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ORIGINAL ARTICLE

Peri-operative Nursing for Treatment of Cervical Spondylotic Myelopathy with Anterior Cervical Decompression Surgery for Anterior Cervical Spine

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ABSTRACT **Objective:** To analyze the clinical effect of peri-operative nursing for treatment of cervical spondylotic myelopathy (CSM) with anterior cervical decompression surgery for anterior cervical spine. **Method:** Select 23 cases of CSM with anterior cervical decompression surgery for anterior cervical spine conducted by the department from August 2013 to January 2015, provide pre-operative nursing, post-operative nursing and rehabilitation training, and then carry out the observation and nursing of complications. **Result:** 23 patients show good clinical effect and have no post-operative complications or nursing complications. **Conclusion:** Nurses should pay attention to the requirements for nursing at the beginning of peri-operative period for treatment of CSM with anterior cervical decompression surgery for anterior cervical spine, and take good actions to prevent all kinds of complications so as to help better improve the effect of treatment and nursing.

KEYWORDS

Cervical spine
Cervical decompression
CSM
Peri-operative period

1. Introduction

Cervical spondylotic myelopathy (CSM) is a very common orthopedics disease to middle-aged and elderly people, which causes secondary changes around cervical intervertebral disc and its soft tissues on the basis of cervical intervertebral disc degeneration, and results in the front narrowing of vertebrae tube to press cervical spinal cord, leading to a series of symptoms and signs. Anterior cervical surgery is the most effective way to treat CSM [1]. Along with the development of medical equipment and the improvement of internal fixation devices, the anterior cervical surgery can be practiced more and more reasonably. Especially in recent years, the introduction of CT and MRI and the improvement of internal fixing materials have gradually widened the range of diseases that anterior cervical surgery is applicable too [2]. Anterior cervical discectomy and fusion (ACDF) has been one of the reliable and effective methods for treating CSM at present. From August 2013 to January 2015, the department carries out the operations for treating 23 patients with CSM, and achieves great effect. Now, the experience in nursing for these patients is summarized in this paper.

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2. Clinical Data

The group has 23 cases, including 13 males and 10 females, at the average age of 48 ranging from 34 to 62 years old. Among them, there are 15 cases with the discectomy on single cervical intervertebral disc and 8 cases with the discectomy on two cervical intervertebral discs. All 23 cases have own ilium for implantation and fusion. After operation, none of them show surgical or nursing complications.

3. Pre-operative nursing

3.1. Psychological nursing

Patients with CSM have different degrees of spinal cord dysfunction and are worried about the impacts of surgery on articulation and eating and the unsatisfactory effects and pains after operation, etc. due to the special surgical position, so they may easily experience fear, anxiety and pessimism. Hence, nursing should be provided for patients based on their psychological reactions as follows: (1) Explain the necessity of surgery to patients and their families.

(2) Arrange the cured patients with CSM to tell their experienced and talk about painless operation, duration of pain after operation and methods for relieving pain, in order to make patients psychologically ready for surgery and cooperate with the treatment. (3) Explain the relations of emotions with the disease. Good mental outlook can facilitate the recovery of body, while pessimism is harmful to recovery. (4) Explain the systematic examinations in a warm, active and patient manner, tell patients the importance of mental health, and make them willing to accept the requirements of treatment and stay in hospital patiently. Patients suffering from neurosis and anxiety often dumped sorrows and discomforts to nurses and feel anxious about own disease. Nurses should tell patients about the disease to take the burden off their mind. Nurses can have one-to-one conversation with patients based on their condition and cultural background and main mental disorders. Nurses should talk affirmatively and express their opinions clearly, so as to make patients benefit from the conversation. Efforts should be made to achieve the purpose in the next conversation, in order to console patients, improve their confidence and eliminate their sorrow.

3.2. Adaptive training for surgery

3.2.1. Trachea and esophagus pushing training

This training is carried out 3–5 days before operation in the following method: A patient lies on the back with the neck slightly over the extension, and is guided to push the esophagus and trachea toward the unwounded side with index finger, middle finger and ring finger, exceeding the middle line, which lasts for 10–20 min each time, 3–4 times a day. It should not be pushed too strongly as it may cause swelling in throat. This aims to train patients for adapting to the traction of trachea and esophagus and the exposure of cervical vertebra during operation, so as to make it convenient to perform the operation and reduce the complications during and after operation.

3.2.2. Lie-down training

Lie-down training after operation is very important. When a patient lies down, he should not use too high pillow or leave the neck unsupported. The neck is fixed by sandbag on both sides. When a patient lies on his side, the pillow should be as tall as the width of shoulders to keep the neck and torso on the same line. Patients are taught to turn over themselves and understand its importance. Before operation, a suitable size of neck holder is selected, and it should be used for several days to get used to it gradually, in order to reduce the pains of patients after operation.

3.2.3. Guidance for bedridden life

Before operation, patients should practice eating while lying on the back, and must quit smoking before operation. Patients should learn how to cough correctly, do exercise for pulmonary function, chest expanding exercise of upper limbs and deep breath, etc. Patients should practice urination and defecation in a device on the bed, and their families should be guided to supervise the regular bedtime of patients, prevent their sleep in the day and wake at night. In the day, nurses should often communicate with patients, urge them to sleep early, give proper arrangement to patients if they cannot sleep at night, and not give those sleeping pills for a long time.

4. Post-operative nursing

4.1. Close attention to respiration and maintenance of smooth respiratory tract

Anterior cervical surgery causes difficulty in breathing for the following reasons: (1) The traction of trachea and esophagus during operation causes swollen pharynx; (2) The hematoma at the operated position of neck presses trachea; (3) Soar throat and blockage at neck affect the discharge of secretions from respiratory tract; (4) Surgery irritates spinal cord, which may cause swollen spinal cord or spinal nerve root, resulting in the paralysis of respiratory muscles and central dyspnea. Hence, close attention should be paid to the respiratory frequency and rhythm and complexion changes of patients after operation, and secretions of respiratory tract should be suctioned out periodically if necessary. If a patient has thick sputum and swollen larynx, the patient should receive atomized inhalation. If a patient shows fatigue, lethargy, nausea and other symptoms, attention should be paid to the incidence of sleep apnea syndrome, that is, temporary cessation or low flow of breathing during sleep. If any abnormality is discovered, it should be reported to the doctor immediately. The emergency tracheotomy instruments set should be placed at bedside for use during emergency.

4.2. Observation of changes in wound dressing and drainage

Under normal circumstances, the drainage from the cut shall be less than 100 mL within 24 h after operation. If drainage is too high and the blood is fresh, much blood is oozing from the dressing at the cut and there are local protuberances around. The neck becomes thicker and the patient feels difficult to breath. There is any sign for active hemorrhage. It should be reported to the doctor in a timely manner, and nurses should cooperate with the rescue.

4.3. Skin nursing

Patients have their body wiped with warm water twice a day. To keep clean and dry skin, nurses periodically assist patients to turn over axially. While turning a patient over, a nurse must hold the neck and two other nurses stand on both sides of the patient to ensure the axial roll and prevent the twist of spine. Nurses give massage to the bony processes, move their limbs passively, and soft pillows are placed on and under the end of sacrum, in order to prevent pressure ulcer [3]. If a patient is bedridden for a long time,

his family should give a bedpan for the patient to defecate, and keep its clean and dry, in order to prevent it from irritating and damaging the skin of the patient. Moreover, attention should be paid to cleaning the perineum after defecation by washing it with warm boiled water, in order to eliminate odor.

4.4. Observation and nursing of complications

4.4.1. Esophageal fistula

Esophageal fistula is a rare and serious complication of anterior cervical surgery. As it is directly related to the experience of surgeon and post-operative nursing, attention should be paid to this complication. If a patient feels swollen cut at the neck, pain, fever and sore throat after the anterior cervical surgery is carried out, attention must be paid to the patient. It can be diagnosed by means of X-ray film of cervical vertebra, esophagus scope and barium meal, etc. If any damage of esophagus is discovered, it must be immediately sutured, and the wound is sufficiently drained. Patients should stop eating, be fed through nasal gastric tube, have improved nutrition and control infection.

4.4.2. Leakage of cerebrospinal fluid

This is mostly caused by improper operation or too tight bonding between ossified longitudinal ligament and hard membrane. If it is not well treated, it may lead to a variety of complications. In severe cases, a patient may suffer from purulent meningitis and even his life is threatened. According to clinical observation, if the drainage is high, clean and bright after operation, there may be the leakage of cerebrospinal fluid. If leakage of cerebrospinal fluid occurs, strict neck blockage and appropriate local compression on cut should be implemented, and patients should place the head lower and the feet higher, strengthen the treatment against inflammation and prevent infection.

4.4.3. Nerve injury

The injury of superior laryngeal nerve and recurrent laryngeal nerve is the primary complication of the surgery. The injury of superior laryngeal nerve is represented by a patient's easy cough while eating fluid food or drinking water, while the injury of recurrent laryngeal nerve is represented by hoarseness, barrier of articulation and paralysis of vocal cord. During nursing, attention should be paid to observing such injury. If any symptom for injury of superior laryngeal nerve is discovered, it is necessary to eliminate the secretions of respiratory tract in a timely manner and prevent it from entering the respiratory tract. Especially, patients should be observed carefully within 48h after operation, and may receive nasal feeding if necessary.

4.4.4. Displacement and slippage of bone draft

This often occurs around 5–7 days after operation. The key to nursing is to maintain the correct body position, prevent the excessive flexion and extension of cervical vertebra, and prohibit turning. A patient should keep the neck at the middle position while lying on the back, and fix the neck with sandbag on both sides. When a patient lies on his side, the pillow should be as tall as the width of shoulders to keep the neck and body on the same line. While moving or turning a patient, the head, neck and torso must be kept on the same plane to maintain the relative stability of neck.

5. Rehabilitation training

Attention should be paid to the recovery of feelings at four limbs, and patients can be guided to do exercises for recovery of their function based on their progress of rehabilitation. On the first day after operation, the flexion and extension of muscles on the limbs can be guided. On the second day, the flexion of two lower limbs and the raise of straight legs can be exercised. If the movement of upper limbs is damaged, patients can be guided to exercise gripping for the muscles of upper limbs, and families are guided to shake hands, do hand wrestling with patients or other muscle fighting exercises, or point fingers against each other and clinch hands. Patients with paraplegia should be assisted to move their joints passively, place their limbs at the functional positions, and receive more careful skin nursing to prevent pressure ulcer.

6. Discharge guidance

(1) As the bone grafting surface after operation lacks reliable stability, bone graft may easily drop off or become loose and its healing is delayed, so false joints often occur. Especially, neck holder and other external fixation devices are used for a long time after operation till the fusion of bone graft [4]. Neck holder is worn to protect the neck and prevent the flexion or turning of neck within 3 months.

(2) If there is severe pain at the neck, difficulty in swallow and feeling of blockage, the bone graft may be displaced or slip off, the patient should go to the hospital for examination immediately.

(3) After X-ray film shows the entire fusion of intervertebral graft 3 months after operation, the functional exercise of neck can be performed. At first, the neck is bent and raised, and turned left and right. After that, the neck can turn around. The functional exercise should be performed gradually. If feeling discomfort at the neck, the exercise should be stopped for a while.

(4) Psychological guidance for families. As a patient is bedridden and depends on the nursing of family for a long time, the family may lose the patience gradually and become extraordinarily sensitive and even bored or dissatisfied with patients, which worsens the quality of patient's life and makes them bored with the life. Thus, nurses should explain to the family the harm to the condition of the patient if their feelings affect each other, and the pessimistic environment will cause the recurrence of the disease and affect the prognosis. Nurses should tell the family

that they should keep warm attitude, considerate words and conversation with the patient, making him feel the warm family and his own value. The family should be told to avoid the depression from causing the unnecessary suspension of patients, which is harmful to their physical and mental health. Nurses should encourage the family to keep positive and optimistic for providing better care for the patient.

7. Result

The 23 patients have receive good clinical effects, and the treatment and nursing have been highly recognized by patients and their families, and there are not any post-operative or nursing complications

8. Conclusion

Anterior cervical surgery is an effective method for treating cervical spondylosis at present. A large number of factors have considerable impacts on the early complications after anterior surgery [5]. As anterior cervical structure is very complicated, there are higher technical requirements for medical team. The position to be operated is surrounded by many vital organs, and is based on nerve roots of spinal cord, vertebral artery and other important organs and tissues. If the surgical complications can be reduced after operation, it will be greatly beneficial to the rehabilitation of patients. Hence, the sufficient pre-operative preparation and the delicate peri-operative nursing according to the instructions of the doctor can prevent the occurrence of various complications, and is also of great significance to the success of surgery, the life of patient and the optimal effect of treatment.

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