in twenty foreign countries.<sup>10,11</sup> Many variations have arisen yet the principle of stabilization has not changed.<sup>3,5,6,7</sup>

In June of 1973, O'Brien, presented the "Halo-Hoop" for total spine fractures.<sup>11</sup> The Halo-Girdle followed this as an alternative to using pins through the pelvis. Alternatively, the Halo-Vest,<sup>9</sup> introduced in 1970, is primarily used for unstable cervical spine fractures and is the most frequently used halo unit. Since its advent, many articles have described its advantages over the first unit fabricated at Rancho Los Amigos Hospital in 1956.<sup>8,9,13,14</sup>

At present, the girdle is used instead of the vest when stability is required for special situations such as the following:

1. Thoracic spinal fracture together with cervical spinal fracture.
2. Fractured ribs, as well as spinal fractures.
3. Open wound about the chest area together with spinal fractures.
4. Presence of a thoracic spinal tumor to be stabilized by external fixation.

This article describes the step-by-step procedure for applying the Halo-Pelvic Girdle and several of the problems which can occur with its use.

## Description and Application

Figure 1 shows the plastic portions of the girdle. Figure 1A shows the anterior outer plastic portion, B, the posterior outer portion and C, the plastic liners with sheepskin in place. The sheepskin is se-

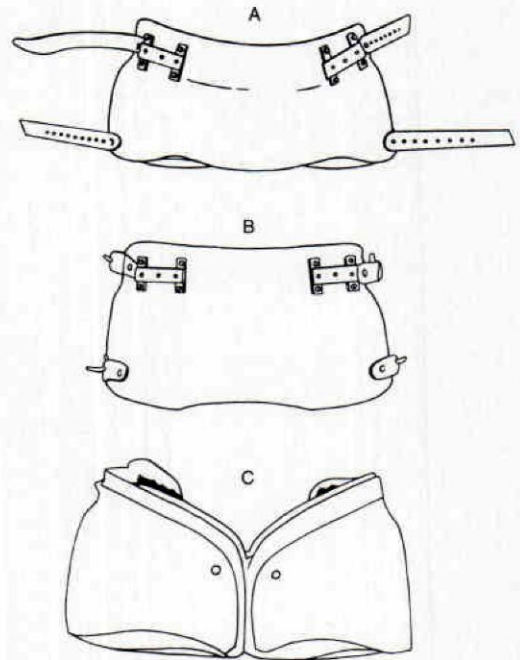


Fig. 1. (A) Anterior portion (B) Posterior outer portion (C) Both anterior and posterior portions in place with liner.

cured to the plastic liners with velcro for easy replacement.

The posterior portion of the girdle is put on first (Figure 2). This can be done by rolling the patient or raising the buttocks area to get the girdle well-seated while keeping the spine centered. The patient is

rolled back to the full supine position so that plastic liners with sheepskin can be inserted on both sides. There is a red line cut into the liner to show when it is at the midline of the body. The anterior portion is then put in place and strapped to the posterior portion (Figure 3).

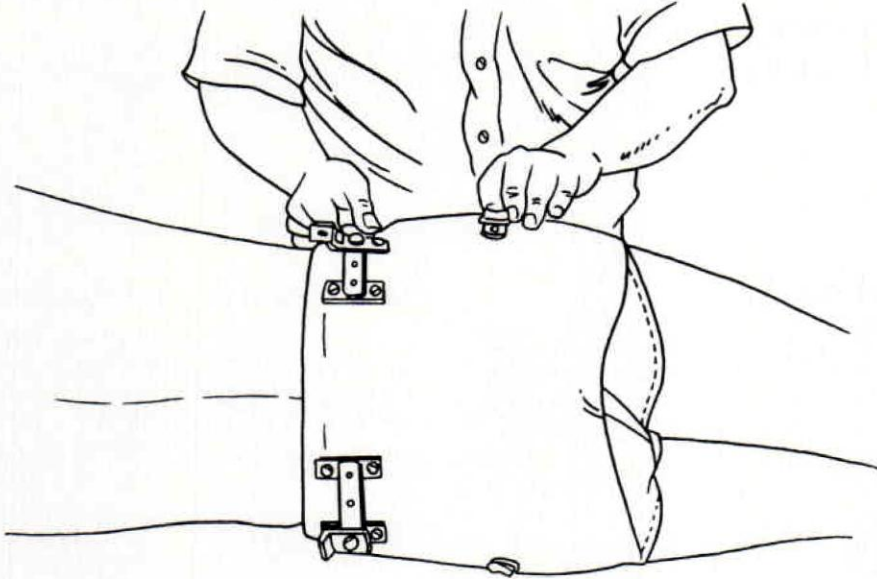


Fig. 2. Application of the posterior portion is done first by either rolling the patient to his side or elevating buttocks (note: centering girdle with respect to the spine is essential).

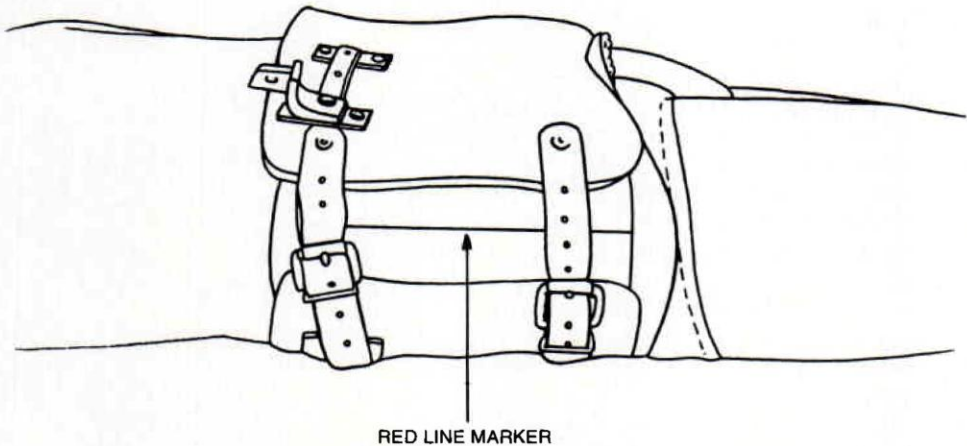


Fig. 3. Anterior portion is secured to the posterior with straps. Sheepskin liner is marked with a red line showing midline.

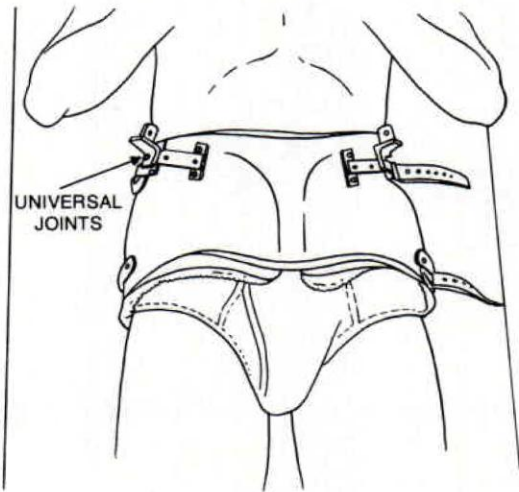


Fig. 4. Anterior view showing attachments of universal joints to two stainless steel brackets.

Figure 4 shows the full anterior view with the universal joints (A) attached to the two stainless steel brackets. It should be noted that the sheepskin does extend below the girdle to give padding for the sitting position. Figure 5 emphasizes that there must be at least 90 degrees of flexion range clearance for sitting which is cut into the anterior portion of the girdle and liner. In Figure 6, the posterior upright stabilizer bars (A) are then coupled to the right angle bars (C) with a clamping block (B) to gain proper length for over-the-shoulder clearance. When the patient has a barrel chest, the straight upright bars sometimes have to be contoured to clear the lower border of the rib cage (D). Both posterior upright stabilizer bars are shown here with one already attached. The unattached side is laid alongside to obtain the proper length before attaching it on the other side.

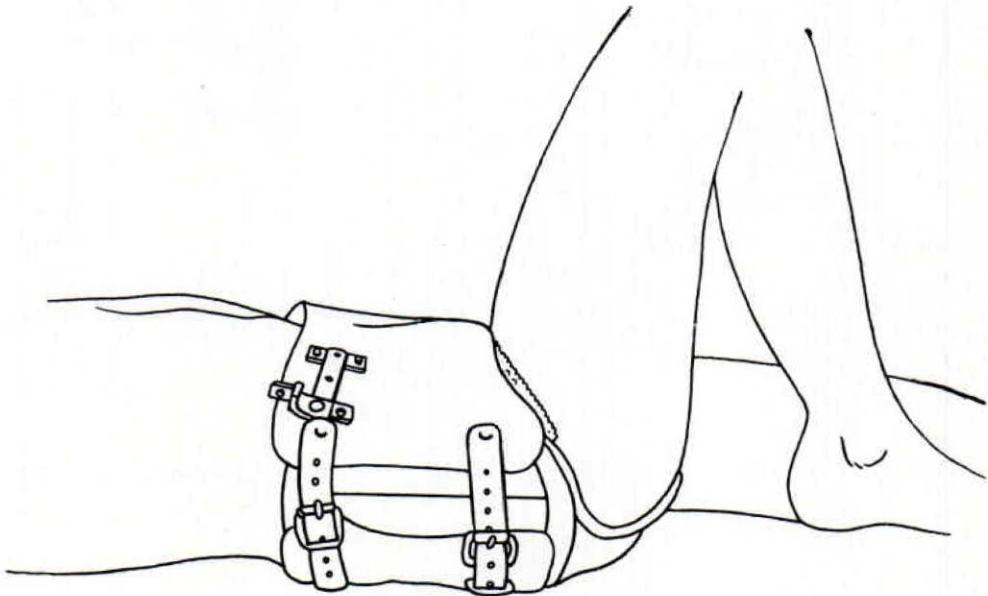


Fig. 5. Ninety degrees of hip flexion must be allowed in the girdle.



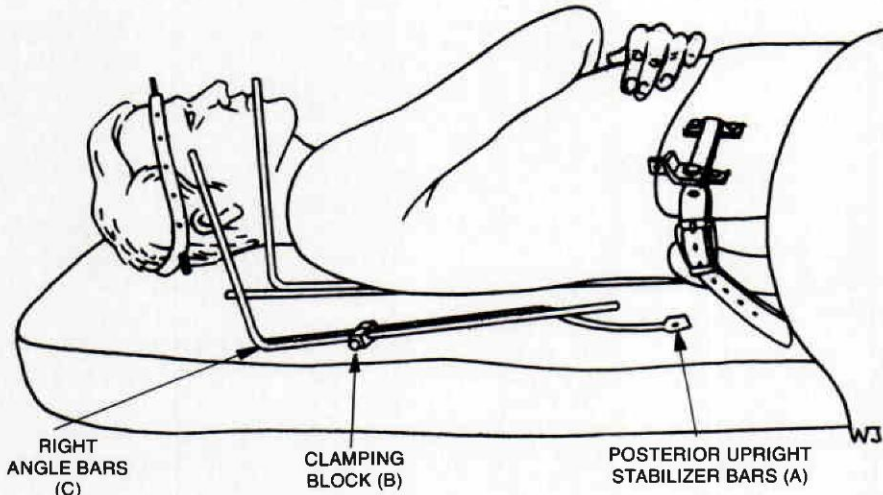


Fig. 6. Posterior upright stabilizer bars are coupled to the right angle bars to gain proper over-the-shoulder clearance.

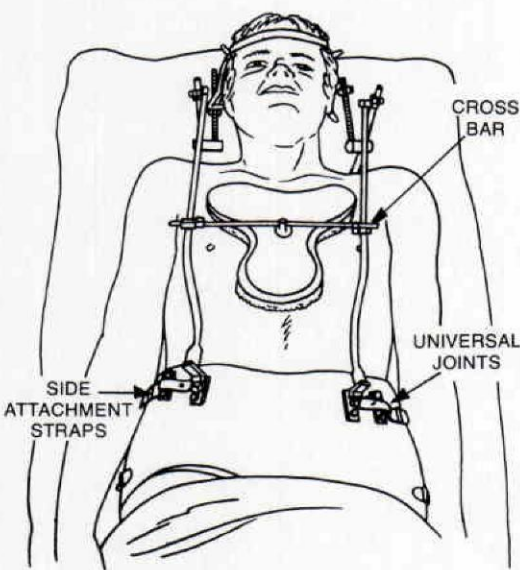


Fig. 7. Upright bars may need to be contoured to avoid contact with body.

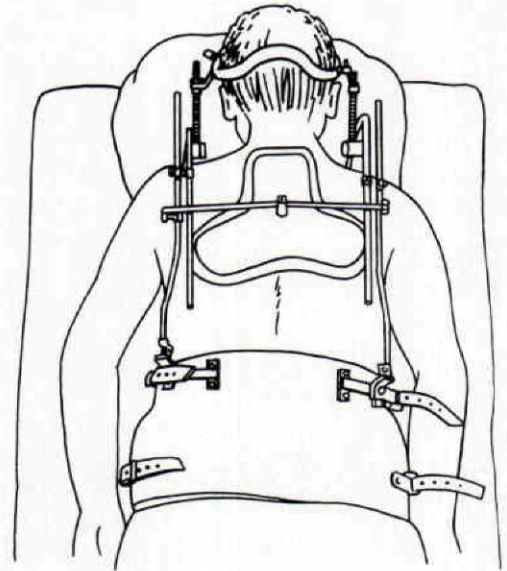


Fig. 9. Positioning of the posterior pad (note: adjustability in all directions).

Figure 7 shows the anterior view. Note the upright bars are bent out to avoid contact with the body, although this does not

always have to be done. The anterior chest pad is shaped differently from the posterior pad seen in Figure 9.

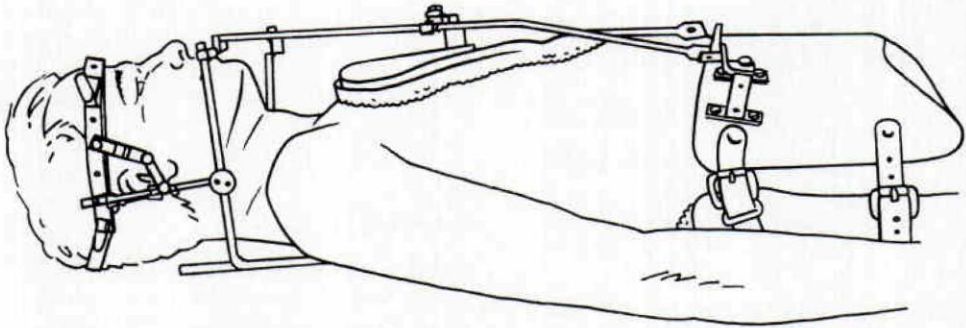


Fig. 8. Position of the anterior chest pad with relation to height and amount of space between the chest and pad.

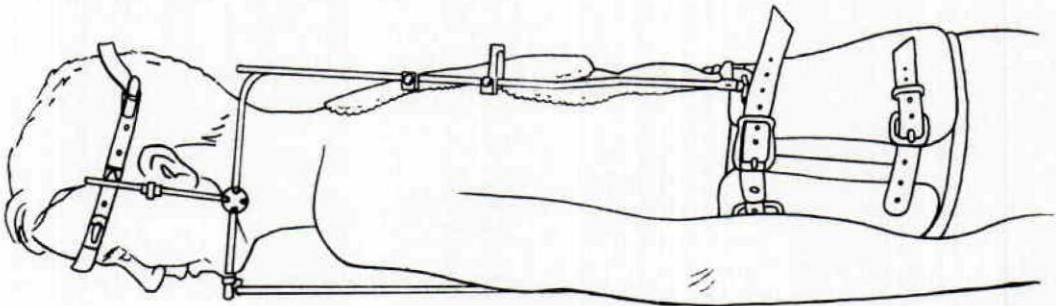


Fig. 10. Lateral view showing placement of the posterior structures.

The lateral view (Figure 8) shows the position of the anterior chest pad; i.e. the height and the amount of space between the chest and pad. There must be enough clearance for the patient to expand his chest, but not so much as to compromise stability. To gain this clearance the cross bar can be contoured (Figure 7).

Figure 9 illustrates the posterior view of the halo-girdle unit, and particularly the posterior pad. This pad can be moved up or down and even turned upside down according to the patient's needs. The clamping blocks for the two upright bars can be placed anywhere on the uprights so as not to cause pressure on the body (Figures 6B, 9 and 10).

Figure 10 is a lateral view with the patient in the prone position to demonstrate more clearly the posterior structures. Figure 11 illustrates the manner in which the halo ring is joined to the lower assembly and how the flexion-extension adjustment is secured to the threaded upright and the halo ring.

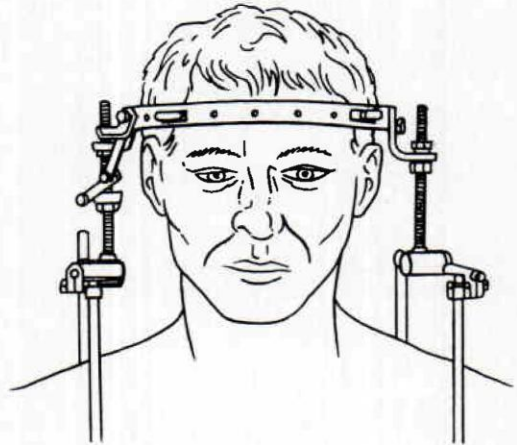


Fig. 11. Attachment of halo ring to lower assembly.



## COMMON PROBLEMS WITH THE HALO-GIRDLE

1. The anterior section presses into the thigh when sitting (Figure 5).

Solution: Trim the anterior brim and liner to allow for sitting.

2. The clamping block on the posterior uprights causes pressure when recumbent (Figure 6).

Solution: Bend the uprights at the base to achieve clearance for the bars from the body. The clamping blocks can be moved upward or downward until freedom from pressure is achieved.

3. Too much or not enough pressure is transmitted by the anterior and posterior chest pads.

Solution: The cross bars (Figures 7, 8, 9, and 10) need to be contoured outward or inward to give the proper clearance. The set screws must then be tightened to assure the space is maintained

4. Skin care under the pelvic portion of the brace.

Solution: The pelvic girdle units can be disassembled by sections for cleaning and inspection of the skin. Skeletal traction is not lost when taking the pelvic section down for skin inspection. For example: With the patient supine, the two bolts that attach the uprights to the anterior outer portion of the girdle (Figure 7A) can be removed, the straps unfastened, (Figure 7B), the anterior piece removed, the liners slipped out (Figure

3A) and then care can be given to the skin. This can be done in the prone or supine position without losing traction on the spine as long as only either the anterior or posterior uprights are loosened at one time.

## CONCLUSION

For the patient with multiple spinal injuries or with associated chest injuries, the halo-girdle is an excellent alternative to the plaster body cast for external immobilization. Use of this brace allows early ambulation, excellent skin care, and little restriction of chest excursion.

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