Intramedullary Spinal Cord Abscess

Report of a Case Secondary to Stab Wound with Good Recovery Following Operation

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Case Report

History. A.C., (MGH #1983000), a 42-year-old Italian-born laborer, was admitted to the Massachusetts General Hospital on November 23, 1968. He spoke almost no English. Fifteen days prior to admission while walking along a street at night, he was stabbed in the posterior cervical region. He fell to the sidewalk and could not arise. Shortly thereafter police took him to a first aid station where the wound was cleaned and dressed. He was given an injection of penicillin and taken home. For 2 or 3 days there was practically no movement in the right arm or leg. Then strength slowly increased in the right leg and he was able to walk around his apartment with the assistance of others or by holding onto furniture. From the time of the original injury he had noted great hesitancy in urination. Defecation was normal. His condition remained stable until 3 or 4 days prior to admission when he noticed progressively increasing pain in the right shoulder and return of weakness in the right leg so that he was no longer able to stand.

Examination showed an agitated, obese adult male who although fully oriented would not relate an accurate account of his illness or cooperate with the examiner in spite of repeated attempts with the assistance of an interpreter. He complained continuously of pain in the neck and right shoulder. Temperature was 99.6°F., pulse 94, and respirations 20. Blood pressure was 134/76. A 1.5 cm. scar, well-healed, was present in the lower cervical region just to the right of the midline. All movements of the neck were greatly limited by pain. The remainder of the physical examination was normal including rectal sphincter tone rated as “good.”

Examination of the cranial nerves was normal except for slight right ptosis and difference in size of the pupils. The right pupil was 3 mm. in diameter; the left, 4 mm. Both reacted to light and accommodation. The patient was quadriplegic with severe weakness of the right limbs, but only slight weakness on the left. Paresis of the right arm was so marked that it could hardly be lifted against gravity. Weakness was most marked in extensors of the right wrist where only a trace of voluntary movement could be detected; there was also severe weakness in triceps, biceps and flexors of the wrist. Perception of pinprick was slightly diminished bilaterally from the mid-cervical region downward; on the left there was analgesia to pinprick over the trunk with hypalgesia in the saddle region and on the lateral aspect of the left leg. In spite of repeated attempts in the presence of an interpreter, 3 examiners were unable accurately to assess proprioception or light touch in any extremity. The tendon reflexes of the arms showed only a trace of response in the right biceps, triceps and brachioradialis while the left was normal. The knee and ankle jerks were symmetrically normal. The abdominal reflexes were all absent. The Babinski response was up-going on the right, and down-going on the left. Five or 6 beats of ankle clonus were present on the right but none on the left. The patient was able to stand but could not walk without assistance.

Laboratory data. Hematocrit: 44 per cent. White blood cells: 7,500 per cu. mm. with 72 neutrophils, 36 lymphocytes, 1 monocye and 1 basophil. The urine was normal.

X-rays of the cervical spine showed only straightening of the normal curvature. Chest x-rays showed no abnormality.

On the day of admission to the hospital a lumbar puncture was performed. Opening pressure was 200 mm. With bilateral jugular compression, a rise to 290 mm. occurred in 10 secs.; upon release, a fall to 240 mm. took place in 10 secs., and in 15 secs. pressure was at its original level. With abdominal compression, the pressure rose to 300 mm. and fell to its original, each within 10 secs. The cerebrospinal fluid was moderately xanthochromic and contained 380 crenated red blood cells in tube 1 and 400 in tube 3; neither specimen contained white blood cells. Protein: 485 mg. per cent. Sugar: 57 mg. per cent (simultaneous blood sugar not tested). Colloidal gold 1111122222. Cultures planted on blood agar plate and in thioglycolate broth showed no growth; a smear on chocolate agar grew a single colony of Staphylococcus aureus.

On November 24, 1963, the patient developed overflow urinary incontinence and an indwelling catheter was inserted. Otherwise there was no change in his condition. At the time of myelography on November 25, 1963, lumbar puncture showed an initial pressure of 280 mm. with no response to bilateral jugular compression. Three ml. of Panopaque were injected and the same amount of cerebrospinal fluid removed. The cord shadow was greatly widened in the lower cervical region and there was no flow cephalad to the C 5-6 interspace. The fluid contained 226 red blood cells, 123 neutrophils, and 90 lymphocytes per cu. mm. The protein was 750 mg. per cent and sugar 33 mg. per cent. No culture was made on this occasion.

Operation was performed on November 26, 1963. The patient’s condition had remained stable since admission, and we felt that he probably had an intramedullary hematoma. Bilateral laminectomy of C 4, 5 and 6 vertebrae was performed. A well healed linear scarred area in the dura, 1 cm. in length, was present slightly to the right of the midline at the C 4-5 level. There were no adhesions to extradural connective tissue when the dura was opened in the midline. The spinal cord appeared greatly swollen and there were dense adhesions between the laceration in the dura and the pia-arachnoid

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of the cord. These were divided. A #25 gauge needle was then inserted into the cord in an avascular area approximately 2 mm. to the left of the stab wound which lay obliquely on the right side at the C 4-5 level, and 0.25 ml. of purulent material was obtained. Aspiration through the stab wound itself yielded another 0.5 ml. but exploration 1 cm. cephalad and caudally to the stab wound revealed no pus. Gram stain showed a few positive cocci. In view of the marked swelling of the cord the dura was not sutured, but paravertebral muscles and subcutaneous tissues were carefully closed in several layers with interrupted catgut sutures and the skin with interrupted sutures of #34 stainless steel wire. During operation the patient received 500 ml. of whole blood in transfusion. This day he was also given hyperimmune gamma globulin for antitetanus prophylaxis and was begun on penicillin, 600,000 units intramuscularly, every 6 hrs., and chloramphenicol, 500 mg., every 6 hrs.

Postoperative course. Bacterial cultures of the purulent material aspirated from the spinal cord grew Klebsiella pneumoniae and a rare unidentified Streptococcus species. On the day after operation strength in the right lower limb was improved over preoperative status. On November 29, 1963, analgesia of the left trunk had changed to hypalgesia and sensation in the right side was normal. Lumbar puncture on November 30, 1963, showed moderately xanthochromic fluid under 265 mm. pressure; with bilateral jugular compression there was a prompt rise to 300 mm. and prompt fall to the original level on release. In view of this continuing improvement it was felt that any abnormality was probably associated with the open dura. The cerebrospinal fluid contained 19 red blood cells, 2 neutrophils and 25 lymphocytes per cu. mm. The protein content was 305 mg. per cent and sugar 67 mg. per cent. Bacterial cultures showed no growth. On December 1, 1963, the patient was able to lift the right arm from the bed against gravity and hold it suspended for a period of several minutes. There had been no change in the right Horner's syndrome.

On December 4, 1963, chloromycetin was reduced to 259 mg. every 6 hrs. and oral penicillin (Pen-Vee), 400,000 units every 6 hrs., replaced the intramuscular form. Gradual neurological improvement continued. On December 10, 1963, the bladder catheter was removed and he voided without difficulty. Within 2 weeks he was able to walk a distance of 75-100 ft. with assistance. On Christmas Eve antibiotics were discontinued, and he was allowed to go home for 2 days to spend the holiday with his family.

Another lumbar puncture on December 29 showed an opening pressure of 180 mm. Rapid rise to 380 mm. occurred with jugular compression, and rapid fall to the original level occurred on release. Examination on January 2, 1964, showed slight increase in strength of the right arm and leg; the gait was still hemiparetic and he lifted both feet high from the ground in walking. Proprioception was thought to be normal at the right wrist and right ankle but was severely impaired in fingers and toes of that side; it was normal on the left. Most of the tendon reflexes of both sides were now normal. The abdominal reflexors were still absent. The Babinski response was still up-going on the right, down-going on the left.

Improvement continued slowly and on February 7, 1964, he was discharged from the hospital. His gait had improved markedly but he still required a cane. Strength was still poor in the deltoid, trapezius, flexor carpi ulnaris, lumbricals, extensor digitorum communis and extensor digitii minimi of the right upper extremity.

Subsequently in the Outpatient Clinic he has complained of rather severe pain in the right shoulder radiating downward to the palm of the hand. Light touch in this region has been disagreeable. At the time of his last visit on July 25, 1964, the gait was virtually normal but there had been no change in the status of the right arm from that recorded in January.

Discussion

Woltman and Adson 18 in 1926 reported the first case of intramedullary abscess of the spinal cord diagnosed and operated upon during life with good neurological recovery. Two patients had been operated upon previously, 7, 12 but one of these did not survive and the other remained totally paraplegic. In a review of the literature, Woltman and Adson found that 26 cases had been reported since Hart's original description of the disease in 1830. 11 Subsequent authors have cited other cases and reported their experience so that the total number of known cases is approximately 50. 1- 6, 8- 10, 12- 17 Of these, 16 patients were operated upon; 10 patients lived, and 8 of these made good neurological recoveries. Dutton and Alexander 6 comment on the fact that patients with severe neurological deficits have often made excellent recoveries after drainage of intramedullary spinal abscesses whereas this has not been true in individuals with profound deficits due to extradural spinal abscesses.

Intraspihal abscesses associated with congenital sacro- coccygeal fistulae have not been included in this review. Other case reports have described a wide variety of antecedent infections such as pneumonitis, endocarditis, septic abortion, mastoiditis, etc. Several have been primary abscesses of the cord without other known infections. Organisms cultured from the abscess cavity have included staphylococcus, streptococcus, pneumococcus, actinomycosis and coliform bacilli.

The patient in the case reported here was treated by needle aspiration and by the decompression afforded by laminectomy and opening of the dura. Antibiotic therapy was continued for 4 weeks because of the recognized high incidence of recurrent abscesses following drainage.

Summary

A case of intramedullary abscess of the cervical spinal cord following a stab wound in the posterior cervical region has been presented. This patient made a good neurological recovery following aspiration of the abscess, decompression, and antibiotic therapy.

References

1. Abenhurk, B. S., and Bogorad, D. E. Peri-nephritic abscess and diseases of the vertebrae and