

the peripheral ganglia are involved, or the cord is crushed. The X-rays often fail to clarify matters. They cannot well be described as a primary aid. Of this means, Dunn well says: "It is not always possible or desirable to resort to the X-rays at once, but sooner or later great aid may be obtained from good skiagraphs in many cases. Nor will the rays prove infallible in diagnosis of these injuries. They are only a great aid in most cases, and it requires very expert work to make skiagraphs of the spinal column that are of much value. They are, perhaps, a greater service in certain gun-shot injuries where the ball has lodged in or about the vertebrae." Even the exploratory incision will fail to elucidate matters if the fracture is through a vertebral block. Nay, it may err when the more accessible pedicle or arch is shattered.

A case came under my care in March last—1902—illustrating the almost insurmountable difficulties in the diagnosis of spinal fracture. A young man aged 31 sustained a fall thirty-five feet from the elevated railroad, on the 12th of February, 1901. He was immediately brought to the hospital with paraplegia. Here it was supposed that a luxation existed, and several vain efforts at reduction were made. A week later he was entered at another hospital; there, a surgeon, who is among the pioneers of laminectomy, made an exploratory incision over the mid-dorsal region, assuming that there was a fracture at this site. Now, after more than a year, a well-marked kyphos has formed, consisting of the eleventh and twelfth dorsal and the first lumbar vertebrae, and at present the areas of palsy point to this as having been the primary seat of medullary lesion.

In fracture only involving the *extrinsic* parts, diagnosis is not infrequently quite impossible by any safe or justifiable procedures. In my experimental researches on spinal traumatism, it was repeatedly demonstrated that the arches might be cracked in two, or the bodies split in various directions, without a single central symptom supervening. Therefore, judging from analogy, one may often assume the probable presence of a fracture of the spine in man, after a violent injury, even though no positive evidence exists from the clinical aspects of the case; from all of which we may conclude that a "broken back" occurs more commonly than is generally assumed, and moreover, that it seldom menaces life, unless it seriously involves the cord; however, deformity and impediment in function may succeed.

At the International Medical Congress at Rome in 1894, the following was my summary on the topic of "Diagnosis in Spinal Fracture": "*First*, fracture of the spine has no well-defined symptom; *second*, in the majority of cases there is neither abnormal mobility, displacement or crepitus; *third*, experiment proves that the bodies or the apophyses may sustain multiple fracture without neural manifestations resulting; *fourth*, in those cases in-