

GEHRUNG (E.C.)

IMPROVED

Plaster of Paris Jacket,

—OR—

“CUIRASSE,”

For Posterior Spinal Curvature in the Middle
and Upper Dorsal Regions.

BY EUGENE C. GEHRUNG, M. D.

ST. LOUIS.

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IMPROVED PLASTER OF PARIS JACKET, OR
"CUIRASSE" FOR POSTERIOR SPINAL CURVA-
TURE IN THE MIDDLE AND UPPER DOR-
SAL REGIONS.

BY EUGENE C. GEHRUNG, M. D., ST. LOUIS.

Read in abstract before the Medico-Chirurgical Society of St. Louis, April 12th, '80.

IN 1876, while attending Mrs. W., she asked me whether I could not do something for her son, who was the subject of posterior spinal curvature, and who had been for some time under the care of various physicians and surgeons without receiving much, if any benefit. The lady supplied me with the following history:

John, aged six years, was a healthy child up to the age of three years, when he had an attack of pneumonia, afterwards sore mouth and running ear. His mother thinks the otorrhea was checked too rapidly, on account of which the child became afflicted with a "disease of the eyes," lasting about two years. His eyes getting well, his gain became gradually worse until the spinal disease was finally noticed, and all that the parents knew how to do, and money could procure was done for him; as strapping down in bed, wearing of different braces, but without success.

I told the lady that I was convinced the disease could be arrested, but as this was out of my line of practice, she would better call on one of our orthopedic surgeons. Whereupon, October 27th, 1876, Dr. L. Bauer was called in, who treated the child with various orthopedic appliances for about six months without much benefit. On May 12th, 1877, Dr. Bauer had recourse to Sayre's plaster of Paris jacket, which was applied and re-applied *secundum artem* as often as necessity required for twelve months with apparently little or no advantage. During this period

a very troublesome cough developed itself, that became gradually worse despite all treatment. On May 3d, 1878, when a new bandage was again to be applied, Dr. Bauer remarked to me, that unless something else was done, the disease would not probably get well. With this opinion I the more readily coincided, as I had arrived at the same conclusion some time before, and had devised a plan which I felt almost convinced from former experience gained by the use of similar means in dissimilar cases reported elsewhere,¹ would succeed, should the other fail. This plan I now communicated to Dr. Bauer who was well pleased with its (theoretical) *modus operandi*, and, instead of repeating the former apparatus, Dr. Bauer, with my assistance, applied the "cuirasse."

The curvature being in the upper dorsal region from the 2nd to the 6th vertebræ, the apparatus of Dr. Sayre, reaching from the axillæ to the hips, could evidently cover it but partially; the weight of the shoulders, head and neck derives its support, not from the jacket, but from the diseased spinal vertebræ. This permitted motion where at least partial rest is necessary, and *perfect rest* desirable. Thus consolidation was prevented, and nothing but the addition of the "jury mast" in addition to the already cumbersome apparatus seemed to promise relief.

Perfect rest could only be obtained by completely preventing the movements of the ribs, the scapulæ and clavicles, and by removing the superincumbent weight of the upper extremities, shoulders, head and neck. The experience with Sayre's "jacket" has clearly demonstrated (?) that such tight bandaging, as to fulfill these indications, is not admissible.

Nevertheless, one of the main features of my "cuirasse," consists in its tight application, even tight enough to obtain by it the requisites just mentioned. On account of the difficulty of obtaining a fixed point for the support

¹ Rest in certain Diseases of the Chest, *St. Louis Med. and Surg. Journal* November, 1873.

The Circular Bandage as a Remedy in Thoracic Affections.—*American Practitioner*, August, 1877.

of orthopedic appliances for spinal curvature, the crest of the ilium has from time immemorial been utilized for this purpose, and consequently even the most recent inventions depend upon it as a *point d'appui*. Without completely encircling the abdomen, this point cannot be utilized, since any movement would displace the apparatus.

Thus Sayre's jacket necessarily interrupts the abdominal respiration as well as the thoracic, and consequently would cause apnœa if tightly applied.

With the "cuirasse," support from the hips is not necessary, as it finds all its points of support in the thorax, and leaves the abdomen and loins entirely free. It can, for that reason, be applied much more tightly than the jacket, even to complete immobility of the ribs, clavicles, and shoulder-blades; and, in consequence of this immobility of the entire thorax, it carries easily the superincumbent weight without molestation of the affected structures.

The "cuirasse," or vest, as Dr. A. J. Steele calls it, may be made, like Sayre's jacket, of other material, or of plaster of Paris rollers and strips of tin or veneering. The patient being suspended and provided with a thin, tightly fitting undershirt, as directed by Dr. Louis A. Sayre, rolls of cotton or folded cloth are stitched to the undershirt on either side of the curvature. The bandage is applied first by a few circular turns around the chest, sufficiently tight to prevent the respiratory motion of the ribs, then obliquely across the shoulders so as to immobilize the clavicles and scapulæ. This is continued by means of an occasional reverse of the roller until the entire chest is covered, reaching down behind to the twelfth dorsal vertebra, from thence along the lower border of the ribs and costal cartilages to the inferior extremity of the sternum, and above from the vertebra prominens, along both sides of the neck to the upper border of the sternum in front, thus covering the thorax completely as by a shell. This bandage, when tightly applied and allowed to harden before the suspension is interrupted, will keep up every advantage gained by the suspension, since on account of its tight applica-

tion, it sustains the chest rigidly in the shape thus given to it. Respiration is henceforth altogether abdominal. The diseased vertebræ are free from pressure, and undisturbed by the motions of the loins and head, and by the fixation of the shoulder-blades and clavicles, of those of the upper extremities. They are also pressed as nearly as possible in a line with their healthy neighbors without pressure on the prominent spines, because of the lateral pads; their healthy parts sustain the weight, while the diseased bodies of the vertebræ are left free and unincumbered. Thus the "cuirasse" is to the chest as solid and complete a splint as ever was applied to any single fractured bone.

The necessary exercise for the maintenance of the general health is greatly favored by it on account of the perfect freedom of all the customary motions. When the patient is dressed it is so nearly invisible, that none but those initiated will notice its presence.

On May 3d, Dr. Bauer applied the bandage skillfully and neatly, not, however, without misgivings as to the consequences. After the application the patient was apparently comfortable. Dr. Bauer promised to return after about two hours, and requested me to call two hours later so as to keep the case under sharp surveillance. On my return I was informed that the apparatus had proved a complete failure, and that Dr. Bauer had promised to re-apply Sayre's jacket in the evening. The child complained bitterly of pain in the precordial region and of difficulty in breathing, and refused to sit or stand up. On inspecting the apparatus, I found that a few turns of the bandage had accidentally been applied lower down in front than desired, i. e., over the epigastric region, and thus interfered considerably with abdominal respiration. With my pocket-knife I scraped and cut a triangular piece out of the bandage so as to make it correspond to the line of the costal cartilages in that region, to the great comfort of the child. When we met in the evening for the purpose of re-applying the old apparatus, we found it unnecessary, as the patient stated that this felt very comforta-

ble, in fact much more so than anything he had worn before, and that it enabled him to perform a great variety of movements without the least inconvenience or pain, which he dared not, if he could have attempted before. The troublesome cough had ceased with the application of the bandage, not again to return. The "cuirasse" was comfortably worn for nine weeks. Being more tightly applied, it has to be removed sooner than the Sayre's jacket, as it is more quickly outgrown.

A new bandage was applied July 12th, but in consequence of the inferior quality of plaster accidentally used, the apparatus soon crumbled, and accordingly a new one was substituted on August 2nd. Dr. Bauer being out of the city at the time, Dr. A. J. Steele was called in for that purpose, and the apparatus now for the third time successfully applied. As the child was to be removed for the hot season to the North, his parents desired that the splint should be fixed so that they could easily remove it, should necessity require. To meet their wish, I cut it open over one (the left) shoulder and down on the same side, breaking the plaster with a dull knife and hammer by gentle blows on the opposite shoulder and side, so as to make the remaining cloth act as a hinge, then separating the cut edges made the boy, his right arm extended horizontally, step out of the shell to the left. Along the cut edge, over the side and shoulder I had buckles and straps attached.

During his sojourn in the North, the boy fell twice out of a skiff into the water, which weakened the splint to some extent, but, since he did not complain, he was allowed to wear it thus until his return. It was then (middle of September) found badly damaged, but it was considered unnecessary to make a new one, as the disease was apparently cured. He still continued, however, to wear it for two or three weeks, when it was entirely discarded.

On a verbal report of this case before the Missouri State Medical Association, May 22nd, 1878, it was objected by Dr. Wm. Porter, of this city, that such a confinement of the chest might be the cause of tubercular degeneration in

the apices of the lungs. I am now prepared to state that the boy never showed the least sign of trouble in the lung, and is to-day, more than two years after the removal of the "cuirasse," as healthy a child as can be found anywhere. The remaining curvature is probably not greater than it was during suspension.

The advantages of this "cuirasse" are obvious:

1st. Its useful action begins where that of Sayre's jacket, without the addition of a jury mast, becomes doubtful or ceases.

2nd. It makes an absolute splint for the whole chest, and consequently enhances the rapidity of the cure.

3d. All the natural motions of the body (except those of the thorax) are free and undisturbed, to the great comfort of the patient and benefit of his general health.

4th. It is less cumbersome and weighty than the jacket alone, and still less so than when a support for the head is added.

Its disadvantages are, that it is not applicable in curvatures of the lumbar region, nor in the cervical, unless a head rest is affixed to it.

The feasibility of immobilizing the chest to such an extent without detriment to the patient being once recognized, this "cuirasse" *may* find more extended application, as for instance in fractures or dislocations of the clavicle, scapulæ, ribs and vertebræ.