Clinical and other Notes.

ASEPTIC MENINGITIS FOLLOWING INTRATHECAL INJECTION OF ANTITETANIC SERUM.

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During the latter half of September and October, 1914, we had under treatment several cases of tetanus. As the most important help in the treatment of this disease is its early diagnosis, it was inevitable that a great many "suspect" and doubtful cases cropped up and that many patients were submitted to antitetanic treatment when there was no such necessity. The routine adopted in a doubtful case was as follows: A general anesthetic was given, and a spinal puncture performed, five hundred units of antitoxin being injected in place of the lost fluid. This procedure was repeated, if necessary, every twenty-four hours. I may here mention that the induction of general anesthesia may make more evident the rigidity of the jaws, or may make appreciable a stiffness that was not previously apparent. The procedure has thus a definite diagnostic value. In these doubtful cases I noticed that after intrathecal injection many of the patients showed rigidity of the spine, and this was taken to confirm the diagnosis of tetanus. It struck me, however, that the injection of serum into delicate structures such as the meningeal spaces of the cord might cause irritation, together with backache and spinal rigidity. I accordingly examined the cerebrospinal fluids of all patients before and after the reception of tetanus antitoxin intrathecally.

The results are what would be expected. Before the injection the cerebrospinal fluid was clear, sterile, &c. Twenty-four hours later the average number of cells per cubic millimetre was four hundred, with ninety-five to ninety-seven per cent polymorphs, and three to five per cent small lymphocytes. No large lymphocytes or eosinophile cells were ever seen, and all fluids were discarded which contained red blood corpuscles. Cultivations with and without preliminary "enrichment" by incubation remained invariably sterile. Such were the typical results. An interesting phenomenon occurred in some cases. After the first injection, a second injection was better tolerated, and the fluid was almost clear on puncture twenty-four hours after the second dose.

One very extreme instance may be noted. Patient had symptoms of definite tetanus on February 21, 1915. The cerebrospinal fluid was clear and reducing action was normal; there were no cells; 3,000 units antitoxin were given intrathecally (six times usual dose).

Twenty-four hours later the following results were obtained: fluid
Clinical and other Notes

microscopically, pus; 1,600 cells per cubic millimetre; ninety-seven per cent polymorphs, three per cent small lymphocytes; cultivation sterile.

On post-mortem examination, the cord showed numerous white plaques on its surface with organizing lymph, and recent adhesions at the base of the brain. The cord has been sent to the Medical History Committee, Royal College of Surgeons. This was merely an extreme case; in every case examined a definite meningitis was found.

The following points may be noted:

1. The cells observed in the fluid do not come from the serum injected.
2. The reaction is purely local and does not follow subcutaneous injection.
3. The cause is probably simply the irritation due to the high albumen content of the serum. It is not probably due to the poisonous nature of the split proteins as has been suggested.
4. There is a danger that cases may be wrongly diagnosed as tetanus, the diagnosis being "clinched" by the meningitic rigidity of the spine following a first dose of antitoxin intrathecally.
5. The facts above cited should be considered before the administration of serum intrathecally to any patient who has not already got meningitis.

THREE CASES OF GUN-SHOT WOUND OF THE SUPERIOR LONGITUDINAL SINUS.

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The observations of Lieutenants-Colonel Gordon Holmes and Percy Sargent on "Injuries of the Superior Longitudinal Sinus," recently published, are so striking as to arrest the attention of all who are concerned, as neurologists, clinicians or surgeons, with the care of cases of gun-shot wounds of the skull. They have demonstrated that injuries of the superior longitudinal sinus give rise to a peculiar set of symptoms which constitute a definite clinical picture, briefly—paralysis with rigidity of the voluntary muscles, with a tendency to progressive recovery without contractures or other permanent nervous defects.

I venture to report three instances of this particular injury which have come under my notice during the past month. I was puzzling over the curious and anomalous symptoms presented by my first case when I received the British Medical Journal on October 4 (in France), and read therein their account of "the typical case," which might almost