Ligation of the common and external carotid arteries and the jugular vein, for arterio-venous aneurism of the internal carotid and jugular, with division of the optic nerve on the opposite side, the result of a gunshot wound / by W.W. Keen.

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Mr. St. John, a Frenchman, about twenty-five years of age; was first seen at the Presbyterian Hospital in Chicago, August 9, 1893, in consultation with Drs. D. W. Graham and N. Senn. Unfortunately, in consequence of change of residents and absence from the city, the history is imperfect.

About three years before I saw him he had been shot, the ball entering just below the tip of the left mastoid. He was unconscious for a brief time, but when he recovered, either the same day or the next morning, he discovered that his right eye was absolutely blind. In addition to this, his right arm was paralyzed, but whether immediately after the accident or at a somewhat later period was not ascertained. When I saw him, the right arm was the subject of contractures, the result of the old monoplegia. The leg and face were not affected. The aneurismal bruit and thrill were very marked, and could be felt down the left side of the head and neck. There was but little external swelling. The man sought relief on account of the noise produced by the aneurism, which made it impossible for him to do any work.

Operation, August 15, 1893, by the kind request of Dr. Graham. The carotid was laid bare by the usual incision over the anterior

border of the sterno-cleido-mastoid, the middle of the incision corresponding to the upper border of the thyroid cartilage. Considerable difficulty was found, even at this stage, in consequence of the inflammatory adhesions resulting from the gunshot wound of three years before, and also from the fact that the vessels lay nearly under the middle of the sterno-cleido instead of under its anterior border. My intention had been, first, if the adhesions (the presence of which I had anticipated) would allow me to reach the internal carotid, that I should tie that and the jugular just above the bifurcation of the carotid, but if the adhesions prevented this, I determined to tie the common carotid and the external, the latter being tied so as to prevent the re-establishment of the current by the anastomotic circulation from the other side. Even the ligation of the external carotid above the bifurcation was quite difficult by reason of the adhesions. It was done just at a point where the first branch was given off, and the ligature was made to include both the external carotid and its branch in one loop. The jugular vein was tied at a point half an inch below the level of the ligature around the common carotid, in order that the necessary injury to the tissues should not be at the same level. The veins were very full, giving thus an additional evidence that the diagnosis of arterio-venous aneurism was correct.

Dr. Graham has kindly written me under date of October 2d as follows: "The wound healed practically by primary union. One angle was a little slow in closing, but there was no purulent discharge at any time. The morning after the operation ptosis and immobility of the left eyeball were discovered, although he could turn the globe outward somewhat, and slightly upward. The pupil was not affected, but responded to light. There were no mental disturbances or paralysis. In two or three weeks improvement began in the eye, and when he left the hospital three weeks ago he could keep the lid up nearly in a natural position and could move the eyeball in every direction, promising complete restoration from the paralysis. He was to report to us occasionally, but I have failed to see him since then."

Remarks.—I regret very much the imperfect history of the case, but the circumstances made it impossible to get any more complete history. For the same reason no examinations of the eye-grounds were made, either before or since the operation. For-

tunately, the absence of a post-mortem prevents our ascertaining absolutely the pathology of the case. The ball after traversing the bloodvessels entered the skull at its base, and without doubt cut the right optic nerve between the eyeball and the chiasm. The paralysis of the right arm was due of course to the involvement of the left motor cortex, or fibres proceeding from it. Whether the ball in entering the skull was split into two pieces, one of which injured the left cortex in the arm area and the other the right optic nerve, or whether the paralysis of the arm was due to an embolus from the arterio-venous aneurism, can only be speculated on. None of the ball was ever found. What the final result as to the aneurism will be has not yet been ascertained.