Treatment.—Along with the surgical treatment of the fracture I administered the necessary treatment for his gonorrheal urethritis. With three-inch width strips of adhesive plaster I applied a Velpau bandage, and maintained the upper extremity and clavicle in good position.

Results.—Within four or five days the sternal swelling disappeared, and in twelve days the urethritis vanished, and then there only remained the subsequent treatment of the clavicle. At the end of the fourth week the patient wished to return to work as barn hostler and I very reluctantly freed him from his bonds. I had contemplated having him tied up for at least six weeks, considering the injury of a year before and his recent complication.

Now that five or six weeks have elapsed, I had the opportunity to examine this young man, and I find excellent motion in all the joints concerned.

CASE 2.—A case of interest in this connection occurred about two years ago.

History.—A young man, aged 21 years, came into the hospital during my service with a prominent swelling of the sterno-clavicular articulation. The chief surgeon suggested immediate removal of the sternal end of the clavicle. His diagnosis was "rapidly-growing osteosarcoma" of the clavicle.

Now the boy gave a distinct history of an uncured gonorrheal urethritis for the past two weeks. Microscopic examination showed gonococci. An *x-ray* picture showed slight shadow of circumscribed swelling at sterno-clavicular junction. The "tumor" had steadily grown for the past week. I argued in favor of gonorrheal synovitis.

Treatment.—Despite an interne's hopes and suggestions the boy was placed on the operating table next morning and everything made ready for operation. When I removed the antiseptic compresses from the region of the neck and chest the swelling was found reduced at least 60 per cent. of its original size on the day previous. It originally was larger than a hen's egg, well defined, around and posterior to sterno-clavicular articulation. No operation was performed outside of manipulation from the hands of the curious.

Suggestions were offered that the use of the *x-rays* had occasioned this wonderful change, and they were used daily for ten days. The patient then left the hospital, he and his friends holding the vague idea and opinion of a surgeon's skill in the use of the *x-rays* and magnetic touch.

63 East Chicago Avenue.

A CASE OF TETANUS TREATED BY SUBDURAL AND INTRASPINAL INJECTIONS OF ANTITOXIN. DEATH.

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Introduction.—The interesting phenomena which happened during the progress and treatment of a case of tetanus which occurred recently in my service¹ impels me to place the notes of the case on record. I believe the interests of the profession are best served by collating the material from all cases, whether successful or not.

History.—A male negro, 24 years of age, was admitted to the U. S. Marine Hospital, Baltimore, at 4 p. m., June 16, 1904. He complained of stiffness of the muscles of the lumbar spine, with rigidity of the muscles of the back of the neck. He noticed the beginning stiffness eighteen hours previous to admission to hospital, and ascribed his condition to the free drinking of ice water throughout the day.

Examination.—On admission he had considerable rigidity of the muscles of the lumbar spine and of the back of the neck. The neck was arched backward and there was slight opisthotonos. The jaw was stiff so that the mouth could not be opened as widely as formerly. On inquiry, the patient admitted that while working about a stable he ran a nail into the sole of the

right foot just five days prior to the onset of his symptoms. He stated that the wound gave him no further trouble.

Later Symptoms.—Two hours after admission there was noticed a decided increase of the rigidity of the muscles of the back, with some beginning stiffness of the muscles of the abdomen and flexors of the left thigh. The patient was sweating profusely, especially over the upper portion of the chest, neck and face. His skin was cool; temperature, 36.6 C.; pulse, 55 beats to the minute, full and strong. Heart action was tumultuous; no murmurs. There was now some difficulty in swallowing, and beginning stiffness of the sternomastoid muscles.

Three hours after admission there had developed, in addition to the tonic contractures mentioned above, an intermittent clonic spasm affecting especially the lumbar spinal and abdominal groups of muscles. These spasms arched the patient considerably. They were not typical of tetanic convulsions, being shorter in duration and occurring with greater frequency. The patient had an unnatural wrinkling of the skin of the forehead, due to the involvement of the occipitofrontalis muscle. There was no involvement of the risorius muscles. The muscles of the chest—that is, the intercostals, the pectoral and serratus magnus muscles—were only slightly rigid, and there was no embarrassment of respiration. The urine was normal, and there were involuntary evacuations of the bowels. All mental faculties were preserved, and there did not appear to be any hypersensitiveness to outside influences.

Treatment and Result.—Chloral was pushed in gram doses at half-hourly intervals during the six hours following admission. It produced drowsiness, but failed to have any effect on the spasms. Under chloroform, seventeen hours after admission, the skull was trephined over the parietal eminence, and 20 c.c. tetanus antitoxin were slowly injected under the dura. The wound was closed without replacement of the button of bone. At this time, 5 c.c. of cerebrospinal fluid were withdrawn in the ordinary antitoxin syringe by lumbar puncture, followed by the slow introduction of 10 c.c. antitoxin into the spinal canal. This latter procedure was thought advisable in order to get the more immediate effect on the toxin-locked ganglion cells which control the involved spastic abdominal and spinal muscles. The wound of entrance was laid open and packed. There was no shock incident to the operation, the patient reacted rapidly, and for three hours was free of spasms. As the effects of the anesthetic wore away, the convulsive movements returned, the patient dying of asphyxia within five hours after operation.

Remarks.—The points of interest to be noted in this case are the short period of incubation, which was exactly five days; the extreme rapidity of the course of the disease—forty-two hours—the marked involvement and apparent selection of the lumbar spinal and abdominal groups of muscles, and the comparative freedom from involvement of the muscles of the limb through which the tetanus organisms and toxin made their entrance. The negative evidence deduced from this case would advise, I believe, an early recourse to the use of antitoxin administered subcutaneously or along the sheath of the nerve trunk supplying the injured location as a preventive measure, or subdurally or intraspinally as a curative procedure.

Diphtheria in Healthy Throats.—M. Geirsvold of Christiania states in *Tidsskrift f. d. Norske Lægeforen*, No. 23, 1903, that he found diphtheria bacilli in the throats of 9.2 per cent. of 967 presumably healthy school children examined. The investigations were conducted in the schools during the period from May 28 to June 20, and 87 children were found to shelter the bacilli, in pure cultures in 22. In a later series in the fall he found them in 3.4 per cent. of 178 children. None exhibited any clinical symptoms. He remarked that this proportion is probably below the actual number, and that the children too young to go to school and adults also probably show a similar proportion, consequently strict isolation on the bacteriologic findings is impracticable.

1. In the service of Surgeon H. R. Carter.