PERIOPERATIVE NURSING AND INTERVENTION OF POSTOPERATIVE COMPLICATIONS FOR THYROIDECTOMY

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Introduction

Most of thyroid neoplasms require surgical treatment when patients exhibit breathing and swallowing discomfort and other oppression symptoms or the tumors are suspected to have malignant transformation. However, thyroid surgery is complicated to operate. Therefore, if the preoperative preparation is inadequate, postoperative bleeding, dyspnea, nerve injury, parathyroid injury and other complications occur in the patients, more serious consequences may be caused56. Improper preoperative and postoperative treatments could directly have a serious influence on patient’s recovery and even could endanger the lives of patients, seriously affecting the quality of life6. Therefore, it is a crucial issue remaining to be solved in the nursing after thyroid surgery how to carry out complete and effective preoperative and postoperative nursing, observe the conditions, assist and cooperate with physician for treatment and aggressively handle with severe acute diseases. In this article, the medical data of 1568 patients with thyroid tumor who were admitted to our hospital from June 2008 to May 2013 were retrospectively analyzed, and the perioperative medical management mode “the integration of medical treatment and nursing” was adopted to help postoperative recovery through complete preoperative evaluation and preparation, careful postoperative nursing, precise observation of postoperative complications, close cooperation of medical treatment and nursing, thus improving the cute rate and quality of life.

ABSTRACT

Objective: To summarize the perioperative nursing intervention of thyroidectomy and experience in the integration of medical treatment and nursing.

Methods: The clinical data of 1,568 patients with thyroid tumor who were admitted in our hospital from June 2008 to May 2013 were analyzed retrospectively, and the observations and treatment of the perioperative and postoperative complications were summarized.

Results: All these 1,568 patients undergoing surgical treatment had active cooperation during the preoperative nursing and smoothly went through the perioperative period. Postoperative complications occurred in 140 patients, in which, bleeding occurred in 16 patients, dyspnea in 12 patients, shivering and fever in 2 patients, hoarseness in 33 patients, drinking cough in 32 patients, limb twitch in 21 patients and lip numb in 24 patients. All patients were then given aggressive treatment and discharged from hospital. Extubation was done in 5 intubated patients 3-7 days after the surgery, and extubation was done in 2 patients who received tracheostomy 20 days after surgery. 1 patient with dyspnea after surgery received tracheostomy, and extubation was performed after 6 months. No death occurred in these patients. All patients experienced good recovery and were free of permanent complications during a following-up period from 6 months to 5 years after surgery.

Conclusion: Postoperative recovery can be promoted if the patients are given complete preoperative evaluation and preparation, postoperative careful nursing, close observation of postoperative complications, close cooperation of medical treatment and nursing, thus improving the cute rate and quality of life.

Key words: thyroid tumor; perioperative nursing; surgical complications; integration of medical treatment and nursing; treatment.

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Clinical data and methods

General information

1,568 patients in the group (757 males and 811 females; mean age: 53.5±31.5 years) were all admitted to our department from June 2008 to May 2013, with the lesion diameter of 1.5 cm to 20 cm. Among them, 1120 patients were found to have unilateral thyroid neoplasms and 448 patients were found to have bilateral thyroid neoplasms, including 238 patients with thyroid cancer and 16 patients with chronic thyroiditis. Substernal thyroid neoplasms were seen in 48 patients, and concurrent hyperthyroidism was found in 16 patients. Relapse occurred in 28 patients after thyroidectomy. All patients received chest X-ray, electrocardiogram, thyroid function examination, neck color Doppler ultrasound and laryngoscopy conventionally before surgery. CT scan of the neck was also given to those with large thyroid neoplasms. Laryngoscopy indicated that the unilateral vocal cord fixation existed in 12 patients, and no significant vocal cord movement or abnormal closure was found in the remaining patients. The materials and methods involved in this study were approved by the ethnics committee and patients’ informed consent was obtained before study.

Clinical manifestations

All the patients were admitted to our hospital due to neck mass, which was indicated to be thyroid tumor by palpation, color Doppler ultrasound of the neck and CT scan. 501 patients did not complain of any obvious subjective symptoms. 621 patients were also accompanied by discomfort in the neck. 446 patients were also accompanied by trachea and esophagus compression which manifested as cough, dyspnea or hypoxemia, dysphagia, etc.

Surgery methods

All 1568 patients underwent surgical treatment, and peroral (or transnasal) endotracheal intubation was adopted under general anesthesia. Among them, bilateral total thyroidectomy, unilateral total thyroidectomy, unilateral subtotal thyroidectomy and bilateral subtotal thyroidectomy were performed in 186, 433, 698 and 251 patients, respectively. Neck-chest combined incision and total thyroidectomy in the affected side was made in 2 patients with huge substernal goiter.

Nursing methods

Holistic nursing was taken as the guiding thought, and the perioperative medical management mode “the integration of medical treatment and nursing” was adopted. Nurses were required to receive the preoperative evaluation, and the preoperative nursing protocol was made by the doctors and the nurses together. Thereby, the patients could receive the surgery and relieve tension. It was required that the postoperative evaluation was performed by the nurses timely and the postoperative nursing measures were implemented by the doctors and the nurses together to strengthen the observation and treatment of complications.

Results

Thyroidectomy was successfully completed in all 1568 patients with thyroid tumor, 140 patients of which exhibited postoperative complications with an incidence of 8.93% (see Table 1).

<table>
<thead>
<tr>
<th>Clinical manifestations</th>
<th>Complications</th>
<th>Number of patients with complications</th>
<th>Total number of patients</th>
<th>Proportion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleeding</td>
<td>Subcutaneous bleeding</td>
<td>3</td>
<td>1568</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>Bleeding on thyroid wounds</td>
<td>13</td>
<td>1568</td>
<td>0.83</td>
</tr>
<tr>
<td>Dyspnea</td>
<td>Hematoma compression</td>
<td>6</td>
<td>1568</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>Laryngeal edema</td>
<td>2</td>
<td>1568</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>Recurrent laryngeal nerve injury</td>
<td>4</td>
<td>1568</td>
<td>0.26</td>
</tr>
<tr>
<td>Chills and fever</td>
<td>Thyroid storm</td>
<td>2</td>
<td>1568</td>
<td>0.13</td>
</tr>
<tr>
<td>Hoarseness</td>
<td>Recurrent laryngeal nerve injury</td>
<td>33</td>
<td>1568</td>
<td>2.1</td>
</tr>
<tr>
<td>Drinking cough</td>
<td>Laryngeal nerve injury</td>
<td>32</td>
<td>1568</td>
<td>2.04</td>
</tr>
<tr>
<td>Lips numb</td>
<td>Hypocalcemia</td>
<td>24</td>
<td>1568</td>
<td>1.53</td>
</tr>
<tr>
<td>Limbs twitch</td>
<td>Hypocalcemia</td>
<td>21</td>
<td>1568</td>
<td>1.34</td>
</tr>
</tbody>
</table>

Table 1: Postoperative complications in 140 patients.

Extubation was done in 5 intubated patients 3-7 days after surgery, and extubation was done in 2 patients who received tracheostomy 20 days after the surgery. 1 patient exhibited postoperative dyspnea and tracheostomy was given, and this patient received tracheal plugging and extubation successfully 6 months after surgery. All cases were found and treated by the nurses, and no death occurred in them. During a postoperative following-up period of 6 months to 5 years, all patients experienced good recovery and were free of permanent complications. In the patients of the group, the management mode “the integration of medical treatment and nursing”...
was adopted, thus accelerating the rehabilitation of the patients and shortening the average length of stay (from 9.5 days before 2008 to 7.0 days). Therefore, the patient satisfaction improved by 4.19%. See Table 2.

<table>
<thead>
<tr>
<th>Time</th>
<th>N</th>
<th>Length of stay (days)</th>
<th>Satisfaction (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>After 2008</td>
<td>1568</td>
<td>7</td>
<td>99.31</td>
</tr>
<tr>
<td>Before 2008</td>
<td>1204</td>
<td>9.5</td>
<td>95.12</td>
</tr>
</tbody>
</table>

Table 2: Average length of stay and satisfaction.

Discussion

**Preoperative nursing**

The vital signs, physical condition, previous diseases, symptoms and signs of the patients were evaluated before surgery, and the appropriate nursing measures were formulated by the doctors and the nurses together based on the evaluation results.

**Routine preoperative nursing**

The patients were subjected to fasting for 12 hours and fasting water for 6-8 hours before surgery. Moreover, 800ml preoperative cross-matching blood was prepared for the patients with huge thyroid tumor for use. Prophylactic antibiotics were unnecessarily administered before surgery. Before surgery, the patients with secondary hyperthyroidism received oral treatment of Lugol’s iodine solution. Generally, their heart rate and BMR was controlled below 90 beats/min and < 20%-30%, respectively.

**Psychological nursing**

As for anxiety and fears in most patients before surgery, doctors and nurses should adopt the ward rounds, health education and others together to communicate with the patients, explain the circumstances of surgery and methods of cooperation, relieve tension of patients and establish a good relationship between the patients and nurses, thus contributing to smooth operation, reducing complications and improving surgical effect. The operation site and incisions should be marked by the doctors and nurses together to improve the safety of the operation (see Figure 1).

**Postural training**

Surgical postural training was performed for the patients 2 days before surgery, and the patients were also advised to start 2 hours after meal. The training was performed as follows: placing soft pillow under the shoulder and adopting hyperextension position of the neck by lying on the back, thus fully exposing the neck to the maximum tolerance of the patients. The training should be stopped immediately when discomfort occurred, and the operation time required should be gradually reached with the passage of time.

**Management of respiratory tract**

Before surgery, the patients were advised to prohibit smoking in order to reduce respiratory secretions and also taught to cough and expectorate. After the patients with tracheal compression or/and bronchospasm were given the oral treatment of 10mg dexamethasone (once per day) and 0.1g aminophylline (tid), coughs were alleviated and sputum was reduced.

**Postoperative nursing**

The patients without preoperative tracheostenosis were back to the ward conventionally when they were awake after anesthesia. The patients who suffered from tracheostenosis stayed in ICU for 1-2 days with retained endotracheal tube after surgery and were transferred to ordinary ward for treatment when they were awake after general anesthesia and could breathe steadily without the assisted mechanical ventilation.

After the patients were back to the ward after surgery, the doctors and nurses handed over and took over the treatment and nursing works together from the anesthesiologists and operating room nurses and evaluated the vital signs, anesthetic awareness, incision site, errhysis, drainage tube situation, skin integrity, etc. The postoperative nursing measures were formulated according to the conditions by the doctors and nurses and implemented in the help of the doctors and nurses.

**Routine postoperative nursing**

Tracheotomy kit was prepared at the bedside conventionally after surgery. The patients were given ECG monitoring and low-flow oxygen inhalation to observe the change of vital signs closely. Moreover, a 70°semi-reclining position was kept, and the property and quantity of drainage liquid from the wound were also observed every day. It was supposed to
inform doctors of abnormal drainage timely. Additionally, the drainage tube should be removed if the drainage volume was less than 5ml/24h (see Figure 2). During the removal of the drainage tube, the drainage tube should be prevented from being broken in the body. Moreover, the patients were encouraged to move 24h after surgery.

**Diet nursing**

Postoperative diet should be cool and not too hot to avoid overheating which could induce neck blood vessels to dilate and increase bleeding. For the patients who were able to have oral food intake, a small amount of warm water can be provided with at 4 h after surgery, and semi-liquid diet can be given if there was no discomfort in the patients (gradually transferred to a normal diet). During the patients’ diet, nurses needed to observe whether choking, aspiration or other symptoms occurred in the patients. If coughing occurred, the patients can be guided to drink a small amount of water each time. Meanwhile, the nurses should also observe whether the complications occurred. If complications were found, doctors should be informed. In the group, 2 patients with tracheomalacia were subjected to tracheotomy, and oral food intake was not convenient in these 2 patients after transnasal endotracheal intubation. Thereby, they were given removal of stomach tube after they received transnasal liquid diet for 3-7 days and were trained for oral food intake, during which no choking occurred.

**Trachea management**

It is of great significance to prevent respiratory obstruction and infection. The patients were placed in semi-recumbent position after surgery and given continuous low-flow oxygen inhalation and continuous mask oxygen inhalation if necessary, with their oxygen saturation of blood maintained around 98-100%. Daily aerosol inhalation was given routinely in order to help clearing secretion in the airway. For those patients with indwelling endotracheal tube, continuous intratracheal instillation of 0.45% saline and medicine was given, which could significantly reduce sputum formation and incidence of lung infection. In this group, one intubated patient was subjected to self-extubation at day 3 after surgery with bleeding in mucosa of nasal cavity, and blood was found in sputum at day 2 after the extubation. While this patient showed neither dyspnea and asphyxiation nor other symptoms of discomfort, and finally was cured and discharged from hospital at the 7th day after surgery. The remaining four intubated patients were given extubation 3-7 days after surgery. Two patients received tracheotomy, in whom artificial nose which was replaced once a day was used to continuously drop humidified fluid into the endotracheal tube, thus diluting sputum and helping discharge. Moreover, these 2 patients were finally given extubation 20 days after surgery (see Figure 3). One patient exhibited postoperative dyspnea and was given tracheotomy with the inner and outer tube of trachea regularly replaced.

Furthermore, good health education of the patient and their families was carried out to inform precautions in order to prevent tube slippage. Plugging of tubes was carried out six months after surgery, and extubation was performed successfully.

**Nursing of postoperative complications**

**Bleeding**

In most cases, bleeding occurred within 24 hours after surgery, which was mostly caused by halfway intra-operative hemostasis or loss of ligation. Primary nurses should take more ward rounds after surgery and observe the symptoms including whether thickened neck, subcutaneous congestion, bleeding exudation in wound dressings, sudden increase of drainage liquid in the negative-pressure drainage tube on the wound, bright red drainage and dyspnea and other symptoms of tracheal compression occurred in patients. Moreover, Primary nurses also squeezed drainage tube once within 30-60 minutes depending on the conditions in order to prevent clogging of the drainage tube. Sandbag oppression could be employed for hemostasis of mild subcutaneous hematoma, or cold compression using ice packs could be adopted to alleviate the symptoms of
bleeding. 16 patients in the group showed postoperative bleeding within 12 hours after surgery, and were also found to have black and blue neck skin, swelling neck, skin congestion, thickened neck circumference and more brightly red blood in drainage bag within short time during nursing and observation. 3 patients received opening incision for hemorrhage in the ward. 13 patients received opening incision and removal of hematoma under general anesthesia, followed by suturing the wound for hemostasis after finding hemorrhagic spots on the thyroid wounds. No serious consequences were found (Figure 4). One patient with dyspnea was given wound opening at the bedside for hemostasis and then discharged normally four days after surgery. In the recent two years, the combined application of intraoperative ultrasound knife can contribute to an effective and safe hemostasis, thus shortening operation time and reducing complications\(^6\)\(^7\).

**Fig. 4**: Cyanosis and swelling of neck skin(A); hematoma in the incision(B).

**Dyspnea**

In most cases, dyspnea was induced by bilateral recurrent laryngeal nerve (RLN) injury, hematoma compression, laryngeal edema, tracheal collapse or so forth. Conventionally, sterile tracheotomy kit and sterile gloves were prepared at the bedside after surgery. According to the patient’s condition and level of nursing, timely inspections of wards were carried out to observe whether dyspnea, cyanosis, irritability and other kinds of discomfort with thickened neck circumference, decrease in oxygen saturation, expectoration and sputum tone occurred. In 1568 patients, dyspnea occurred in 12 patients. Among them, 1 patient with bleeding exhibited dyspnea and was improved after receiving debridement and hemostasis in the operation room. When it was found that 1 patient showed dyspnea due to hematoma compression of the trachea resulting from the blood clots-induced clogging of drainage tube by nurses, the drainage tube was timely adjusted and flushed to quickly remove hematoma, thus avoiding reoperation. 1 patient was saved after timely tracheotomy due to severe dyspnea.

**Hoarseness and drinking cough**

Hoarseness and drinking cough are often induced by injury of laryngeal nerve and recurrent nerve\(^8\). After surgery, the patients were encouraged to speak, and observed to find whether there were some symptoms including hoarseness, aphonia, dyspnea, tone lowering, drinking cough and so forth. The patients were also guided to drink a small amount of water each time and to speak gradually when they were awake after anesthesia. In the group, hoarseness occurred in 33 patients, in which, postoperative transient hoarseness occurred in 22 patients and alleviated after intravenous infusion of dexamethasone for 3 days, while hoarseness was improved completely in the remaining 11 patients within 6-12 months after surgery. 32 patients had drinking cough and were returned to normal within 1-3 days after surgery.

**Limb twitch and lip numb**

Limb twitch and lip numb are often caused by parathyroid damage\(^9\). Most of them were induced by inadvertent intraoperative damage, parathyroid resection or surgery-induced damage of parathyroid blood supply. The patients were observed to find whether they showed limb twitch and acupuncture numbness in face, lips and limbs in the patients after surgery. In the group, limbs twitch and limbs numb occurred in 21 patients and 24 patients, respectively. Among them, one patient had severe symptoms, in whom blood calcium concentration was 1.58mmol/L by emergent monitoring and low calcium was also indicated by ECG. Then, this patient showed improved condition after intravenous injection of 10% calcium gluconate following medical directions, and subsequently returned to normal after the oral and intravenous treatment of calcium supplements.

**Shivering and fever**

Belonging to symptoms of thyroid storm, shivering and fever mostly occurred within 12 h-36 h after surgery. Generally, the patients showed fever, irritability, delirium, sweating, vomiting and so forth and can exhibit coma, shock and even death if they were not promptly treated\(^10\). After surgery, the patients should be monitored for changes in vital signs, and observation of condition should also be strengthened. Two patients in the group exhibited postoperative temperature above 40°C and heart rate at 120 beats / min or more. After the doctors were informed, the patients were immediately given the
treatments of oxygen, cooling, sedation, oral intake of iodine, intravenous injection of hydrocortisone, and were finally returned to normal within 1-3 days after surgery.

Conclusion

Due to special anatomical position of the thyroid gland, postoperative bleeding, dyspnea, parathyroid injury, nerve injury, thyroid storm and other complications are common if improper operation occurs during perioperative period. Therefore, observation and nursing during perioperative period is very crucial for preventing postoperative complications. With the rehabilitation nursing of integrated medical treatment and nursing performed during perioperative period in the 1568 patients in the group, the whole process of treatment is made seamless so as to implement completely all nursing services, strengthen perioperative treatment for the patients with thyroid tumors and improve their prognosis. Thereby, the patients obtain an accelerated rehabilitation process, improved medical quality and increased satisfaction.

References


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