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THE amount of relief which may be obtained from a combination of mechanical with medical treatment in aggravated cases of scrofulous diseases of the spine, with or without angular curvature, is often greater than, *a priori*, we should have deemed possible. The following cases are extracted from my note book, as among the most strongly marked and unpromising examples of this affection.

The first to which I would refer is that of a boy, 11 years of age, who came under treatment in February, 1847, and is thus described. "This patient has severe angular curvature in the lumbar region, by which he is much bent forward. In walking, he is obliged to put his hands upon his knees for support. His legs are exceedingly feeble. He is of a scrofulous constitution; light hair, light eyes, fair complexion. Grandmother died of phthisis. The disease of the spine was first noticed two years since. It cannot be traced to any injury. Two months since, had an attack of fever, accompanied by costiveness, and by almost complete loss of power in his legs. At this time had pain in urinating. There is fluctuation in right lumbar region, three inches from spine." The treatment consisted in the application of supports for the spine, combining their use with constitutional treatment—iron, iodine, quinine, nourishing diet, friction, &c. The supports employed in this and similar cases, are such as I have found, upon the whole, liable to the fewest objections, and the best calculated to fulfil the most important indications in this disease. They are so constructed that there shall be no pressure upon the chest. The ribs are left without the least impediment to respiration, and the shoulders drawn backward, to enlarge the diameter of the thorax. By the same means, a slight degree of elastic pressure is made upon the projecting vertebræ, while the body is straightened, so as to prevent, as far as possible, the diseased and carious surfaces of bone from pressing against one another, and to relieve them of the

superincumbent weight of the head and shoulders. Otherwise, of course, this weight upon the spongy and crumbling bone is constantly tending to increase the disease. Gentle exercise in the open air was permitted.

The memorandum for March 30th states "that the supports fit well, and the result is most satisfactory. The boy walks with his back comparatively straight, his head erect, and his whole appearance so altered that he would scarcely be recognized by one who had only seen him in his former bent position. His mother speaks of sending him to school. His general health is much improved." The record, six months later, states that "the boy is doing well, and is constantly at play in the streets with the other boys." In this case, as appears by the report, the protuberance was at once materially lessened by the mechanical support; he walked comparatively straight, and at the last date it seemed probable that anchylosis was taking place, by which return of the curvature would be prevented. Soon after this period I lost sight of the patient.

Another case was from St. Johnsbury, Vt., treated in 1852. "Child, five years old. Has angular curve in dorsal region, implicating five vertebræ—from the fifth to the eleventh. The spinous processes of the two latter are in such close contact as to be liable to be mistaken for a single process. The shoulders are much raised, probably caused in part by the habit of relieving the back of the weight of the head and shoulders by throwing it upon the arms, resting either upon the thighs, upon a table, or arms of a chair, &c. The respiration, most of the time, especially during sleep, or when the mind is occupied, is noisy, amounting almost to a grunt. It is also, at intervals, apparently painful, particularly when attempting to take a long breath. He cannot draw a full inspiration. In October, 1850, he fell from a chair, and came upon the floor in a sitting position. His mother thinks that he began to breathe badly from that time. The angular projection was first observed last winter" (1852).

The treatment was similar to that pursued in the case just cited. Supports adapted to the spine, rest a portion of the time in the recumbent position, friction with brandy and salt, and constitutional remedies. The apparatus supported the patient in an upright posture; the respiration became normal, and, by perseverance in the course prescribed, all the unfavorable symptoms gradually disappeared. This patient removed to Philadelphia. I received a visit, however, from him in 1854, two years after treatment, when

he was in perfect health, with the exception of a slight ophthalmia. There were still some remains of the angular protuberance, but it had much diminished.

A number of other cases could be cited, if it were deemed expedient, in which the result of the treatment here recommended was equally successful; in some of which, complete paralysis of the lower limbs had existed for several months.

In caries of the vertebræ, the true principle, bearing in mind the state of the bones, is undoubtedly to treat the disease as a fracture, so far as this is possible consistent with the health of the patient.

In the first place, the spine should be kept fixed, free from motion at the seat of disease. Second, the weight of the upper part of the body should be removed from the carious bones, and these should not be allowed to come in close contact, otherwise absorption will be promoted. In this respect the treatment, of course, differs from that pursued where there is a simple solution of continuity in a healthy bone. While the anterior part of the bodies of the diseased vertebræ are thus relieved, gentle pressure may be made against the projecting spinous processes by means of a pad and spring. That instrument is the most appropriate which is modelled upon the above general principles, and which will best fulfil the indications which result from them. The one here used is a modification of that described by Mr. John Shaw, of London. It consists of a similar pelvic girdle, which, however, is fitted and curved above the iliac bones, so as to grasp them superiorly as well as laterally, somewhat like a hand placed upon them, and of similar steel uprights, with crutches. This furnishes the basis, consisting of a firm foundation on the pelvis, with side splints for support, and to prevent lateral motion. These last are improved by being bounded over the lower ribs so as to produce no restraint upon their action. If we add to this a back splint in the shape of a steel spring, with a round concave pad to receive the projecting processes, to steady and support the spine, and to produce slight continued pressure upon the circumference of the protrusion, we have, perhaps, as perfect a fracture box as the circumstances will allmit. The pad should be so made as to give immediate local support and fixedness to the diseased bones, and from it straps should extend over the shoulders, to draw them backward and expand the chest. This is still further accomplished by having the anterior horn of the crutch lengthened upward to embrace the clavicles, connecting the two sides by an elastic strap across the back.

This class of patients are debilitated and cachectic, and the disease tends to diminish the capacity of the thorax and abdomen from above downward, and to embarrass the contained organs. It is certainly consonant with sound theory, and experience has proved the importance of the principle in practice, that whatever mechanical means are employed, they should be such as will produce no further restriction of the respiratory function, no impediment to the free action of the ribs. Having combined the above treatment with passive exercise in the open air, and with such general remedies as seem appropriate, nature must be left to do the rest, and the result depends upon the fidelity with which our directions are complied with, and upon the original constitutional vigor of the patient. The attempt to portray, by casts or drawings, the different stages of a complaint affecting a part naturally so flexible as the spine, is very unsatisfactory. They depend much upon the position in which the patient is placed at the moment, or upon muscular atrophy or development at different periods; and if relied upon, they will tend to mislead both the physician and the patient, as well as others. It has, therefore, seemed best not to depend upon them in the description of a case.

Posterior curvature of the spine, where the bodies of several vertebræ have been especially affected by rachitic softening, and being compressed by the weight of the upper part of the body, a corresponding projection of the spinous processes has resulted, may often be mistaken for the more fearful disease, caries. In such instances complete cures may be effected, with no remains of the deformity, sometimes by very simple mechanical means, such as a figure-of-eight band round the shoulders, or other more complicated shoulder braces.

Sir Benjamin Brodie, in speaking of this affection, says: "Nevertheless, I am satisfied that these different kinds of curvature, arising from different causes, have frequently been confounded with each other; and that some of the cases which have been published as examples of caries of the spine, and in which it may, at first, be a matter of surprise that so complete and speedy a cure should have been effected, have in reality been cases of an entirely different malady.* Dr. W. J. Little, of London, whose experience in cases of this description is perhaps unequalled, likewise states that "rachitic posterior curvature may become angular in its progress."†

* Brodie on the Diseases of the Joints, p. 254.

† Little on Deformities of the Human Frame, p. 350, note.

In true caries, however, a very different method of treatment is required, and the relief which is afforded in a majority of instances by following a course consistent with our knowledge of the pathology of the disease, sometimes resulting in a complete recovery, with more or less amelioration of the deformity, is a sufficient encouragement for its adoption in similar cases. So true is this, that whereas, some years since, I felt unpleasantly to see a case of this description, believing that art could accomplish but little for such a formidable malady, now, on the contrary, there is a satisfaction in undertaking the treatment, for, if a complete cure is frequently impossible, there is yet a strong probability that much suffering may be relieved and comfort attained.

As the diagnosis of spinal caries at an early period is confessedly very difficult, it is important to describe a symptom which will enable us to detect its existence, at a stage prior to that where its disastrous results have become decidedly manifest, and which I have never seen noticed or referred to by any writer upon the subject.

Frequently angular curvature is preceded by *incurvation* of the spine, usually in the dorsal region. The shoulders are thrown back, an exaggeration, in fact, of what is generally considered a characteristic of a fine figure. The child walks with his head and shoulders posterior to the median line. This is the reverse of what takes place later in the disease.

It seems to me probable that the condition here referred to, may in part arise from a swelling of the bodies of certain vertebræ, particularly their anterior portion, this being the part usually found most extensively affected by caries, together with consecutive tumefaction of the intervertebral substance. We know that swelling of bone, and of the soft parts in its neighborhood, precedes carious disease in other parts of the frame. From analogy I should expect that the pathology of spinal affections would correspond with that which exists elsewhere. At the period, however, when we have an opportunity to examine the morbid appearances, they are often such as would lead to the conclusion that ulceration and softening of bone and cartilage are not always preceded by the usual characteristics of inflammatory action.

The description, nevertheless, which is given by Mr. Paget of scrofulous disease, as it makes its first inroads upon the osseous structures, tends to sustain the views I have here advanced of the early pathology of spinal caries, as connected with its primary cha-

racteristic symptom. He says: "The abundant deposit of tub cle and the fulness of the vessels in the inflamed and soften bone make the swelling in this form (the tuberculous) more c siderable than in the preceding; yet it is rarely, if ever, great. * The changes produced by circumscribed tuberculous deposit bone are comparatively seldom seen, for the disease is of sl progress, and rarely leads to death or amputation before the m diffuse ulceration has supervened and destroyed its characteri features. The diffuse disease is, therefore, that which has b most studied and which has supplied most of the examples of scr lous caries—'Pott's disease of spine,' 'Pædarthrocace.' It is t which is chiefly attended with ulceration, or perhaps tubercul deposits in the neighborhood of diseased bones. * * * Inflam tion indicated by all its signs is a common precedent and atte ant of tubercular deposit."*

An additional explanation has been proposed by Dr. J. B. Jackson, which may partially account for the symptom, viz., t the pain occasioned by any forward pressure on the diseased bo causes the child instinctively to seek relief by throwing the h and shoulders backward.

It is not improbable that this primary incurvation is very c stantly present as the first indication of scrofulous spinal disea but does not, in most instances, attract attention, or is regard by the parents as a peculiar beauty in the form of their child, w is otherwise feeble and of a tuberculous diathesis.

It is evident that marked benefit must arise from the general cognition of this premonitory sign. The measures, hygienic a special, which the judicious physician will be led to adopt wh the disease is yet in its incipient stage, we have a right to anti pate, may in many instances check the advance of the specific flammation, and tend to remove the effects of that which has p viously existed.

As the disease progresses, loss of substance takes place, t bone becomes converted into a spongy, brittle mass, and yields the opposite direction. This formation of angular curvature som times occurs suddenly; there is an immediate breaking down a teriorly of bone, the normal texture of which has been gradual destroyed.

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* Surgical Pathology, pp. 682 and 683.