The Milwaukee brace for treatment of scoliosis

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In 1946, Blount and associates developed the first prototype of the Milwaukee brace for the nonoperative treatment of patients with scoliosis. Until that time, a large number of braces and corsets had been used for treatment of scoliosis; the results in most instances were far from satisfactory and in fact were generally so poor that it was almost universally agreed by orthopedists that the only treatment for scoliosis was surgical fusion.

Largely due to the ideas of Blount and associates and to the establishment of Milwaukee brace centers throughout the United States, we can now offer many patients definitive care for their scoliosis without surgery. The advantages of the Milwaukee brace are many: It allows the patient “active” correction of the scoliotic deformity, it allows freedom of motion and rarely interferes with social activities while treatment is going on, the cosmetic appearance of the brace when worn under the clothing is not displeasing, the brace can be removed for brief periods to allow skin care, kyphosis or roundback can also be well treated by the Milwaukee brace, and both scoliosis and kyphosis can be corrected at the same time.

Ambulatory, nonoperative treatment of the patient with scoliosis requires an interested orthopedic surgeon with specific training in the use of the Milwaukee brace, an efficient and experienced brace maker, a well-made brace, and close cooperation by the patient and family.

The principles governing the use of the brace include: (1) Replacement of the “chin pad” by Blount’s new “throat mold” (Fig. 1). The mold does not distract the head but gently keeps the occiput centered over the occipital pad. No bite deformities occur because no distractive forces are used. (2) Adjustable pressure pads placed, with radiologic control, over the ribs to direct pressure to the apex of the curve in the thoracic and lumbar regions. These curves change during treatment so that it is necessary to readjust application of the pads; serial radiographs are taken at appropriate intervals. (3) Wearing of the brace generally 23 hours a day. The patient is allowed to remove the brace for approximately one hour for skin care. During the summer, the patient may be permitted to spend a slightly longer period in a swimming pool. (4) Encouragement of most types of activities while wearing the brace. Many children are able to play tennis or ride a bicycle. Contact sports are discouraged, not because they may injure the patient, but because the brace may be injurious to other players. (5) Alternation of rest periods and exercise when the brace is worn. The patient is instructed in specific breathing and postural exercises in and out of the brace. (6) Continuous use of the brace until the patient is skeletally mature, which in girls is usually about age 16 years. Use of the brace is then gradually discontinued until eventually it is worn only at nighttime, usually until the patient is 17 or 18 years of age.

Recently, Moe pioneered in the use of thermoplastic material for construction of the Milwaukee brace. The material is lighter in weight and seems to be superior in many ways to the previously used leather and Monel metal. The thermoplastic material is
Fig. 1. This patient is wearing the new "throat mold" which does not cause distraction and merely pushes backward on the throat and holds the head against the occipital pad. There is no upward force distributed to the jaw or teeth. The patients also like the "throat mold" because it is easily concealed with a scarf.

The only problem encountered with the use of thermoplastic material is that after approximately 12 to 18 months of use, the material tends to crystallize; fissures develop between the holes, leading to large splits. However, most patients by this time require a new pelvic girdle because of growth. No other serious complications have been reported, nor has there been any occurrence of allergy to the thermoplastic material. Most patients are urged to wear the brace over underclothing so that it is not in direct contact with the skin; sweat is thus absorbed directly by the undergarments. Excellent results using the thermoplastic material for the pelvic girdle have been obtained in a series of over 100 patients at the Columbia-Presbyterian Medical Center (Fig. 2).

The Milwaukee brace has proved its worth in the conservative management of spinal curvature in many well-defined clinical situations. Among these is the idiopathic curve that is progressive but still acceptable in a patient just prior to maturity, which can be held and improved until maturity takes place. Many of these deformities can be corrected by as much as 40 to 50 per cent, and this dynamic correction is maintained while the patient is ambulatory. Second, the brace can be used in the early convalescent stages of poliomyelitis and other paralytic diseases, such as paraplegia due to spinal injuries. In these patients, the brace acts in a more passive capacity, but can hold the spine until maturity takes place or until surgical fusion can be effected. Third, the brace can be used while other factors contributing to scoliosis, such as pelvic obliquity and unequal leg length, are overcome by other surgical techniques. Fourth, congenital scoliosis can be controlled, and in many instances surgery can be prevented by strict adherence to the basic principles laid down by Blount and associates. In other instances, surgery for congenital scoliosis can be delayed for several years until the skeleton is more mature. The Milwaukee brace can also be used in most patients who have severe scoliotic deformities which are not amenable to surgical correction because of an underlying disease such as a malignant tumor or other associ-
of spinal deformities is our ultimate goal, since prevention is still better than cure. However, a new thermoplastic material has been marketed over the past several years for bracing and splints in the treatment of scoliosis. There have been no serious complications or difficulties in its use and patient acceptance has been high. In addition, since the "throat mold" has replaced the chin pad, dental deformities are no longer a problem.

The new Milwaukee brace made by an experienced orthotist and coupled with corrective exercises both in and out of the brace can provide a high percentage of excellent nonoperative results in the treatment of scoliosis.

REFERENCES


Hypertrophic gastropathy
(Menetrier's disease)
in childhood

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Protein-losing gastroenteropathy may be associated with a large variety of lesions of the gastrointestinal tract. Abnormal gastric protein loss is a well-known phenomenon in adults; however, it has rarely been documented in children. In 1964, Pittman and associates described a 5-year-old boy with transient gastric mucosal hypertrophy and hypoproteinemia in whom they demonstrated increased gastrointestinal protein loss. This report describes a child with a similar disorder who apparently recovered completely as indicated by return of serum protein values to normal and by disappear-