ACUTE ANTERIOR POLIOMYELITIS.

THE RELATIONSHIP OF INJURY TO THE LOCALISATION OF THE PARALYSIS.

By Harry L. Parker.

The problem of the relationship between injury and disease of the central nervous system is ever present. Many diseases not usually associated with trauma have been alleged to follow an antecedent injury. In all cases extreme caution is necessary before drawing conclusions, and certainly the margin of error lies in a too ready assumption of cause and effect. In the discussion below it is important to emphasise from the outset that no claim is made as to injury being in any way a cause of acute anterior poliomyelitis. It is further doubtful whether injury can predispose the patient to the disease, aggravate it or have any more than a coincidental relation to a virus infection. On the other hand, some clinical material has become available that is of sufficient interest even from the standpoint of starting a debate to make it worthy of record.

Case I. During the latter end of September, 1932, a child aged six years was crossing the road and was hit by a motor-car. The child was flung to the side of the road by the impact, but was not run over by the car. As a result of the injury both lower extremities were severely bruised, although no bones were broken. She was put to bed and kept there for over a week. At the end of that time an acute illness intervened, associated with fever. The pain in the injured limbs had almost gone, but with the onset of this illness it reappeared and became acute. Three days after the onset of fever both limbs became paralysed, and about six months later the child was brought for examination.

There was a flaccid paralysis in both lower extremities, asymmetrical in character and without any sensory changes. There was no disturbance of sphincteric control. At the time of examination the injury was stressed by the parents.

Comment.

In this first case it seemed reasonable to assume that the accident was the sole cause of damage. A hemorrhage into the spinal cord was considered. Actually the clinical picture was more that of acute anterior poliomyelitis. At the time no clinical conclusions were reached and the matter was regarded as a coincidence difficult to explain.

Case II. A well-developed, muscular farmer came for examination in 1933 because of paralysis of the right leg. He stated that during the month of September he was riding his horse over broken ground. The horse fell and threw him. As a result his right leg was injured so that there was a severe bruising and laceration of the outer side of the limb. He was forced to remain in bed as a result of his injuries. About ten days later and while still in bed he became severely ill with a high fever, stiffness of the neck and pains in both lower extremities. Later on, while recovering from this illness he attempted to walk and found that the muscles of his right lower extremity were paralysed, mainly below the knees. For this he sought treatment. On examination there was found a flaccid paralysis of the anterior tibial group of muscles and also of the hamstrings. Without any history a diagnosis would have been made of
acute anterior poliomyelitis. A conspicuous feature was the evidence of previous injury in the form of scars and relics of contusions.

Comment.

This case was too clear-cut to be regarded as a coincidence. The outstanding facts were that the patient had received a severe injury to his right leg, was recovering from it, and then came down with acute anterior poliomyelitis. The fact that the paralysis was located in the injured member seemed to be more than a coincidence.

Case III. A child aged six years came for examination because of paralysis in the muscles around the left shoulder joint. During the first week of September, 1936, while playing in school she was pushed by another child and fell, striking the left shoulder. At home it was noticed that the arm was lame, but nothing was done about it beyond keeping her at home from school. She returned to school later in September and seemed none the worse for her injury.

On October 7th, 1936, she had a chill, ran a high temperature, and complained of pain in the left arm. Two days later there was definite rigidity of her neck. Her local physician regarded her as a case of meningitis. Rather suddenly four days after the onset of her illness she lost the use of her right arm. Thereafter she became better, her temperature reached normal, the pains in her limbs disappeared, but she was left with a paralysed left arm.

Examination of the child showed a flaccid paralysis of the left upper extremity, chiefly around the shoulder joint. The muscles most involved were the deltoid, supraspinatus, infraspinatus and, to a less extent, the biceps. The muscles of the forearm functioned normally, although at one time the whole left upper extremity was paralysed. Following physiotherapy and support there was some improvement of the muscles, but there was a residual paralysis of the deltoid and shoulder muscles. Atrophy was present from the time of examination and increased while she was under observation. On discharge from hospital on April 12th, 1937, the appearance of her difficulty was characteristic of the late results of acute anterior poliomyelitis. Lest her original injury be minimised there was definite evidence of the same. Palpation of her clavicle on the left side showed a bony callus in its middle third. Roentgenological studies of the bone showed an old fracture. The outer fragment was displaced slightly downwards and surrounded by callus in no way excessive.

Comment.

The child was presented for examination as a case of compression of the brachial plexus secondary to callus formation in the broken clavicle. The illness subsequent to her injury was not taken into account. The history of this illness was typical of poliomyelitis and, moreover, occurred as in the other two cases during the season of the year when this disease is prevalent. This last case is much more important than the other two in that the trail of circumstances is much more clear. On the other hand, there was the same sequence of events, the injury, recovery from the same, a latent period of convalescence, the onset of poliomyelitis, and a residual paralysis in the region affected by the injury.

Discussion.

In a previous contribution the pitfalls and fallacies of injury and subsequent disease of the central nervous system have been described. This study was in connection with tumour of the brain following injury. The cases were all of the glioma group and after