

Impending Vagus Nerve Paralysis Accelerated to Full Manifestation Following Cervical Intrathecal Neurolysis

— Case Report —

Seiji WATANABE, Naomitsu OKUBO,
Yoshihiro HAMAYA and Yasumasa YUDA*

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It is difficult to control cancer pain in the neck. Intrathecal neurolysis is one of the pain control modalities. Recently we observed paralysis of the right vagus nerve peripheral branch in a patient who received cervical intrathecal phenol block for cancer pain in the neck. With the exception of motor and recto-vesical disturbance following a lumbar and/or lower level intrathecal neurolysis, this kind of complication is sufficiently rare to be reported.

In this report we discuss the case in detail.

A Report of a Case

A 45-year-old male, 65-kg in weight, and 172-cm in height had been diagnosed as having lung cancer and began to have severe pain in the right side of the neck because of lymph node metastasis 6 months prior to consultation. This pain was characterized as a constant burning as well as a triggered muscle contraction type pain existing inside

and behind the ear, around the angle of the jaw, and in the neck. Conservative treatments including repeated epidural administrations of fentanyl 0.05 to 0.1 mg in normal saline 5 to 10 ml, eventually failed. The patient became bedridden because of the pain. Ptosis of the right eye was observed. His right arm eventually became paralyzed supposedly as a result of tumorous invasion of the cervical plexus. An intrathecal phenol block was considered to be indicated. The patient and his family were fully informed about the procedure and accepted the possibility of complications such as cranial nerve paralysis.

CT-scan examination carried out prior to the neurolysis revealed tumorous invasion up to the cranial base in the right side, but the cervical vertebrae was intact. The patient laid himself on his right side, painful side down. A straight line drawn between the major occipital tubercle and the spinal process of the 7th cervical vertebra was set horizontal using a water level adjuster. Cervical spinal tap was done at the C2/C3 and C3/C4 interspaces using a 25 gauge spinal needle under X-ray control. After clear CSF came out of the needle hub, 0.2 ml and 0.3 ml of 10% phenol glycerin solutions were injected respectively over a minute. Shortly the pain was completely relieved. During the

Department of Anesthesia, Mito Saiseikai General Hospital, Ibaraki, Japan

**Director of Pain clinic, Kanto-Teisin Hospital (Nippon Telegram and Telephone Corporation), Tokyo, Japan*

Address reprint requests to Dr. Watanabe: Department of Anesthesia, Mito Saiseikai General Hospital, 3-3-10, Futabadaï, Mito, Ibaraki, 311-41 Japan

next 45 min, the patient was retained in the injection position. Analgesia to pin prick method was observed in the right temporo-occipital area and right side of the neck. Nothing eventful was observed during the procedure and the observation periods. Two days after, he still complained of muscle contraction type pain alone which could not be controlled by any medication. One week after the first block, phenol block of C-4 posterior root was scheduled. When the patient took the same position as the previous time on the nerve blocking table, he started to cough. This suggested aspiration of saliva into the trachea, but his phonation was normal. The block was performed using 0.3 ml of the same agent, and similarly brought a complete relief of the pain. After returning to his ward room, about two hours after the block, he noticed hoarseness and swallowing difficulty. Neurological examination revealed that the right soft palate was elevated, and right vocal cord was fixed in the middle position. Retching could be induced by stimulating the ipsilateral posterior pharyngeal wall using a tongue blade. On the basis of these findings, we diagnosed that peripheral paralysis of the right vagus nerve had developed. The patient and his family were satisfied with the painless outcome; however a feeding tube had to be introduced into the stomach through the nose instead of taking food through the mouth. He was so revitalized and his appetite increased so much that he complained of being hungry. He was discharged to his home temporarily. During the next three weeks, he was essentially free from pain. The quality of his life looked far more excellent than before. In the 4th week after the second block, very nearly the terminal week of his life, the same types of pain, but to a lesser extent, reappeared and were controlled by a pain relieving suppository.

Discussion

When an neurolytic agent is injected into the cervical subarachnoid space, life threatening complications as well as cranial nerve paralysis may occur because of proximity to the brain stem¹⁻³. However a report of such

complications is not available heretofore⁴. In the present case, it is unlikely that the phenol solution used gravitated rostral beyond the foramen magnum⁵ to reach the vagus nerve because the first block was performed uneventfully and closer to the foramen magnum than the second one. The following may explain why this paralysis developed. Local or metastatic spread of carcinoma can involve not only the cervical nerve plexus but also a branch of the vagus nerve⁶. Prior to the second block, vagal branch paralysis was supposedly impending because of the tumorous invasion. Compression brought on by diminished support of the neck muscles following these blocks accelerated its manifestation. However we did not observe any signs suggestive of motor nerve paralysis of the neck muscles.

The position used in the present case was different from that discussed in the standard textbook³. The patient was not tilted backward by 45 degrees during the procedure. Backward tilting was not considered to help prevent the anterior root from being paralyzed because the cervical nerve root has a short intrathecal course and hence, the length available for absorption of phenol is shorter than elsewhere in the theca³.

In order to avoid cranial nerve paralysis and/or disastrous complications associated with cervical intrathecal neurolysis, alternative techniques such as subdural block^{5,7} or posterior rhizotomy² are recommended, but these techniques appear to require special training in order to be implemented. Cervical intrathecal neurolysis could dramatically decrease cancer pain in the neck and/or the upper extremities provided it is successfully performed even though the duration of pain relief following the block is variable.

In conclusion, cervical intrathecal neurolysis is worth while implementing because of the excellent quality of pain relief, but it needs to be performed most carefully, as the last choice, because of rare but serious complications.

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References

1. Swerdlow M: Intrathecal neurolysis. *Anesthesia* 33:733-740, 1978
2. Lund PC: The role of analgesic blocking in the management of cancer pain: current trend. A review article. *J Med* 13:161-182, 1982
3. Swerdlow M: Spinal and peripheral neurolysis for managing Pancoast syndrome. *Advances in Pain Research and Therapy* 4:135-144, 1982
4. Totoki T, Kato Y, Nomoto Y, Kurakazu M, Kanaseki T: Anterior spinal artery syndrome- a complication of cervical intrathecal phenol injection. *Pain* 6:99-104, 1979
5. Mehta M, Maher R: Injection into the extra-arachnoid subdural space. *Anesthesia* 32:760-766, 1977
6. Cousins M, Dwyer B, Gibb D: Chronic pain and neurolytic neural blockade, *Neural Blockade in Clinical Anesthesia and Management of Pain* edited by Cousins M & Bridenbaugh P, Philadelphia, Lippincott, 1988, p 1067
7. Ischia S, Maffezzoli GF, Luzzani A, Pacini L: Subdural extraarachnoid neurolytic block in cervical pain. *Pain* 14:347-354, 1982